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Sixth Grade				
Unit / Core Text	**Essential Questions**	**Academic Vocabulary**	**Embedded Assessments**	**Unit Goals**
Unit 1 **Stories of Change**	What makes a good story? How can change be significant?	paraphrase summarize synonym antonym sequence cause-effect analyze transitions coherence	EA 1: Writing a Personal Narrative EA 2: Writing a Short Story	• To understand how change can be significant. • To analyze key ideas and details in addition to craft and structure in print and non-print texts • To use narrative techniques such as sequencing, dialogue, and descriptive language • To write narratives to develop real or imagined events • To understand pronouns and the conventions of punctuating dialogue
Unit 2 **The Power to Change** ***Walk Two Moons*** **(Novel)** **Temple Grandin** **(Film)**	How can talking and working with others help one analyze a novel? How do internal and external forces help people grow?	reflection compare-contrast inference prediction communication (verbal/nonverbal) synthesize	EA 1: Responding to Literature EA 2: Writing an Expository Essay	• To analyze literary elements • To apply a variety of reading strategies to fiction and nonfiction texts • To collaborate and communicate effectively • To write an expository essay • To practice using verb tenses and creating sentence variety
Unit 3 **Changing Perspectives**	Why do we have controversy in society? How do we communicate in order to convince others?	controversy argument claim reasons evidence research citation textual evidence credible relevant sufficient	EA 1: Researching and Debating a Controversy EA 2: Writing an Argumentative Letter	• To analyze informational texts • To practice nonfiction reading strategies • To support a claim with reasons and evidence • To engage effectively in a variety of collaborative discussions • To write an argumentative letter • To understand and use simple, compound, and complex sentence structures
Unit 4 **The Final Act** **The Taming of the Shrew (excerpts)** **(Drama)**	How can research shape one's understanding of a literary text? How is reading a text similar to and different from viewing and performing a text?	collaborate source multimedia bibliography evaluate synthesize annotate	EA 1: Researching and Presenting Shakespeare EA 2: Presenting Shakespeare	• To analyze and understand the relationship among setting, characterization, conflict, and plot • To research a drama from a different time period • To rehearse and present an engaging performance of a drama • To revise for effective sentence variety

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Seventh Grade				
Unit / Core Text	**Essential Questions**	**Academic Vocabulary**	**Embedded Assessments**	**Unit Goals**
Unit 1 **The Choices We Make**	How do authors use narrative elements to create a story? What are the elements of effective revision?	effect effective consequences coherence internal coherence external coherence theme metaphor objective subjective	EA 1: Revising a Personal Narrative about Choice EA 2: Creating an Illustrated Myth	▪ To analyze genres and their organizational structures ▪ To examine the function of narrative elements ▪ To apply revision techniques in preparing drafts for publication ▪ To apply techniques to create coherence and sentence variety in writing
Unit 2 **What Influences My Choices?**	What role does advertising play in the lives of youth? What makes an effective argument?	claim consensus counterclaim credibility hypothesize inference primary source secondary source search term text features valid norm	EA 1: Writing an Expository Essay and Participating in a Collaborative Discussion EA 2: Writing an Argumentative Essay	• To understand how our lives are affected by media and advertising • To engage in collaborative discussions • To write an expository essay • To identify and analyze the use of appeals, language, and rhetorical devices in informational and argumentative texts • To write an argumentative essay
Unit3 **Choices and Consequences** ***Tangerine* (Novel)**	What is the relationship between choices and consequences? What makes a great leader?	annotated bibliography interpret perspective subordinate	EA 1: Writing an Literary Analysis Essay EA 2: Creating a Biographical Presentation	• To use textual evidence to support analysis and inferences • To write a literary analysis essay • To evaluate, analyze, and synthesize a variety of informational texts • To create and present a biographical research project
Unit 4 **How We Choose to Act** **Twelfth Night (Drama)**	How do writers and speakers use language for effect? How do performers communicate meaning to an audience?	precise structure modify romantic realistic improvise represent diagram	EA 1: Creating and Presenting a Monologue EA 2: Performing a Shakespearean Dialogue	• To increase textual analysis skills across genres • To strengthen verbal and nonverbal communication skills • To improve oral fluency and presentation skills • To collaborate on a Shakespearean performance

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Eighth Grade				
Unit / Core Text	**Essential Questions**	**Academic Vocabulary**	**Embedded Assessments**	**Unit Goals**
Unit 1 **The Challenge of Heroism**	What defines a hero? How does the Hero's Journey archetype appear in stories throughout time?	context technique synonyms antonyms concise function negation	EA 1: Writing a Hero's Journey Narrative EA 2: Writing a Definition Essay	• To create an original illustrated narrative based on the Hero's Journey archetype • To analyze and synthesize a variety of texts to develop an original definition of *hero* • To analyze and evaluate expository texts for ideas, structure, and language • To develop expository texts using strategies of definition
Unit 2 **The Challenge of Utopia** ***The Giver* or *Fahrenheit 451*** **(Novel)**	To what extent can a perfect society exist? What makes an argument effective?	compare/contrast utopia dystopia universal seminar Socratic argument debate controversy research search terms	EA 1: Writing an Expository Essay EA 2: Writing an Argumentative Essay	• To analyze a novel for archetype and theme • To analyze and evaluate a variety of expository and argumentative texts for ideas, structure, and language • To develop informative/explanatory texts using the compare/contrast organizational structure • To understand the use of active voice and passive voice • To develop effective arguments using logical reasoning, relevant evidence, and persuasive appeals for effect
Unit 3 **The Challenge to Make a Difference** **Novels of the Holocaust**	Why is it important to learn about the Holocaust? How can one person make a difference?	communication resume' euphemism slogan media media channels target audience evaluate	EA 1: Presenting Voices of the Holocaust EA 2: Presenting a Multimedia Campaign	• To engage effectively in a range of collaborative discussions • To analyze the development of a theme or central idea of a text • To research an issue of national or global significance • To create an informative and persuasive multimedia presentation • To strengthen writing through the effective use of voice and mood
Unit 4 **The Challenge of Comedy** ***A Midsummer Night's Dream*** **(Drama)**	How do writers and speakers use humor to convey truth? What makes an effective performance of a Shakespearean comedy?	juxtaposition caricature derision denounce	EA 1: Writing an Analysis of a Humorous Text EA 2: Performing Shakespearean Comedy	• To analyze how a variety of authors create humor in print and non-print texts • To analyze how humor is used to reveal a universal truth (theme) • To write a well-developed analysis of a humorous text • To analyze and perform a scene from a Shakespearean comedy • To understand verbals and how they are used in writing

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Ninth Grade

Unit / Core Text	Essential Questions	Academic Vocabulary	Embedded Assessments	Unit Goals
Unit 1 **Coming of Age** ***Independent reading novels*** **(Novel)**	What does it mean to "come of age"? How are rhetorical appeals used to influence an audience?	strategize inference denotation connotation transcript claim counterclaim analogy	EA 1: Writing and Presenting an Interview Narrative EA 2: Writing an Argumentative Essay	▪ To understand the concept of coming of age ▪ To identify diction, syntax, imagery, and tone--and to understand the way they work together to convey an author's or speaker's voice ▪ To incorporate voice effectively in one's own writing ▪ To support an inference or claim using valid reasoning and relevant and sufficient evidence ▪ To analyze and use rhetorical appeals and evidence to present an argument to an audience
Unit 2 **Defining Style** ***Edward Scissorhands*** **(Film)**	What makes a good story? What are the elements of a style analysis?	verify commentary textual commentary textual evidence	EA 1: Writing a Short Story EA 2: Writing a Style Analysis Essay	▪ To identify specific elements of an author's style ▪ To develop close reading skills ▪ To review and analyze elements of fiction and write a short story ▪ To identify cinematic techniques and analyze their effects ▪ To analyze syntactical structure and use clauses to achieve specific effects
Unit 3 **Coming of Age in Changing Times** ***To Kill a Mockingbird*** **(Novel)**	What impact does context have on a novel and on the reactions of readers to it? How does a key scene from a novel contribute to the work as a whole?	context primary source secondary source plagiarize parenthetical citations valid rhetoric annotated bibliography censor censorship evaluate	EA 1: Historical Investigation and Presentation EA 2: Writing a Literary Analysis Essay	▪ To gather and integrate relevant information from multiple sources in order to answer research questions ▪ To present findings clearly, concisely, and logically, making strategic use of digital media ▪ To analyze how literary elements contribute to the development of a novel's themes ▪ To write a literary analysis, citing textual evidence to support ideas and inferences
Unit 4 **Exploring Poetic Voices** ***Selected Poems***	What is Poetry? What can a writer learn from studying an author's craft and style?	complementary emulate interpretation oral interpretation elaborate (v.)	EA 1: Creating a Poetry Anthology EA 2: Analyzing and Presenting a Poet	▪ To develop the skills and knowledge to analyze and craft poetry ▪ To analyze the function and effects of figurative language ▪ To write original poems that reflect personal voice, style, and an understanding of poetic elements ▪ To write a style analysis essay ▪ To present an oral interpretation of a poem
Unit 5 **Coming of Age on Stage** ***Romeo and Juliet*** **(Drama)**	How do actors and directors use theatrical elements to create a dramatic interpretation? Why do we study Shakespeare?	vocal delivery visual delivery argument claim evidence synthesis counterclaim concession refutation hook concluding statement call to action	EA 1: Presenting a Dramatic Interpretation EA 2: Writing a Synthesis Argument	▪ To cite textual evidence to support analysis of a dramatic text ▪ To analyze the representation of key scenes in text, film, and other mediums ▪ To collaborate with peers on an interpretive performance ▪ To conduct research to answer questions and gather evidence ▪ To analyze how an author uses rhetoric to advance a purpose ▪ To write an argument to support a claim

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Tenth Grade				
Unit / Core Text	**Essential Questions**	**Academic Vocabulary**	**Embedded Assessments**	**Unit Goals**
Unit 1 **Cultural Conversations**	How do cultural experiences shape, impact, or influence our identity and perceptions? How do we synthesize multiple sources of information into a cohesive argument?	synthesis perspective argument claim counterclaim concession refutation	EA 1: Writing About Cultural Identity EA 2: Writing a Synthesis Paper	• To analyze how culture affects identity and perceptions • To practice effective speaking and listening skills that build capacity for collaboration and communication • To analyze the concept of voice in reading and writing • To examine and apply the elements of argument • To analyze and apply syntactic structures in writing
Unit 2 **Cultural Perspectives**	How can cultural experiences and perspectives be conveyed through memorable narratives? What issues resonate across cultures, and how are arguments developed in response?	stereotype artifact allusion empirical evidence logical evidence anecdotal evidence fallacy	EA 1: Writing a Narrative EA 2: Creating an Argument	• To construct a narrative that recounts issues of cultural identity • To recognize the role that culture plays in defining ourselves as individuals • To examine perspectives of justice across cultures and over time • To understand and apply the elements of argument • To develop an argument on an issue for a specific audience, using an effective genre
Unit 3 **Cultures in Conflict** ***Things Fall Apart*** **(Novel)**	How might a culture change when it encounters new ideas and members? How can an author use a fictional character to make a statement about culture?	reliability validity plagiarism annotated bibliography	EA 1: Researching and Comparing Pre- and Post-Colonial Ibo Culture EA 2: Writing a Literary Analysis Essay	• To analyze cultural experiences reflected in a work of literature from outside the United States • To analyze how complex characters in a novel develop and interact to advance a plot or theme • To research to answer questions, explore complex ideas, and gather relevant information • To present findings to an audience clearly and logically, making use of digital media • To draw evidence from a literary text to support analysis and reflection
Unit 4: **Dramatic Justice** **Antigone** **(Drama)**	How can one communicate characterization through oral interpretations? How do complex characters advance the plot and develop the themes of a drama?	justice criteria advance (v)	EA1: Presenting an Oral Interpretation of Literature EA2: Writing a Literary Analysis Essay on Characterization and Theme	• To evaluate and critique oral interpretations • To analyze characterization, conflicting motivations of a complex character, and major themes in a classic Greek drama • To analyze point of view and cultural experience reflected in literature from outside the United States • To analyze and present an oral interpretation of a monologue conveying a complex character's voice • To write a literary analysis essay examining the development of a tragic hero and the development of plot and theme
Unit 5: **Building Cultural Bridges** ***The 11th Hour*** **(Film)**	How do cultural differences contribute to conflicts over environmental issues? In what ways do nonfiction texts influence perceptions of their subject?	controversial documentary imperative fallacies refutation stakeholder advocate objective subjective	EA 1: Presenting a Solution to an Environmental Conflict EA 2: Representing an Argument in a Documentary Film	• To examine how nonfiction texts (both print and non-print) construct our perceptions of what is true • To analyze how writers and speakers use evidence and appeals to support a claim • To examine the credibility of a text or its author • To explore a complex issue or problem from multiple perspectives and to work with peers to present a solution • To use media strategically to enhance a presentation

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Poetry: "Prayer to the Masks," by Léopold Sedar Senghor **Poetry:** "The Second Coming," by William Butler Yeats	

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Eleventh Grade				
Unit / Core Text	**Essential Questions**	**Academic Vocabulary**	**Embedded Assessments**	**Unit Goals**
Unit 1 **The American Dream**	What is the "American Dream"? How do writers use the strategies of definition to define a concept?	Primary Source Defend Structure Challenge Qualify	EA 1: Writing a Definition Essay EA 2: Synthesizing the American Dream	• To understand and define complex concepts such as the American Dream • To identify and synthesize a variety of perspectives • To analyze and evaluate the effectiveness of arguments • To analyze representative texts from the American experience
Unit 2 **The Power of Persuasion** ***The Crucible*** **(Drama)**	How can artistic expression advance social commentary? How are the components of rhetoric applied to the creation and delivery of persuasive speeches?	Rhetoric Social Commentary Historical Context Rhetorical Context Vocal Delivery	EA 1: Creating and Performing a Dramatic Scene EA 2: Writing and Presenting a Persuasive Speech	▪ To interpret a text in consideration of its context ▪ To analyze an argument ▪ To create and present a dramatic scene about a societal issue ▪ To define and apply the appeals and devices of rhetoric ▪ To analyze, write, and present a persuasive speech ▪ To examine and apply syntactic structures in the written and spoken word
Unit 3 American Forums: The Marketplace of Ideas	How do news outlets impact public opinion or public perception? How does a writer use tone to advance an opinion?	Reasoning Evidence Bias Editorial Fallacies Parody Caricature	EA 1: Creating an Op-Ed News Project EA 2: Writing a Satirical Piece	• To analyze and create editorial and opinion pieces • To identify and analyze fallacious reasoning in a text • To analyze how writers use logic, evidence, and rhetoric to advance opinions • To define and apply the appeals and devices of rhetoric • To analyze and apply satirical techniques • To examine and apply syntactic structures in the written and spoken word
Unit 4 **The Pursuit of Happiness** ***Into the Wild*** **(Biography)**	What does it mean to pursue happiness? How can a writer use/manipulate genre conventions for effect?	Genre Conventions	EA 1: Writing a Personal Essay EA 2: Writing a Multi-Genre Research Project	• To analyze and evaluate the structural and stylistic features of texts • To compose a personal essay that employs stylistic techniques • To use a variety of genres to express a coherent theme
Unit 5 **An American Journey** ***Their Eyes Were Watching God*** **(Novel)**	How do cultural movements such as the Harlem Renaissance reflect and create people's attitudes and beliefs? How is one writer's work both a natural product of and a departure from the ideas of a specific literary movement in American literature?	Renaissance Annotated Bibliography	EA 1: Presenting a Literary Movement: The Harlem Renaissance EA 2: Creating an Analytical Essay	• To explore the concept of "journey" • To analyze a writer's complex writing and stylistic choices • To research and synthesize information about a literary era • To create a multimedia presentation

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Senior English

Unit / Core Text	Essential Questions	Academic Vocabulary	Embedded Assessments	Unit Goals
Unit 1 Perception is Everything	How do artists and writers organize or construct art or text to convey meaning? What does it mean to be a stranger in the village?	aphorism perception perspective scenario marginalize dominant subordinate imperialism	EA 1: Creating an Argumentative Photo Essay EA 2: Writing a Reflective Essay	• To examine the relationship between perspective and critical theory • To analyze and apply critical theories to various texts studied and created • To control and manipulate textual elements in writing to clearly and effectively convey a controlling idea or thesis • To use punctuation and syntax to create meaning and effect in writing
Unit 2 **The Collective Perspective** ***Pygmalion*** **(Drama)**	How does applying a critical perspective affect an understanding of text? How does a new understanding gained through interpretation help or hinder your enjoyment of a text?	enfranchisement patriarchal archetypes Archetypal Criticism artistic license Marxist Criticism Feminist Criticism montage	EA 1: Illuminating *Pygmalion* EA 2: Applying a Critical Perspective	• To enhance critical thinking by studying Feminist, Marxist, and Archetypal critical perspectives • To apply multiple critical perspectives to drama, nonfiction, and non-print texts • To use the writing process to create an engaging script and an insightful analytical response • To use a variety of organizational and rhetorical strategies for different modes of writing
Unit 3 **Evolving Perspectives** ***Othello*** **(Drama)**	What role does literature play in the examination of recurring social issues? How can a dramatic performance reflect a critical perspective?	Scenario Historical Criticism	EA 1: Writing an Argument EA 2: Staging an Interpretation	• To analyze multiple interpretations of a Shakespearean tragedy • To examine critical perspectives as they apply to the drama • To plan and perform dramatic interpretations of selected scenes • To analyze the ways in which historical contexts have influenced performances of the play • To analyze the use of meter and rhythm in poetry and in the play
Unit 4 **Creating Perspectives**	How do media sources influence our understanding of the truth and significance of an issue? How are media texts constructed to support an agenda or interpretation?	agenda media media channel documentary film primary footage archival footage synthesize conventions	EA 1: Examining How an Issue is Presented in Media Texts EA 2: Creating a Documentary Media Text	• To evaluate media as an information source • To investigate a variety of perspectives on a single event • To analyze how different critical perspectives shape the reporting and interpreting of events • To create a media text applying multiple lenses to the investigation and representation of an event • To analyze the integration of quotations and their effect on the reader
Unit 5 **Multiple Perspectives** ***The Arrival*** **(Graphic Novel)**	How can an examination of text through multiple perspectives affect understanding? How do media production elements shape a message?	culture	EA: Presenting a Literary Work Through Multiple Critical Perspectives	• To trace a reading through a critical perspective over the course of an extended text • To analyze two literary works through multiple critical perspectives • To analyze and then use text features of a graphic novel • To create a presentation using a performance-based or visual medium • To identify parataxis and use it for effect

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Sixth Grade				
Unit / Core Text	**Essential Questions**	**Academic Vocabulary**	**Embedded Assessments**	**Unit Goals**
Unit 1 **Stories of Change**	What makes a good story? How can change be significant?	paraphrase summarize synonym antonym sequence cause-effect analyze transitions coherence	EA 1: Writing a Personal Narrative EA 2: Writing a Short Story	• To understand how change can be significant. • To analyze key ideas and details in addition to craft and structure in print and non-print texts • To use narrative techniques such as sequencing, dialogue, and descriptive language • To write narratives to develop real or imagined events • To understand pronouns and the conventions of punctuating dialogue
Unit 2 **The Power to Change** ***Walk Two Moons*** **(Novel)** **Temple Grandin** **(Film)**	How can talking and working with others help one analyze a novel? How do internal and external forces help people grow?	reflection compare-contrast inference prediction communication (verbal/nonverbal) synthesize	EA 1: Responding to Literature EA 2: Writing an Expository Essay	• To analyze literary elements • To apply a variety of reading strategies to fiction and nonfiction texts • To collaborate and communicate effectively • To write an expository essay • To practice using verb tenses and creating sentence variety
Unit 3 **Changing Perspectives**	Why do we have controversy in society? How do we communicate in order to convince others?	controversy argument claim reasons evidence research citation textual evidence credible relevant sufficient	EA 1: Researching and Debating a Controversy EA 2: Writing an Argumentative Letter	• To analyze informational texts • To practice nonfiction reading strategies • To support a claim with reasons and evidence • To engage effectively in a variety of collaborative discussions • To write an argumentative letter • To understand and use simple, compound, and complex sentence structures
Unit 4 **The Final Act** **The Taming of the Shrew (excerpts)** **(Drama)**	How can research shape one's understanding of a literary text? How is reading a text similar to and different from viewing and performing a text?	collaborate source multimedia bibliography evaluate synthesize annotate	EA 1: Researching and Presenting Shakespeare EA 2: Presenting Shakespeare	• To analyze and understand the relationship among setting, characterization, conflict, and plot • To research a drama from a different time period • To rehearse and present an engaging performance of a drama • To revise for effective sentence variety

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KEY TEXTS Texts representative of themes and rigorous reading experiences in the level (Note: this is just a sample of the texts included in the level)		**STRATEGIES FOCUS** Explicit teaching of effective strategies that provide scaffolding for all students while moving toward independent learning
Personal Narrative:	"The Jacket," by Gary Soto	• Close Reading • QHT • Marking the Text • Adding by Looping • Deleting • Double Entry Journal • Questioning the Text • Literature Circles • Replacing • Diffusing • Paraphrasing • Re-reading • Metacognitive Markers • Drama Games • Oral Interpretation • Choral Reading
Novel:	Excerpt from Kira-Kira, by Cynthia Kadohata	
Short Story:	"Thank You, M'am," by Langston Hughes "Eleven," from *Woman Hollering Creek and Other Stories* by Sandra Cisneros	
Novel:	*Walk Two Moons,* by Sharon Creech	
Memoir:	Excerpt from *Travels with Charley,* by John Steinbeck	
News Column:	"Saying Farewell to a Faithful Pal," by John Grogan	
Film Biography:	*Temple Grandin*	
Autobiography:	"My Story" from *Animals in Translation,* by Temple Grandin and Catherine Johnson	
Editorial:	"Don't ban peanuts at school, but teach about the dangers," by Register Editorial Board	**LANGUAGE AND WRITER'S CRAFT** Instruction that provides grammar support and instruction in the context of actual reading and writing
News Article:	"Penny Problem: Not Worth Metal It's Made Of," by Yunji de Nies	
Historical Document:	"Letter on Thomas Jefferson," by John Adams (1776)	• Transitions • Revising for Transitions • Vivid Verbs • Varied Sentence Patterns • Pronoun Usage and Agreement • Sentence Variety • Revising for Figurative Language • Parallel Structure • Formal Style • Using Appositives • Revising by Creating Complex Sentences • Choosing Sentence Structure • Pronoun Usage
Letter:	"The First Americans," by Scott H. Peters, the Grand Council Fire of American Indians	
Essay:	Excerpts from The Folger Shakespeare Library's *The Taming of the Shrew* : "*The Taming of the Shrew*: A Modern Perspective," by Karen Newman; "Shakespeare's Life," by Barbara A. Mowat and Paul Werstine	
Poem:	"Oranges," by Gary Soto "Jabberwocky," by Lewis Carroll "Fireflies," by Paul Fleishman	
Drama:	"The Millionaire Miser," by Aaron Shepard Excerpts from *The Taming of the Shrew,* by William Shakespeare	
Film:	*The Taming of the Shrew,* directed by Franco Zeffirelli, 1967	

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Seventh Grade				
Unit / Core Text	**Essential Questions**	**Academic Vocabulary**	**Embedded Assessments**	**Unit Goals**
Unit 1 **The Choices We Make**	How do authors use narrative elements to create a story? What are the elements of effective revision?	effect effective consequences coherence internal coherence external coherence theme metaphor objective subjective	EA 1: Revising a Personal Narrative about Choice EA 2: Creating an Illustrated Myth	▪ To analyze genres and their organizational structures ▪ To examine the function of narrative elements ▪ To apply revision techniques in preparing drafts for publication ▪ To apply techniques to create coherence and sentence variety in writing
Unit 2 **What Influences My Choices?**	What role does advertising play in the lives of youth? What makes an effective argument?	claim consensus counterclaim credibility hypothesize inference primary source secondary source search term text features valid norm	EA 1: Writing an Expository Essay and Participating in a Collaborative Discussion EA 2: Writing an Argumentative Essay	• To understand how our lives are affected by media and advertising • To engage in collaborative discussions • To write an expository essay • To identify and analyze the use of appeals, language, and rhetorical devices in informational and argumentative texts • To write an argumentative essay
Unit3 **Choices and Consequences** ***Tangerine* (Novel)**	What is the relationship between choices and consequences? What makes a great leader?	annotated bibliography interpret perspective subordinate	EA 1: Writing an Literary Analysis Essay EA 2: Creating a Biographical Presentation	• To use textual evidence to support analysis and inferences • To write a literary analysis essay • To evaluate, analyze, and synthesize a variety of informational texts • To create and present a biographical research project
Unit 4 **How We Choose to Act** **Twelfth Night (Drama)**	How do writers and speakers use language for effect? How do performers communicate meaning to an audience?	precise structure modify romantic realistic improvise represent diagram	EA 1: Creating and Presenting a Monologue EA 2: Performing a Shakespearean Dialogue	• To increase textual analysis skills across genres • To strengthen verbal and nonverbal communication skills • To improve oral fluency and presentation skills • To collaborate on a Shakespearean performance

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KEY TEXTS Texts representative of themes and rigorous reading experiences in the level (Note: this is just a sample of the texts included in the level)	
Poetry:	"The Road Not Taken," by Robert Frost
Poem:	"Choices," by Nikki Giovanni
Autobiography:	Excerpt from *Dust Tracks on a Road,* by Zora Neale Hurston
Personal Narrative:	"Why Couldn't I Have Been Named Ashley?" By Imma Achilike
Myth:	"Daedalus and Icarus," from *Greek Myths* by Geraldine McCaughrean
Informational Text :	"A Note from the Author," by Virginia Hamilton
Myth:	"Huveane and Clay People," from *Voices of the Ancestors: African Myth,* by Tony Allan, Fergus Fleming, and Charles Phillips
Informational Text:	"Facts About Marketing to Children," The Center for a New American Dream
Article:	"Marketing to kids gets more savvy with new technologies"
Essay:	"America the Not-So-Beautiful," by Andrew A. Rooney
Informational Text:	"Another study highlights the insanity of selling junk food in school vending machines," by Karen Kaplan
Speech:	"Ain't I a Woman?" by Sojourner Truth
Speech:	"Remarks to the U.N. 4th World Conference on Women Plenary Session" (excerpt), by Hillary Rodham Clinton
Novel:	*Tangerine*, by Edward Bloor
Biography:	Nobel Peace Prize Biography of Nelson Mandela
Autobiography:	Excerpt from *Long Walk to Freedom* by Nelson Mandela
Poetry:	"Invictus" by William Ernest Henley
Speech:	Nelson Mandela's Nobel Peace Prize Acceptance Speech
Poetry:	"Stopping by Woods on a Snowy Evening," by Robert Frost
Poetry:	"maggie and milly and molly and may," by E.E. Cummings
Monologue:	"Eye Contact," by Deborah Karczewski
Drama:	*Twelfth Night,* by William Shakespeare
Film:	*Twelfth Night*, directed by Trevor Nunn, 1996

STRATEGIES FOCUS

Explicit teaching of effective strategies that provide scaffolding for all students while moving toward independent learning

- Metacognitive Markers
- Looping
- Diffusing
- SOAPSTone
- Questioning the Text
- SIFT
- Choral Reading
- RAFT

LANGUAGE AND WRITER'S CRAFT

Instruction that provides grammar support and instruction in the context of actual reading and writing

- Verb Tenses
- Creating Coherence and Sentence Variety
- Analogies
- Coherence
- Punctuating Coordinate Adjectives
- Pronouns and Antecedents
- Revising for Cohesion and Clarity
- Revising for Precise Language and Formal Style
- Sentence Variety
- Sentence Structure and Transitions
- Using Rhetorical Devices
- Phrases and Clauses
- Revising with Subordinate Clauses
- Revising with Coordinating Conjunctions
- Understanding Phrases
- Active versus Passive Voice
- Analogies
- Adjectival and Prepositional Phrases
- Dangling and Misplaced Modifiers
- Varying Syntax for Effect

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Eighth Grade				
Unit / Core Text	**Essential Questions**	**Academic Vocabulary**	**Embedded Assessments**	**Unit Goals**
Unit 1 **The Challenge of Heroism**	What defines a hero? How does the Hero's Journey archetype appear in stories throughout time?	context technique synonyms antonyms concise function negation	EA 1: Writing a Hero's Journey Narrative EA 2: Writing a Definition Essay	• To create an original illustrated narrative based on the Hero's Journey archetype • To analyze and synthesize a variety of texts to develop an original definition of *hero* • To analyze and evaluate expository texts for ideas, structure, and language • To develop expository texts using strategies of definition
Unit 2 **The Challenge of Utopia** ***The Giver* or *Fahrenheit 451*** **(Novel)**	To what extent can a perfect society exist? What makes an argument effective?	compare/contrast utopia dystopia universal seminar Socratic argument debate controversy research search terms	EA 1: Writing an Expository Essay EA 2: Writing an Argumentative Essay	• To analyze a novel for archetype and theme • To analyze and evaluate a variety of expository and argumentative texts for ideas, structure, and language • To develop informative/explanatory texts using the compare/contrast organizational structure • To understand the use of active voice and passive voice • To develop effective arguments using logical reasoning, relevant evidence, and persuasive appeals for effect
Unit 3 **The Challenge to Make a Difference** **Novels of the Holocaust**	Why is it important to learn about the Holocaust? How can one person make a difference?	communication resume' euphemism slogan media media channels target audience evaluate	EA 1: Presenting Voices of the Holocaust EA 2: Presenting a Multimedia Campaign	• To engage effectively in a range of collaborative discussions • To analyze the development of a theme or central idea of a text • To research an issue of national or global significance • To create an informative and persuasive multimedia presentation • To strengthen writing through the effective use of voice and mood
Unit 4 **The Challenge of Comedy** ***A Midsummer Night's Dream*** **(Drama)**	How do writers and speakers use humor to convey truth? What makes an effective performance of a Shakespearean comedy?	juxtaposition caricature derision denounce	EA 1: Writing an Analysis of a Humorous Text EA 2: Performing Shakespearean Comedy	• To analyze how a variety of authors create humor in print and non-print texts • To analyze how humor is used to reveal a universal truth (theme) • To write a well-developed analysis of a humorous text • To analyze and perform a scene from a Shakespearean comedy • To understand verbals and how they are used in writing

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KEY TEXTS Texts representative of themes and rigorous reading experiences in the level (Note: this is just a sample of the texts included in the level)	
Novel Excerpt:	*A Wrinkle in Time,* by Madeleine L'Engle
Short Story:	"The Drummer Boy of Shiloh," by Ray Bradbury
Narrative Poetry:	From the *Odyssey*, by Homer
Poetry:	"Sonnet 116," by William Shakespeare
Poetry:	"O Captain! My Captain!," by Walt Whitman
Funeral Sermon:	"On the Death of Abraham Lincoln," by Dr. Phineas D. Gurley
Essay:	"Grant and Lee: A Study in Contrasts," by Bruce Catton
Short Story:	"Harrison Bergeron," by Kurt Vonnegut, Jr.
Novel:	The Giver, by Lois Lowry
Novel:	Fahrenheit 451, by Ray Bradbury
Article:	"Cellphones and driving: As dangerous as we think?" by Matthew Walberg
Memoir:	Excerpt from *Night,* by Elie Wiesel
Speech:	from Elie Wiesel's Nobel Peace Prize Acceptance Speech
Informational Text:	from *Do Something! A Handbook for Young Activists*
Article:	"Famine as a Weapon: It's Time to Stop Starvation in Sudan" by George Clooney and John Prendergast
Essay:	"I've got a few pet peeves about sea creatures," by Dave Barry
Poetry :	"They Have Yarns," by Carl Sandburg
Film:	*A Midsummer Night's Dream*
Play:	Excerpts from *A Midsummer Night's Dream,* by William Shakespeare

STRATEGIES FOCUS

Explicit teaching of effective strategies that provide scaffolding for all students while moving toward independent learning

- Self Editing
- Peer Editing
- TP-CASTT
- Free Writing
- Socratic Seminar
- Fishbowl
- Debate
- SOAPSTone
- RAFT
- TWIST

LANGUAGE AND WRITER'S CRAFT

Instruction that provides grammar support and instruction in the context of actual reading and writing

- Revising and Editing
- Verbs and Mood
- Transitions and Quotations
- Embedding Direct Quotations
- Active and Passive Voice
- Choosing Mood
- Shifts in Voice and Mood
- Using Voice and Mood for Effect
- Reviewing Participial Phrases
- Reviewing Clauses
- Verbals
- Using Verbals

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Ninth Grade

Unit / Core Text	Essential Questions	Academic Vocabulary	Embedded Assessments	Unit Goals
Unit 1 **Coming of Age** ***Independent reading novels*** **(Novel)**	What does it mean to "come of age"? How are rhetorical appeals used to influence an audience?	strategize inference denotation connotation transcript claim counterclaim analogy	EA 1: Writing and Presenting an Interview Narrative EA 2: Writing an Argumentative Essay	▪ To understand the concept of coming of age ▪ To identify diction, syntax, imagery, and tone--and to understand the way they work together to convey an author's or speaker's voice ▪ To incorporate voice effectively in one's own writing ▪ To support an inference or claim using valid reasoning and relevant and sufficient evidence ▪ To analyze and use rhetorical appeals and evidence to present an argument to an audience
Unit 2 **Defining Style** ***Edward Scissorhands*** **(Film)**	What makes a good story? What are the elements of a style analysis?	verify commentary textual commentary textual evidence	EA 1: Writing a Short Story EA 2: Writing a Style Analysis Essay	▪ To identify specific elements of an author's style ▪ To develop close reading skills ▪ To review and analyze elements of fiction and write a short story ▪ To identify cinematic techniques and analyze their effects ▪ To analyze syntactical structure and use clauses to achieve specific effects
Unit 3 **Coming of Age in Changing Times** ***To Kill a Mockingbird*** **(Novel)**	What impact does context have on a novel and on the reactions of readers to it? How does a key scene from a novel contribute to the work as a whole?	context primary source secondary source plagiarize parenthetical citations valid rhetoric annotated bibliography censor censorship evaluate	EA 1: Historical Investigation and Presentation EA 2: Writing a Literary Analysis Essay	▪ To gather and integrate relevant information from multiple sources in order to answer research questions ▪ To present findings clearly, concisely, and logically, making strategic use of digital media ▪ To analyze how literary elements contribute to the development of a novel's themes ▪ To write a literary analysis, citing textual evidence to support ideas and inferences
Unit 4 **Exploring Poetic Voices** ***Selected Poems***	What is Poetry? What can a writer learn from studying an author's craft and style?	complementary emulate interpretation oral interpretation elaborate (v.)	EA 1: Creating a Poetry Anthology EA 2: Analyzing and Presenting a Poet	▪ To develop the skills and knowledge to analyze and craft poetry ▪ To analyze the function and effects of figurative language ▪ To write original poems that reflect personal voice, style, and an understanding of poetic elements ▪ To write a style analysis essay ▪ To present an oral interpretation of a poem
Unit 5 **Coming of Age on Stage** ***Romeo and Juliet*** **(Drama)**	How do actors and directors use theatrical elements to create a dramatic interpretation? Why do we study Shakespeare?	vocal delivery visual delivery argument claim evidence synthesis counterclaim concession refutation hook concluding statement call to action	EA 1: Presenting a Dramatic Interpretation EA 2: Writing a Synthesis Argument	▪ To cite textual evidence to support analysis of a dramatic text ▪ To analyze the representation of key scenes in text, film, and other mediums ▪ To collaborate with peers on an interpretive performance ▪ To conduct research to answer questions and gather evidence ▪ To analyze how an author uses rhetoric to advance a purpose ▪ To write an argument to support a claim

Red = Core Text

02/14/14

KEY TEXTS Texts representative of themes and rigorous reading experiences in the level (Note: this is just a sample of the texts included in the level)	
Novel:	"Spotlight," excerpt from *Speak,* by Laurie Halse Anderson
Short Story:	"Marigolds," by Eugenia Collier
Poetry:	"'Race' Politics," by Luis J. Rodriguez
Memoir:	from *Always Running,* by Luis J. Rodriguez
Speech:	Remarks by the President in a National Address to America's Schoolchildren
Editorial:	"An Early Start on College," *Star Tribune*
Poetry:	"Fire and Ice," by Robert Frost
Short Story:	"The Gift of the Magi," by O. Henry
Short Story:	"The Cask of Amontillado," by Edgar Allan Poe
Film:	*Charlie and the Chocolate Factory* (2005), directed by Tim Burton
Informational Text:	"Jim Crow: Shorthand for Separation," by Rick Edmonds
Informational Text:	Jim Crow Laws, Martin Luther King, Jr. National Historic Site
Novel:	*To Kill a Mockingbird,* by Harper Lee
Film:	Clips from *To Kill a Mockingbird,* directed by Robert Mulligan
Poetry:	"Ode to My Socks," by Pablo Neruda
Poetry:	"Combing," by Gladys Cardiff
Poetry:	"I Wandered Lonely as a Cloud," by William Wordsworth
Poetry:	"Harlem," by Langston Hughes
Drama:	*Romeo and Juliet,* by William Shakespeare
News Article:	"Britain puts on a Shakespeare marathon as world arrives for the Olympic Gar by Associated Press, *The Washington Post*
Nonfiction:	from *How Shakespeare Changed Everything,* by Stephen Marche
Speech:	"Nancy Hanks Lecture on Arts and Public Policy," by Kevin Spacey
Film:	Two film interpretations of *Romeo and Juliet*

STRATEGIES FOCUS

Explicit teaching of effective strategies that provide scaffolding for all students while moving toward Instructional reading

- Double Entry Journal
- RAFT
- SOAPSTone
- SMELL
- Diffusing
- SIFT
- Levels of Questions
- QHT
- TWIST

LANGUAGE AND WRITER'S CRAFT

Instruction that provides grammar support and instruction in the context of actual reading and writing

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Tenth Grade				
Unit / Core Text	**Essential Questions**	**Academic Vocabulary**	**Embedded Assessments**	**Unit Goals**
Unit 1 **Cultural Conversations**	How do cultural experiences shape, impact, or influence our identity and perceptions? How do we synthesize multiple sources of information into a cohesive argument?	synthesis perspective argument claim counterclaim concession refutation	EA 1: Writing About Cultural Identity EA 2: Writing a Synthesis Paper	• To analyze how culture affects identity and perceptions • To practice effective speaking and listening skills that build capacity for collaboration and communication • To analyze the concept of voice in reading and writing • To examine and apply the elements of argument • To analyze and apply syntactic structures in writing
Unit 2 **Cultural Perspectives**	How can cultural experiences and perspectives be conveyed through memorable narratives? What issues resonate across cultures, and how are arguments developed in response?	stereotype artifact allusion empirical evidence logical evidence anecdotal evidence fallacy	EA 1: Writing a Narrative EA 2: Creating an Argument	• To construct a narrative that recounts issues of cultural identity • To recognize the role that culture plays in defining ourselves as individuals • To examine perspectives of justice across cultures and over time • To understand and apply the elements of argument • To develop an argument on an issue for a specific audience, using an effective genre
Unit 3 **Cultures in Conflict** ***Things Fall Apart*** **(Novel)**	How might a culture change when it encounters new ideas and members? How can an author use a fictional character to make a statement about culture?	reliability validity plagiarism annotated bibliography	EA 1: Researching and Comparing Pre- and Post-Colonial Ibo Culture EA 2: Writing a Literary Analysis Essay	• To analyze cultural experiences reflected in a work of literature from outside the United States • To analyze how complex characters in a novel develop and interact to advance a plot or theme • To research to answer questions, explore complex ideas, and gather relevant information • To present findings to an audience clearly and logically, making use of digital media • To draw evidence from a literary text to support analysis and reflection
Unit 4: **Dramatic Justice** **Antigone** **(Drama)**	How can one communicate characterization through oral interpretations? How do complex characters advance the plot and develop the themes of a drama?	justice criteria advance (v)	EA1: Presenting an Oral Interpretation of Literature EA2: Writing a Literary Analysis Essay on Characterization and Theme	• To evaluate and critique oral interpretations • To analyze characterization, conflicting motivations of a complex character, and major themes in a classic Greek drama • To analyze point of view and cultural experience reflected in literature from outside the United States • To analyze and present an oral interpretation of a monologue conveying a complex character's voice • To write a literary analysis essay examining the development of a tragic hero and the development of plot and theme
Unit 5: **Building Cultural Bridges** ***The 11th Hour*** **(Film)**	How do cultural differences contribute to conflicts over environmental issues? In what ways do nonfiction texts influence perceptions of their subject?	controversial documentary imperative fallacies refutation stakeholder advocate objective subjective	EA 1: Presenting a Solution to an Environmental Conflict EA 2: Representing an Argument In a Documentary Film	• To examine how nonfiction texts (both print and non-print) construct our perceptions of what is true • To analyze how writers and speakers use evidence and appeals to support a claim • To examine the credibility of a text or its author • To explore a complex issue or problem from multiple perspectives and to work with peers to present a solution • To use media strategically to enhance a presentation

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02/14/14

KEY TEXTS Texts representative of themes and rigorous reading experiences in the level (Note: this is just a sample of the texts included in the level)	
Informational Text:	"What Is Cultural Identity?"
Personal Essay:	"Ethnic Hash," by Patricia Williams
Art:	*Self-Portrait on the Borderline Between Mexico and the United States*, by Frida Kahlo
Poetry:	"Legal Alien," by Pat Mora
Essay:	"Where Worlds Collide," by Pico Iyer
Short Story:	"Everyday Use" by Alice Walker
Essay:	"An Indian Father's Plea," by Robert Lake
Memoir:	Excerpt from *Funny in Farsi*, by Firoozeh Dumas
Graphic Novel:	Excerpt from *Persepolis*, by Marjane Satrapi
Poetry:	"Grape Sherbet," by Rita Dove
Memoir:	Excerpt from *The Hunger of Memory*, by Richard Rodriguez
Speech:	"On Surrender at Bear Paw Mountain, 1877," by Chief Joseph
Speech:	"On Women's Right to Vote," by Susan B. Anthony
Speech:	"One Word of Truth Outweighs the World," by Aleksandr Solzhenitsyn
Speech:	Excerpt from "Hope, Despair, and Memory," Nobel Lecture by Elie Wiesel
Drama:	Excerpt from: *The Tragedy of Julius Caesar* by William Shakespeare
Novel:	Excerpt from *A Sport of Nature* by Nadine Gordimer.
Drama:	*Antigone* by Sophocles
Film:	*The 11th Hour* (2007), directed by Nadia Conners and Leila Conners Petersen
Press Release:	'The HSUS and Wild Fish Conservancy File Suit To Stop Sea Lion Killing At Bonneville Dam" (2011) by the Humane Society of the United States
Editorial:	"Sea lions vs. salmon: Restore balance and common sense" (2008) by Fidelia Andy
Novel:	*Things Fall Apart*, by Chinua Achebe

STRATEGIES FOCUS

While explicit teaching of effective strategies has taken place in previous grade levels, the following list highlights key strategies reinforced in this grade level.

- OPTIC
- Socratic Seminar
- RAFT
- Discussion Groups
- Levels of Questioning
- SMELL

LANGUAGE AND WRITER'S CRAFT

Instruction that provides grammar support and instruction in the context of actual reading and writing

- Syntax
- Colon and Semicolon
- Phrases and Clauses
- Clauses
- Sentence Types and Structure
- Outlining and Organizing an Argument
- Active and Passive Voice
- Compare/Contrast
- Academic Voice
- Using Precise Language
- Word Patterns
- Semicolons and Colons
- Consulting a Style Manual
- Embedding Quotations
- Punctuating Adjective Clauses
- Citation Styles

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Poetry: "Prayer to the Masks," by Léopold Sedar Senghor **Poetry:** "The Second Coming," by William Butler Yeats	

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Eleventh Grade				
Unit / Core Text	**Essential Questions**	**Academic Vocabulary**	**Embedded Assessments**	**Unit Goals**
Unit 1 **The American Dream**	What is the "American Dream"? How do writers use the strategies of definition to define a concept?	Primary Source Defend Structure Challenge Qualify	EA 1: Writing a Definition Essay EA 2: Synthesizing the American Dream	• To understand and define complex concepts such as the American Dream • To identify and synthesize a variety of perspectives • To analyze and evaluate the effectiveness of arguments • To analyze representative texts from the American experience
Unit 2 **The Power of Persuasion** ***The Crucible*** **(Drama)**	How can artistic expression advance social commentary? How are the components of rhetoric applied to the creation and delivery of persuasive speeches?	Rhetoric Social Commentary Historical Context Rhetorical Context Vocal Delivery	EA 1: Creating and Performing a Dramatic Scene EA 2: Writing and Presenting a Persuasive Speech	▪ To interpret a text in consideration of its context ▪ To analyze an argument ▪ To create and present a dramatic scene about a societal issue ▪ To define and apply the appeals and devices of rhetoric ▪ To analyze, write, and present a persuasive speech ▪ To examine and apply syntactic structures in the written and spoken word
Unit 3 American Forums: The Marketplace of Ideas	How do news outlets impact public opinion or public perception? How does a writer use tone to advance an opinion?	Reasoning Evidence Bias Editorial Fallacies Parody Caricature	EA 1: Creating an Op-Ed News Project EA 2: Writing a Satirical Piece	• To analyze and create editorial and opinion pieces • To identify and analyze fallacious reasoning in a text • To analyze how writers use logic, evidence, and rhetoric to advance opinions • To define and apply the appeals and devices of rhetoric • To analyze and apply satirical techniques • To examine and apply syntactic structures in the written and spoken word
Unit 4 **The Pursuit of Happiness** ***Into the Wild*** **(Biography)**	What does it mean to pursue happiness? How can a writer use/manipulate genre conventions for effect?	Genre Conventions	EA 1: Writing a Personal Essay EA 2: Writing a Multi-Genre Research Project	• To analyze and evaluate the structural and stylistic features of texts • To compose a personal essay that employs stylistic techniques • To use a variety of genres to express a coherent theme
Unit 5 **An American Journey** ***Their Eyes Were Watching God*** **(Novel)**	How do cultural movements such as the Harlem Renaissance reflect and create people's attitudes and beliefs? How is one writer's work both a natural product of and a departure from the ideas of a specific literary movement in American literature?	Renaissance Annotated Bibliography	EA 1: Presenting a Literary Movement: The Harlem Renaissance EA 2: Creating an Analytical Essay	• To explore the concept of "journey" • To analyze a writer's complex writing and stylistic choices • To research and synthesize information about a literary era • To create a multimedia presentation

Red = Core Text

02/14/14

KEY TEXTS Texts representative of themes and rigorous reading experiences in the level (Note: this is just a sample of the texts included in the level)		STRATEGIES FOCUS While explicit teaching of effective strategies has taken place in previous grade levels, the following list highlights key strategies reinforced in this grade level.
Poetry:	"I, Too, Sing America," by Langston Hughes	• SOAPSTone • TP-CASTT • Discussion Groups • Close Reading • Marking the Text • Diffusing • OPTIC
Short Story:	"America and I" by Anzia Yezierska	
Speech:	"The Four Freedoms" by President Franklin Delano Roosevelt	
Historical Document:	Declaration of Independence	
Historical Document:	"The Preamble to the Constitution of the United States"	
Historical Document:	"The Bill of Rights: A Transcriptions"	
Drama:	Excerpt from *A Raisin in the Sun*, by Lorraine Hansberry	
Essay:	"The Right to Fail," by William Zinsser	
Sermon:	"Sinners in the Hands of an Angry God," by Jonathan Edwards	
Essay:	"The Trial of Martha Carrier," by Cotton Mather	
Drama:	*The Crucible* by Arthur Miller	**LANGUAGE AND WRITER'S CRAFT** Instruction that provides grammar support and instruction in the context of actual reading and writing
Speech Excerpt:	from "A Declaration of Conscience," by Margaret Chase Smith	
Speech:	"Second Inaugural Address," by Abraham Lincoln	
Speech:	"Speech to the Virginia Convention," by Patrick Henry	• Using Direct Quotes • Quoting Original Sources • Varying Sentence Openings • Transitions • Syntax • Rhetoric • Evolving Language • Definitions and Word Patterns • Loose or Cumulative Sentence Patterns • Antithesis • Review of Syntax • Informal Spelling and Usage • Relative Pronouns and Clauses • Annotated Bibliography • Writing a Thesis Statement • Levels of Diction
Speech:	"First Inaugural Address," by Franklin D. Roosevelt	
Primary Document:	"First Amendment to the United States Constitution"	
Editorial:	"Time to raise the bar in high schools," by Jack O'Connell	
Editorial:	"New Michigan Graduation Requirements Shortchange Many Students," by Nick Thomas	
Parody:	"In Depth but Shallowly," by Dave Barry	
Satire:	"Advice to Youth," by Mark Twain	
Essay:	from *Self-Reliance*, by Ralph Waldo Emerson	
Essay:	from *Walden*, by Henry David Thoreau	
Art:	*The Oxbow* by Thomas Cole	
Art:	*Kindred Spirits* by Asher Durand	
Biography:	*Into the Wild*, by Jon Krakauer	
Essay:	"How It Feels to Be Colored Me," by Zora Neale Hurston	
Poetry:	"Lift Every Voice and Sing," by James Weldon Johnson	
Novel:	*Their Eyes Were Watching God*, by Zora Neale Hurston	
Literary Criticisim:	Excerpt from "On 'From the Dark Tower'," by Eugenia W. Collier	

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Senior English

Unit / Core Text	Essential Questions	Academic Vocabulary	Embedded Assessments	Unit Goals
Unit 1 Perception is Everything	How do artists and writers organize or construct art or text to convey meaning? What does it mean to be a stranger in the village?	aphorism perception perspective scenario marginalize dominant subordinate imperialism	EA 1: Creating an Argumentative Photo Essay EA 2: Writing a Reflective Essay	• To examine the relationship between perspective and critical theory • To analyze and apply critical theories to various texts studied and created • To control and manipulate textual elements in writing to clearly and effectively convey a controlling idea or thesis • To use punctuation and syntax to create meaning and effect in writing
Unit 2 **The Collective Perspective** ***Pygmalion*** **(Drama)**	How does applying a critical perspective affect an understanding of text? How does a new understanding gained through interpretation help or hinder your enjoyment of a text?	enfranchisement patriarchal archetypes Archetypal Criticism artistic license Marxist Criticism Feminist Criticism montage	EA 1: Illuminating *Pygmalion* EA 2: Applying a Critical Perspective	• To enhance critical thinking by studying Feminist, Marxist, and Archetypal critical perspectives • To apply multiple critical perspectives to drama, nonfiction, and non-print texts • To use the writing process to create an engaging script and an insightful analytical response • To use a variety of organizational and rhetorical strategies for different modes of writing
Unit 3 **Evolving Perspectives** ***Othello*** **(Drama)**	What role does literature play in the examination of recurring social issues? How can a dramatic performance reflect a critical perspective?	Scenario Historical Criticism	EA 1: Writing an Argument EA 2: Staging an Interpretation	• To analyze multiple interpretations of a Shakespearean tragedy • To examine critical perspectives as they apply to the drama • To plan and perform dramatic interpretations of selected scenes • To analyze the ways in which historical contexts have influenced performances of the play • To analyze the use of meter and rhythm in poetry and in the play
Unit 4 **Creating Perspectives**	How do media sources influence our understanding of the truth and significance of an issue? How are media texts constructed to support an agenda or interpretation?	agenda media media channel documentary film primary footage archival footage synthesize conventions	EA 1: Examining How an Issue is Presented in Media Texts EA 2: Creating a Documentary Media Text	• To evaluate media as an information source • To investigate a variety of perspectives on a single event • To analyze how different critical perspectives shape the reporting and interpreting of events • To create a media text applying multiple lenses to the investigation and representation of an event • To analyze the integration of quotations and their effect on the reader
Unit 5 **Multiple Perspectives** ***The Arrival*** **(Graphic Novel)**	How can an examination of text through multiple perspectives affect understanding? How do media production elements shape a message?	culture	EA: Presenting a Literary Work Through Multiple Critical Perspectives	• To trace a reading through a critical perspective over the course of an extended text • To analyze two literary works through multiple critical perspectives • To analyze and then use text features of a graphic novel • To create a presentation using a performance-based or visual medium • To identify parataxis and use it for effect

Red = Core Text

02/14/14

KEY TEXTS Texts representative of themes and rigorous reading experiences in the level (Note: this is just a sample of the texts included in the level)	
Poetry:	"My Papa's Waltz," by Theodore Roethke
Poetry:	"The Poor Man's Burden," by George McNeill
Article:	"Dirty Work: The Creeping Rollback of Child –Labor Laws, by Adam Cohen
Essay:	"On Seeing England for the First Time," by Jamaica Kincaid
Novel:	"Lindo Jong: Double-Face," from The *Joy Luck Club*, by Amy Tan
Reflective Essay:	"Shooting an Elephant," by George Orwell
Myth:	"Orpheus Sings: Pygmalion and the Statue,"from *Metamorphoses* by Ovid
Drama:	*Pygmalion*, by George Bernard Shaw
Nonfiction:	"Cinderella, the Legend," from *Kiss Cinderella Goodbye,* by Madonna Kolbenschlag
Film:	*Rear Window*, directed by Alfred Hitchcock
Short Story:	"A Rose for Emily," by William Faulkner
Short Story:	"The Story of an Hour," by Kate Chopin
Poem:	"The Canonization," by John Donne
Drama:	*Othello*, by William Shakespeare
Essay:	*"Othello* on Stage and Screen," by Sylvan Barnet
Film:	*Othello,* directed by Oliver Parker
Essay:	"How the Media Twists the News" by Sheila Gribben Liaugminas
Online article:	"Speaking Up and Speaking Out," by Melissa Silverstein
Article:	"A Tired Old Song," by Jonah Goldberg
Documentary Film:	*Frontline, News War, Part III: What's Happening to the News?*
Graphic Novel:	*The Arrival, by Shaun Tan*
Poetry:	"The New Colossus," by Emma Lazarus
Poetry:	"Refugee in America," by Langston Hughes

STRATEGIES FOCUS

While explicit teaching of effective strategies has taken place in previous grade levels, the following list highlights key strategies reinforced in this grade level.

- Close Reading
- Discussion Groups
- OPTIC
- Levels of Questioning
- SOAPSTone
- SMELL
- Rehearsal
- Socratic Seminar

LANGUAGE AND WRITER'S CRAFT

Instruction that provides grammar support and instruction in the context of actual reading and writing

- Punctuation and Syntax
- Review of Verbals
- Summarizing
- Organizing Information
- Writing a Dramatic Script
- Punctuating Lists in Text
- Citing Textual Evidence
- Rhythm and Meter
- Determining the Meanings of Words
- Language Change
- Citing Quotations
- Using Hyphens to Create Compound Modifiers
- Parataxis

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Unit 1- Number Concepts

Prerequisite Skills:
• Ordering rational numbers (Items 1, 5, 8) 6.NS.C.7, 5.NBT.A.3b, 3.NF.A.3
• Properties of numbers. (Item 2) 3.OA.B.5
• Modeling fractions. (Items 3,4) 3.NF.A.1, 3.NF.A.2
• Divisibility. (Items 6, 7) 3.OA.C.7

Materials:
Fraction strips/circles (optional); number cubes

Activity or EA	Activity or EA Standards Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
1 (Investigative) Whole Numbers and Decimals- *Science, Shopping, and Society*	In previous grades, students have learned how to compute with whole numbers and decimals. In Activity 1, students continue to develop mastery computing with whole numbers and decimals. They begin by comparing and ordering whole numbers and decimals, using place value and using a number line. Then they build on previous knowledge to continue to develop fluency in using the standard algorithms to add, subtract, multiply, and divide whole numbers and decimals.	Lessons 1-1 to 1-5 (5 lessons)	**6.NS.B.2** Fluently divide multi-digit numbers using the standard algorithm. **6.NS.B.3** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. **6.NS.C.7** Understand ordering and absolute value of rational numbers. **6.NS.C.7a** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret* −3 > −7 *as a statement that* −3 *is located to the right of* −7 *on a number line oriented from left to right.* **6.NS.C.7b** Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write* −3 *°C* > −7 *°C to express the fact that* −3*°C is warmer than* −7 *°C.*
EA 1 Comparing and Computing with Whole Numbers and Decimals- *For the Birds*	• Compare and order decimals • Add and subtract decimals • Multiply decimals • Divide by whole numbers • Divide by decimals		**6.NS.B.2** Fluently divide multi-digit numbers using the standard algorithm. **6.NS.B.3** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. **6.NS.C.7** Understand ordering and absolute value of rational numbers. **6.NS.C.7a** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret* −3 > −7 *as a statement that* −3 *is located to the right of* −7 *on a number line oriented from left to right*. **6.NS.C.7b** Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write* −3*°C* > –7*°C to express the fact that* −3*°C is warmer than* −7*°C.*

2 **(Guided)** Prime Factorization and Exponents- *The Primes of Your Life*	In Activity 2, students distinguish between prime and composite numbers. They learn how to write the prime factorization of a composite number, including using exponents when a prime factor occurs more than once.	Lessons 2-1 and 2-2 (2 Lessons)	**6.EE.A.1** Write and evaluate numerical expressions involving whole-number exponents.
3 **(Guided)** Greatest Common Factor and Least Common Multiple- *Parties and Pups*	In Activity 3, students review how to find the GCF and the LCM using a variety of methods, including using prime factorization. A firm understanding of these concepts is essential for success in fraction computations.	Lessons 3-1 and 3-2 (2 Lessons)	**6.NS.B.4** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express* 36 + 8 *as* 4 (9 + 2).
EA 2 Prime Factorization, Exponents, GCF, and LCM- *Winter Sports*	• Classifies a number as prime or composite • Prime factorization • Exponents • Greatest Common Factor • Least Common Multiple		**6.NS.B.4** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express* 36 + 8 *as* 4 (9 + 2). **6.EE.A.1** Write and evaluate numerical expressions involving whole-number exponents.
4 **(Investigative)** Fractions and Mixed Numbers- *The Choice is Yours*	In Activity 4, students use a variety of methods, including manipulatives, diagrams, number lines, the GCF, and the LCM to rename, simplify, compare, and order fractions and mixed numbers.	Lessons 4-1 to 4-4 (4 Lessons)	**6.NS.C.7** Understand ordering and absolute value of rational numbers. **6.NS.C.7a** Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret* −3 > −7 *as a statement that* −3 *is located to the right of* −7 *on a number line oriented from left to right.* **6.NS.C.7b** Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write* −3 °*C* > −7 °*C to express the fact that* −3°*C is warmer than* −7 °*C.*
5 **(Guided)** Multiplying Fractions and Mixed Numbers- *Skateboarding Fun!*	In earlier grades, students recognized fractions, understood what they meant, and learned to perform operations with them. This activity presents students with opportunities both to gain proficiency in multiplying rational numbers, and to be engaged at a new and more abstract level.	Lessons 5-1 and 5-2 (2 Lessons)	No Specific CC standard at grade 6. This is a reinforcement activity for proficiency in multiplying rational numbers. May be needed to fill in transition gaps.

6 **(Directed)** Dividing Fractions and Mixed Numbers- *How Many Sandwiches?*	Students continue their study of operations on rational numbers in these lessons focusing on the operation of division. Students have extended opportunities to model and solve both numerical and real-world problems requiring division by both fractions and mixed numbers.	Lessons 6-1 and 6-2 (2 Lessons)	**6. NS.A. 1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e. g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷(3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷(3/4) = 8/9 because ¾ of 8/9 is 2/3. (in general, (a/b) ÷ (c/d)= ad/bc.) How much chocolate will each person get if 3 people share ½ lb of the chocolate equally? ……*
EA 3 Multiplying and Dividing Fractions and Mixed Numbers- *Juan's Bookcase*	• Multiply and Divide Fractions • Multiply and Divide Mixed Numbers		**6. NS.A. 1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e. g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷(3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷(3/4) = 8/9 because ¾ of 8/9 is 2/3. (in general, (a/b) ÷ (c/d)= ad/bc.) How much chocolate will each person get if 3 people share ½ lb of the chocolate equally? ……* **6.NS.C.7** Understand ordering and absolute value of rational numbers.

Unit 2- Integers

Prerequisite Skills:
• Perform computations with numbers. (Items 3, 7) 6.NS.B.2, 4.NBT.B.4, 4.NBT.B.5
• Create visual representations and models. (Items 2, 4, 8) 3.OA.D.8, 2.MD.B.6, 2.OA.A.1
• Order whole numbers (Item 3) 2.NBT.A.4
• Locate numbers and ordered pairs on number lines and the coordinate plane. (Items 1, 5, 6) 5.G.A.1, 5.G.A.2

Materials:
Two-color counters, graph paper

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
7 (Guided) Introduction to Integers- *Get the Point?*	Until now, students' study of numbers has largely been confined to positive numbers. In Activity 7, they move to representing integers on a number line, finding the opposites and absolute value of integers, and using integers to represent quantities in real-world contexts.	Lesson 7-1 and 7-2 (2 Lessons)	**6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. **6.NS.C.6** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. **6.NS.C.6a** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., −(−3) = 3, and that 0 is its own opposite.
8 (Directed) Adding and Subtracting Integers- *What's the Temperature?*	Once students are comfortable with representing integers on a number line, then they can add and subtract integers. Explain that students will model integer addition and subtraction and then learn rules to find the sum or difference of two integers.	Lessons 8-1 to 8-3 (3 Lessons)	No Specific CC standard at grade 6. This is a reinforcement activity for proficiency with integers.

EA 1 Integer Sums and Differences- *Hot and Cold*	• Use the number line • Add integers • Subtract integers		**6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/ below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. **6.NS.C.6** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. **6.NS.C.6a** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself,*e.g., −(−3) = 3, and that 0 is its own opposite.*
9 **(Guided)** The Coordinate Plane**-** *Map it Out!*	Once students are comfortable with representing integers on a number line, they can extend number line diagrams and coordinate axes familiar from previous grades to represent points in the plane with both positive and negative number coordinates.	Lessons 9-1 and 9-2 (2 Lessons)	**6.NS.C.6** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
10 **(Investigative)** Multiplying and Dividing Integers- *Temperature Ups and Downs*	Students continue developing fluency working with integers in this activity as they use concrete models of real-world operations involving multiplying and dividing integers.	Lessons 10-1 and 10-2 (2 Lessons)	No Specific CC standard at grade 6. This is a reinforcement activity for proficiency in developing fluency with integers.
EA 2 Coordinate Plane and Multiplying and Dividing Integers- *Scavenger Hunt*	• Use the Coordinate plane • Multiply integers • Divide integers		**6.NS.C.6** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. **6.NS.C.6a** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite. **6.NS.C.6b** Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

Unit 3- Expressions and Equations

Prerequisite Skills:
• Tables of values and equations (Items 1, 2) 4.OA.C.5
• Coordinate plane (Item 3) 5.G.A.2
• Expressions (Items 4, 5, 6) 6.EE.A.2c
• Opposites and reciprocals (Items 7, 8) 6.NS.A.1, 5.NF.B7, 3.OA.C.7, 1.OA.B.4

Materials:
None

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
11 (Guided) Expressions- *A Fairly Ordered Operation*	In Activity 11, students continue developing fluency in writing numerical and algebraic expressions. They follow the order of operations and use substitution to evaluate expressions. They apply the properties of operations to generate equivalent expressions and determine whether two expressions are equivalent.	Lessons 11-1 to 11-4 (4 Lessons)	**6.EE.A.1** Write and evaluate numerical expressions involving whole-number exponents. **6.EE.A.2** Write, read, and evaluate expressions in which letters stand for numbers. **6.EE.A.2a** Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from* 5*" as* 5 − *y.* **6.EE.A.2b** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression* 2(8 + 7) *as a product of two factors; view* (8 + 7) *as both a single entity and a sum of two terms.*
12 (Guided) Equations- *Dog Gone*	Students have applied the steps involved in solving one-step equations to solve real word problems in previous grades. In Activity 12, students distinguish between expressions and equations and write one-variable, one-step equations based on real-world problem situations. Then they use substitution to determine whether a given number from a set of numbers makes an equation true.	Lessons 12-1 and 12-2 (2 Lessons)	**6.EE.B.5** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. **6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. **6.EE.B.7** Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

EA 1 Order of Operations and Expressions **–** *The Cost of After-School Activities*	• Read, write, and evaluate Numerical and algebraic expressions • Apply the order of operations • Apply properties to generate equivalent expressions • Use variables to represent numbers and write expressions when solving a real-world or mathematical problems • Solve real-world and mathematical problems by writing and solving equations		**6.EE.A.1** Write and evaluate numerical expressions involving whole-number exponents. **6.EE.A.2** Write, read, and evaluate expressions in which letters stand for numbers. **6.EE.A.2a** Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from* 5*" as* 5 − *y.* **6.EE.A.2b** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression* 2 (8 + 7) *as a product of two factors; view* (8 + 7) *as both a single entityand a sum of two terms.*
13 **(Directed)** Solving Addition and Subtraction Equations- *Music to My Ears*	In previous grades students have solved addition and subtraction problems. In Activity 13, students model problem situations using one-step addition and subtraction equations. They use a variety of methods to solve the equations, including mental math, balance scale models, and algebra.	Lessons 13-1 to 13-4 (4 Lessons)	**6.EE.B.7** Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.
14 **(Directed)** Solving Multiplication and Division Equations- *Trash Talk*	In previous grades students have solved multiplication and division problems. In Activity 14, students model problem situations using one-step multiplication and division equations. They learn to solve the equations using mental math, guess and check, and algebraically using inverse operations.	Lessons 14-1 to 14-3 (3 Lessons)	**6.EE.B.7** Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.
15 **(Guided)** Expressions and Equations- *Up in the Air*	In previous grades, students' study of expressions and equations has including writing and modeling addition and multiplication equations. In Activity 15, students build on these skills to represent situations with inequalities, and use number lines to represent the solutions to inequalities.	Lessons 15-1 and 15-2 (2 Lessons)	**6.EE.B.5** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. **6.EE.B.8** Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

16 (Investigative) Expressions and Equations- *Moving Right Along*	Students' study of expressions and equations has included writing and modeling addition and multiplication equations and representing situations with inequalities. In Activity 16, students move on to expressing relationships with tables and writing equations to represent relationships given verbal representations or tables.	Lessons 16-1 and 16-2 (2 Lessons)	**6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*
EA 2 Expressions and Equations- *Moving Right Along*	• Solve real-world and mathematical problems by writing and solving equations • Write an inequality to represent a condition in a real-world problem • Graph an inequality • Write an equation to represent a relationship between a dependent and independent variable • Analyze the relationship between the dependent and independent variables in an equation using graphs and tables and relate these to the equation		**6.EE.B.5** Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. **6.EE.B.7** Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers. **6.EE.B.8** Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Unit 4- Ratios

Prerequisite Skills:
• Number lines. (Item 1) 2.MD.B.6
• Fractions and Decimals (Items 2, 3, 6, 7) 3.NF.A.1, 3.NF.A.3b, 5.NF.B.3, 5.NBT.7
• Unit Measures (Item 4) 4.MD.A.1
• Number Systems (Item 5) 4.OA.B.4
• Equations (Item 8) 6.EE.B.7

Materials:
None

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
17 (Directed) Understanding Ratios- *All About Pets*	In this activity, students learn that a ratio is a comparison of two quantities, and can be written as a fraction, using the word "to", or using a colon. They also learn the terminology associated with ratios, and apply ratios in real-life situations to find missing values in a table and represent the table as a graph in the coordinate plane determining if the relationship is proportional.	Lessons 17-1 and 17-2 (2 Lessons)	**6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."* **6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. **6.RP.A.3a** Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
18 (Directed) Reasoning with Ratios- *A Picture Is Worth*	In this activity, students use ratio and rates to solve problems, and use ratio reasoning to convert measurement units. They will represent mathematical and real-world problems with ratios and rates using scale factors and proportions.	Lessons 18-1 and 18-2 (2 Lessons)	**6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. **6.RP.A.3d** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. **6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*

19 (Investigative) Rates and Unit Rates- *Zooming!*	In this activity, students find unit rates and solve unit rate problems. They will also convert units within a measurement system and represent mathematical and real-world problems involving ratios and rates using scale factors and proportions.	Lessons 19-1 to 19-3 (3 Lessons)	**6.RP.A.2** Understand the concept of a unit rate *a/b* associated with a ratio a:b with *b* _ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is ¾ cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* **6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. **6.RP.A.3b** Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*
EA 1 Ratios and Rates- *A Summer Job*	• Solve problems involving ratios and proportional relationships • Write equivalent ratios		**6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."* **6.RP.A.2** Understand the concept of a unit rate *a/b* associated with a ratio a:b with *b* _ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is ¾ cup of our for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* **6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
20 (Investigative) Using Models to Understand Percents**-** *A "Cent" for Your Thoughts*	In this activity, students find the percent of a quantity as a rate per 100. They also represent ratios and percents with concrete models, fractions, and decimals. They represent benchmark percents, and they use percents, fractions, and decimals to show parts of the same whole.	Lessons 20-1 to 20-3 (3 Lessons)	**6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. **6.RP.A.3c** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

21 (Guided) Applying Percents- *Feel the Beat*	In this activity, students use percent/100 = part/whole to solve real-world problems given the part and the whole. They also use ratios and rates to solve real-world and mathematical problems.	Lessons 21-1 to 21-3 (3 Lessons)	**6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. **6.RP.A.3c** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
EA 2 Understanding and Applying Percents- *An Ice Cream Treat*	• Find the percent of a quantity as a rate per 100 • Represent ratios and percents with fractions and decimals • Use equivalent percents, fractions, and decimals to show parts of the same whole • Represent percents with concrete models, fractions, and decimals		**6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. **6.RP.A.3c** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

Unit 5- Geometric Concepts

Prerequisite Skills:
• Two-dimensional figures. (Items 1, 2, 4) 2.G.A.1
• Perimeter (Item 3) 3.MD.D.8
• Coordinate Plane (Items 5, 6, 7, 8) 6.NS.C.8, 4.MD.A.3, 3.MD.D.8

Materials:
Three number cubes per group; one set of segment models per group; protractors, rulers; scissors; graph paper; unit cubes; tape

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
22 (Investigative) Angles and Triangles- *Triangle Trivia*	Students extend their knowledge of triangles to include determining when three lengths form a triangle, the sum of angles of a triangle, and the relationship between the lengths of sides and measures of angles in a triangle.	Lessons 22-1 and 22-2 (2 Lessons)	No specific Grade 6 CC standard aligns with this. Can be used for transition gaps. Students extend their knowledge of triangles.
23 (Investigative) Area and Perimeter of Polygons- *Play Area*	In previous grades, students have learned how to classify quadrilaterals based on their properties. In Activity 23, students use properties of quadrilaterals to determine missing side lengths and angle measures. They model and develop area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes. They also write equations that represent problems related to the area of quadrilaterals and triangles where dimensions are positive rational numbers.	Lessons 23-1 to 23-3 (3 Lessons)	**6.G.A.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

24 (Investigative) Polygons on the Coordinate Plane- *Wall Art*	Students use coordinate geometry to draw polygons with vertices in all four quadrants, find the length of a segment joining points with the same first coordinate or the same second coordinate, and solve problems involving the area of polygons on the coordinate plane.	Lessons 24-1 and 24-2 (2 Lessons)	**6.G.A.3** Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
EA 1 Geometric Concepts- *Astronomy Logo*	• Classify triangles and quadrilaterals • Find a missing angle measure in a triangle or a quadrilateral • Find the area of a composite sguare • Find the area of a composite square on the coordinate plane • Solve real-world problems involving the area of rectangles, parallelograms, trapezoids, and triangles		**6.G.A.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. **6.G.A.3** Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
25 (Investigative) Nets and Surface Area- *All Boxed Up*	Students represent three-dimensional figures, in particular cubes and triangular and rectangular prisms, using nets. Then they find the surface area of these figures using nets and by writing equations that relate to the surface area.	Lessons 25-1 and 25-2 (2 Lessons)	**6.G.A.4** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
26 (Guided) Volume- *Crystal Collections*	In previous grades, students have used unit cubes to find the volume of prisms. In Activity 26, students find the volume of rectangular prisms with fractional edge lengths using cubes with fractional edge lengths and applying formulas. They also write equations that represent problems related to the volume of rectangular prisms.	Lessons 26-1 and 26-2 (2 Lessons)	**6.G.A.2** Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l * w * h$ and $V = b * h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

EA 2 Surface Area and Volume of Prisms – *Coloring Creations*	• Represent prisms using nets • Find the surface area of prisms • Find the volume of rectangular prisms • Solve real-world problems Involving the surface area and volume of prisms		**6.G.A.2** Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. **6.G.A.4** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Unit 6- Data Analysis

Prerequisite Skills:
• Order numbers from least to greatest (Items 1–2) 5.NBT.A.3b, 2.NBT.A.4
• Perform the basic operations of addition, subtraction, multiplication, and division (Item 3) 5.NBT.B.5, 5.NBT.B.6, 4.NBT.B.4
• Identify types of graphs (Item 4) 2.MD.D.10
• Construct and describe a bar chart (Item 5) 3.MD.B.3
• Find the average (Items 6–7) 6.SP.B.5c

Materials:
Calculator; graph/grid paper; rulers and/or tape measures; calculators

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
27 (Investigative) Summarizing Data Graphically- *Making a Survey*	In previous grades, students began to develop simple survey questions and graph the results. In Activity 27, students build on these skills and concepts. They answer survey questions, describe variables of surveys, graph the results, and analyze the distribution of the data.	Lessons 27-1 to 27-3 (3 Lessons)	**6.SP.A.1** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.* **6.SP.A.2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
28 (Investigative) Measures of Center- *Bull's Eye*	In the previous activity, students investigated data sets, identified variables as numerical or categorical, and made bar charts, dot plots, or stem plots. In this activity, students make and analyze graphs of data and find the relationship of the mean and median to the distribution.	Lessons 28-1 to 28-3 (3 Lessons)	**6.SP.A.3** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. **6.SP.B.5c** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

EA 1 Types of Variables and Measures of Center- *Dribble, Shoot, Score!*	• Identify statistical questions • Identify categorical and numerical variables • Construct dot plots • Determine measures of center • Analyze shapes of distributions		**6.SP.A.1** Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.* **6.SP.A.2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. **6.SP.A.3** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. **6.SP.B.5c** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
29 **(Investigative)** Measures of Variability – *Making the Grade*	In Activities 28 and 29, students learned to display data, describe the spread and skewness of the data from the graph, and compute the mean and median. In this Activity, students continue their statistical studies with finding measures of variability, including range, mean absolute deviation, and IQR.	Lessons 29-1 to 29-3 (3 Lessons)	**6.SP.A.3** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. **6.SP.B.5c** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
30 **(Investigative)** Summarizing Numerical Data Graphically- *Batter Up!*	Students have learned to display data and find measures of center and variability of the data. In this activity, students continue their statistical studies with computing the five-number summary for numerical data, construct box plots and histograms.	Lessons 30-1 to 30-3 (3 Lessons)	**6.SP.B.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots. **6.SP.B.5** Summarize numerical data sets in relation to their context, such as by: **6.SP.B.5a** Reporting the number of observations. **6.SP.B.5b** Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. **6.SP.B.5c** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. **6.SP.B.5d** Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

EA 2 Measures of Variability and Numerical Graphs- *"Take a Snapshot" Revisited*	• Write statistical questions • Represent data with graphs • Determine the five-number summary • Find measures of center And variability • Describe distributions		**6.SP.A.3** Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. **6.SP.B.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots. **6.SP.B.5** Summarize numerical data sets in relation to their context, such as by: **6.SP.B.5a** Reporting the number of observations. **6.SP.B.5b** Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. **6.SP.B.5c** Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. **6.SP.B.5d** Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Unit 7- Personal Financial Literacy

Prerequisite Skills:
• Calculations with fractions (Items 1, 2, 3) 4.NF.B.3a, 4.NF.B.4c, 3.NF.A.3b
• Calculations with decimals and percents (Items 4, 8) 6.RP.A.3c, 5.NBT.B.7
• Calculations with integers (Items 5,6) 5.NBT.A.2
• Rounding (Item 7) 3.NBT.A.1

Materials:
Optional fee schedules from local financial institutions ; sample credit report

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
31 (Investigative) Using Financial Services – *You Can Bank on It*	Students apply their math knowledge to real-world scenarios to help them understand money management and develop effective practices related to using credit and saving for long-term goals such as a college education.	Lessons 31-1 to 31-3 (3 Lessons)	Aligns with the College and Career Readiness objective of the Common Core State Standards Initiative.

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Unit 1- Number Systems

Prerequisite Skills

- Perform operations with rational numbers (Items 1, 2, 3) 6.NS.B.2, 6.NS.B.3, 7.NS.A.1, 7.NS.A.2.c
- Understand properties of numbers (Item 4) 7.EE.A.1
- Use visual representations (Items 5, 8) 6.NS.C.6
- Understand absolute value (Item 7) 6.NS.C.7
- Order fractions and decimals (Item 6) 6.NS.C.7

Materials:

Paper clips; standard ruler, measuring tape, or meter stick; 8.5" by 11" paper (1 per student); masking tape or painter's tape

Activity or EA	Activity or EA Standards Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
1 (Guided) Operations on Positive Rational Numbers- *Paper Clips, Airplanes, and Spiders*	Students are familiar with operations on whole numbers. In this first activity, they solve real-world problems with positive rational numbers using addition, subtraction, multiplication, and division. They also estimate answers using the four operations to check for reasonableness and justify solutions.	Lessons 1-1 to 1-4 (4 lessons)	**7.NS.A.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. **7.NS.A.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.A.2d** Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
2 (Guided) Addition and Subtraction of Integers- *Elevation Ups and Downs*	Students have reviewed the operations with positive rational numbers. In Activity 2, students use a number line and absolute value to add integers. They then conjecture an algorithm and apply it to add and subtract integers.	Lessons 2-1 and 2-2 (2 Lessons)	**7.NS.A.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. **7.NS.A.1a** Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* **7.NS.A.1b** Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

EA 1 Positive Rational Numbers and Adding and Subtracting Integers – *Off to the Races*	• Operations on decimals • Operations on fractions and mixed numbers • Converting rational numbers to decimals • Find the absolute value of an integer • Compare integers • Add integers • Subtract integers		**7.NS.A.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. **7.NS.A.1a** Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has* 0 *charge because its two constituents are oppositely charged.* **7.NS.A.1b** Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
3 **(Investigative)** Multiplication and Division of Integers- *What's the Sign?*	Students are familiar with operations on whole numbers. In this activity, they solve mathematical and real-world problems with rational numbers using multiplication and division.	Lessons 3-1 and 3-2 (2 Lessons)	**7.NS.A.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers **7.NS.A.2b** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers then - $\frac{p}{q} = \frac{(-p)}{q} = \frac{p}{(-q)}$. Interpret quotients of rational numbers by describing real-world contexts. **7.NS.A.3** Solve real-world and mathematical problems involving the four operations with rational numbers
4 **(Directed)** Operations on Rational Numbers- *Let's be Rational*	Students have reviewed the operations with positive rational numbers. In Activity 4, students first learn to classify subsets of the rational numbers. Then they extend their understanding of operations with integers to positive and negative rational numbers.	Lessons 4-1 to 4-4 (4 Lessons)	**7.NS.A.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. **7.NS.A.1b** Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. **7.NS.A.1c** Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line
EA 2 Rational Number Operations and Multiplying and Dividing Integers- *Top to Bottom*	• Multiply integers • Divide integers • Operations on rational numbers		**7.NS.A.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. **7.NS.A.1b** Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. **7.NS.A.1c** Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

Unit 2- Expressions and Equations

Prerequisite Skills:
• Equations (Item 2) 8.EE.C.7b
• Integers and expressions (Items 3, 4, 5, 6) 6.NS.C.7, 6.EE.A.1, 6.EE.2a, 6.EE.A.2c
• Applications (Items 1, 7, 8) 7.RP.A.2, 7.RP.A.2c, 7.RP.A.3, 7.EE.B.4, 7.G.B.6

Materials:
Two-color counters; graph paper

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
5 (Guided) Properties of Operations- *What's In a Name?*	In earlier grades, students learned the properties of numbers by looking at numerical examples and then generalizing that 2 + 5 = 5 + 2 was clearly true, and so was 4 + 7 = 7 + 4. After observing additional similar examples, it seemed reasonable to conclude that regardless of the order in which you added two numbers, the sum would be the same. Without algebra, however, students were not able to write a single equation that expressed this fact. In this activity, students widen their understanding of what it means to generalize in mathematics by expressing and applying the universal properties of numbers through the use of variables.	Lessons 5-1 and 5-2 (2 Lessons)	**7.EE.A.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. **7.EE.A.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a* + 0.05*a* = 1.05*a means that "increase by* 5%*" is the same as "multiply by* 1.05*."*
6 (Guided) Writing and Solving Equations- *Melody's Music Solution*	Students have written and evaluated expressions to solve real-world problems involving unchanging numerical data. In this activity they move from the concrete to the abstract by using variables to represent quantities that vary, writing equations to describe real-world or mathematical situations, and solving the equations.	Lessons 6-1 and 6-2 (2 Lessons)	**7.EE.A.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a* + 0.05*a* = 1.05*a means that "increase by* 5%*" is the same as "multiply by* 1.05*."* **7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making* $25 *an hour gets a* 10% *raise, she will make an additional* 1/10 *of her salary an hour, or* $2.50*, for a new salary of* $27.50. *If you want to place a towel bar* 9 ¾ *inches long in the center of a door that is* 27 ½ *inches wide, you will need to place the bar about* 9 *inches from each edge; this estimate can be used as a check on the exact computation.*

EA 1 Writing and Solving Equations- *Fundraising Fun*	• Apply Properties of Operations • Model Two-Step Equations • Write Two-Step Equations • Solve Two-Step Equations		**7.EE.A.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. **7.EE.A.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a* + 0.05*a* = 1.05*a means that "increase by* 5%*" is the same as "multiply by* 1.05.*"* **7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
7 **(Guided)** Solving and Graphing Inequalities- *It Plays to Save*	Students continue their study of open number sentences and how to solve them; applying methods they used to solve equations to the solution of one- and two-step inequalities. Students discover that they need to be mindful when multiplying or dividing both sides of an inequality by a negative number, and that solutions of inequalities generally consist of a range of numbers rather than a single number.	Lessons 7-1 and 7-2 (2 Lessons)	**7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making* $25 *an hour gets a* 10% *raise, she will make an additional* 1/10 *of her salary an hour, or* $2.50*, for a new salary of* $27.50*. If you want to place a towel bar* 9 ¾ *inches long in the center of a door that is* 27 ½ *inches wide, you will need to place the bar about* 9 *inches from each edge; this estimate can be used as a check on the exact computation.*
EA 2 Solving Inequalities- *A Gold Medal Appetite*	• Model Two-Step Inequalities • Write Two-Step Inequalities • Solve Two-Step Inequalities		**7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making* $25 *an hour gets a* 10% *raise, she will make an additional* 1/10 *of her salary an hour, or* $2.50*, for a new salary of* $27.50*. If you want to place a towel bar* 9 ¾ *inches long in the center of a door that is* 27 ½ *inches wide, you will need to place the bar about* 9 *inches from each edge; this estimate can be used as a check on the exact computation.* **7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

Unit 3- Ratio and Proportion

Prerequisite Skills:
• Ratios, Tables and Graphs (Item 1, 2, 3) 6.RP.A.3, 6.RP.A.3a
• Expressions and Equations (Items 4, 5) 8.EE.C.7
• Fractions, Decimals and Percents (Items 6, 7, 8) 7.NS.A.2, 5.NF.B.4

Materials:
None

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
8 (Investigative) Ratio and Unit Rates- *Strange, but True*	In previous courses, students have written ratios of two quantities. In Activity 8, students compute the ratio of two quantities with the same units and ratios that compare two different kinds of units, or rates. They also study rates with a denominator of 1, or unit rates.	Lessons 8-1 to 8-3 (3 Lessons)	**7.RP.A.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measures in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour. **7.RP.A.2** Recognize and represent proportional relationships between quantities. **7.RP.A. 2a** Decide whether two quantities are in a proportional relationship, e.g. by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. **7.RP.A.2b** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
9 (Investigative) Proportional Reasoning- *Scrutinizing Coins*	In previous activities, students computed ratios, rates, and unit rates. In Activity 9, students build on these skills to solve problems in the real-world that involve proportional relationships. They find the constant of proportionality from a table, graph, equation, or verbal description of a proportional relationship.	Lessons 9-1 and 9-2 (2 Lessons)	**7.RP.A.2** Recognize and represent proportional relationships between quantities. **7.RP.A.2a** Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. **7.RP.A.2c** Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* **7.RP.A.2d** Explain what a point (*x*, *y*) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r*) where *r* is the unit rate.

EA 1 Ratios, Proportions, and Proportional Reasoning- *Weighing in on Diamonds*	• Solve problems involving proportional relationships • Convert between measurement systems using unit rates and using proportions • Represent constant rates of change with equations of the form *y = kx* • Determine the constant of proportionality from a table, graph, or equation		**7.RP.A.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measures in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour. **7.RP.A.2** Recognize and represent proportional relationships between quantities. **7.RP.A. 2a** Decide whether two quantities are in a proportional relationship, e.g. by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. **7.RP.A.2b** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
10 (Investigative) Proportional Relationships and Scale- *Patriotic Proportions*	In previous activities, students have written equations for proportional relationships given by tables, graphs, and verbal descriptions. In Activity 10, students apply this knowledge to solving problems using scale drawings and finding the actual distance represented by the scale of a map. They also reproduce a scale drawing at a different scale.	Lessons 10-1 to 10-3 (3 Lessons)	**7.RP.A.2** Recognize and represent proportional relationships between quantities. **7.RP.A.2b** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. **7.RP.A.2c** Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* **7.RP.A.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. **7.G.A.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
EA 2 Proportional Relationships and Scale- *Patriotic Proportions*	• Solve problems using scale drawings • Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing • Reproduce a scale drawing at a different scale		**7.RP.A.2** Recognize and represent proportional relationships between quantities. **7.RP.A.2b** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. **7.RP.A.2c** Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* **7.RP.A.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. **7.G.A.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

11 **(Directed)** Percent Problems- *Well, There Is More Than One Way*	Students wrote and solved proportions in previous activities. In Activity 11, students derive the percent equation, percent times whole = part, by first solving proportions. Then they use the percent equation to find the percent of a number, the percent that one number is of another, and the part when given the percent and the whole.	Lessons 11-1 and 11-2 (2 Lessons)	**7.RP.A.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. **7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making* $25 *an hour gets a* 10% *raise, she will make an additional* $\frac{1}{10}$ *of her salary an hour, or* $2.50*, for a new salary of* $27.50*. If you want to place a towel bar* $9\frac{3}{4}$ *inches long in the center of a door that is* $27\frac{1}{2}$ *inches wide, you will need to place the bar about* 9 *inches from each edge; this estimate can be used as a check on the exact computation.*
12 **(Directed)** More Percent Problems- *Like Animals? Have I Got a Job for You!*	In Activity 11, students computed percent using the percent equation. In Activity 12, students use the percent increase equation, % of change= $\frac{\text{difference}}{\text{orginal amount}}$ * 100, to solve percent problems about percent increase, percent decrease, markups, and discounts. They also find interest on a loan and percent error.	Lessons 12-1 to 12-4 (4 Lessons)	**7.RP.A.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. **7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional* $\frac{1}{10}$ *of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar* $9\frac{3}{4}$ *inches long in the center of a door that is* $27\frac{1}{2}$ *inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*
EA 3 Percents and Proportions- *Socializing and Selling*	• Find the percent of a number • Find the percent that one number is of another • Given the percent and the whole, find the part • Solve problems about sales tax, tips, and commissions • Solve problems about percent increase, percent decrease, markups, and discounts • Solve problems about interest and percent error		**7.RP.A.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. **7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making* $25 *an hour gets a* 10% *raise, she will make an additional* $\frac{1}{10}$ *of her salary an hour, or* $2.50*, for a new salary of* $27.50*. If you want to place a towel bar* $9\frac{3}{4}$ *inches long in the center of a door that is* $27\frac{1}{2}$ *inches wide, you will need to place the bar about* 9 *inches from each edge; this estimate can be used as a check on the exact computation.*

Unit 4- Geometry

Prerequisite Skills:
• Understand ratios (Item 1) 6.RP.A.3
• Solve equations (Item 2) 7.EE.B.3, 7.EE.B.4
• Classify geometric figures (Items 3, 6, 7, 8) 2.G.A.1, 3.G.A.1, 4.G.A.1, 4.G.A.2, 7.G.A.2
• Find area of figures (Items 4, 5) 6.G.A.1, 7.G.B.4

Materials:
Dot paper; grid paper; index cards; model prisms; model pyramids; metric ruler; protractor; scissors; straws; string; tape; unit cubes; prisms; metric measuring tape; coins; paper plates; cups; lids

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
13 (Guided) Angle Pairs- *Some of the Angles*	In previous grades, students learned that an angle is a figure formed by two rays meeting at a common endpoint. They classify angles by their measure and distinguish them from related geometric figures such as triangles and polygons. In Activity 13, students begin to distinguish among various types of angles and classify them by their relationships with other angles.	Lesson 13-1 and 13-2 (2 Lessons)	**7.G.B.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
14 (Guided) Triangle Measurements- *Rigid Bridges*	Until now, students' study of geometric shapes has largely been confined to lower-order knowledge levels— identifying and classifying triangles and angles, measuring, solving equations and routine multi-step problems. In Activity 14 they move beyond the routine to assess whether certain triangles are possible, and to explain why some are not.	Lessons 14-1 and 14-2 (2 Lessons)	**7.G.A.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
EA 1 Angles and Triangles- *Pool Angles*	• Adjacent, vertical, complementary, and supplementary angles • Angles of a triangle		**7.G.A.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. **7.G.B.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

15 (Guided) Similar Figures- *The Same but Different*	Students have learned that a ratio is a comparison of two numbers and that a proportion is an equation equating two ratios. Ratios are useful in finding rates and unit rates and, especially, when they can be used to write a proportion which can be used to find a missing variable. In this activity, students apply ratios and proportions to learn whether figures are similar and, if they are, to calculate the measures of missing angles and sides.	Lessons 15-1 and 15-2 (2 Lessons)	**7.G.A.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
16 (Investigative) Circles: Circumference and Area – *Gardens Galore*	In earlier grades, students learned basic facts about plane figures–how to classify them, distinguish them from one another, and, in certain cases, find their perimeters and areas. In this unit they examined more challenging topics: What conditions determine a unique triangle? How can you find a missing side of a triangle if it is similar to a triangle whose sides you know? In this activity, students learn how to find the circumference and area of a circle, the first figure with curved sides they have dealt with. This leads to the introduction of the number Pi whose digits, students are informed, "never end or repeat."	Lessons 16-1 and 16-2 (2 Lessons)	**7.G.B.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
17 (Investigative) Composite Area- *Tile Designs*	Until now, students' study of geometric shapes has largely been confined to identifying polygons by the number of sides or the measure of their angles, and then finding the areas of the polygons. In Activity 17 they move on to finding the area and perimeter (and circumference) of two-dimensional shapes that are composites of polygons.	Lessons 17-1 and 17-2 (2 Lessons)	**7.G.B.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. **7.G.B.6** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

EA 2 Circumference and Area- *In the Paint*	• Area of rectangles and circles • Area of composite plane shapes		**7.G.A.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. **7.G.B.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. **7.G.B.6** Solve real-world and mathematical problems involving area, volume and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
18 **(Investigative)** Sketching Solids- *Putt-Putt Perspective*	Until now, students have applied area formulas to known geometric shapes in two dimensions. In Activity 18 they move on to finding the surface area of three-dimensional shapes. They learn the terminology associated with solids, how to find the cross section of solids, and how to find the lateral area and surface area of right prisms and pyramids.	Lessons 18-1 to 18-3 (3 Lessons)	**7.G.A.3** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. **7.G.B.6** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
19 **(Investigative)** Volume- Prisms and Pyramids – *Berneen Wick's Candles*	Until now, students have applied volume formulas to simple solids. In Activity 19 they move on to finding the volume of prisms, pyramids, and the complex solids formed when two or more solids are put together.	Lesson 19-1 and 19-2 (2 Lessons)	**7.G.B.6** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
EA 3 Surface Area and Volume- *Under the Sea*	• Nets for a prism • Surface area of a prism • Cross section of a solid		**7.G.A.3** Describe the two-dimensional figures that result from slicing three-dimensional figures as in plane sections of right rectangular prisms and right rectangular pyramids. **7.G.B.6** Solve real-world and mathematical problems involving area, volume and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Unit 5- Probability

Prerequisite Skills
• Fractions, decimals and percents (Items 2, 3) 7.NS.A.2b, 7.NS.A.3
• Equivalent Fractions (Item 1) 3.NF.A.3b
• Representation of fractions (Item 4) 2.G.A.3

Materials:
Paper clips; poster-size chart paper; pennies or colored chips

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
20 (Investigative) Exploring Probability – *Spinner Games*	Until now, students' study of probability has largely been focused on data provided to students. In Activity 20, students begin to develop a sense of experimental probability and the notion of a chance experiment, which is introduced more formally later.	Lessons 20-1 to 20-4 (4 Lessons)	**7.SP.C.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. **7.SP.C.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*
21 (Investigative) Probability- *Probability Two Ways*	Students begin to calculate and compare experimental and theoretical probabilities. They will continue to observe frequencies in data generated randomly, and relate those observations to the expected outcomes.	Lessons 21-1 to 21-3 (3 Lessons)	**7.SP.C.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. **7.SP.C.7a** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.* **7.SP.C.7b** Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*
EA 1 Finding Probabilities – *Spinning Spinners and Random Picks*	• Anticipate outcomes based on a probability model • Reason about plausible probability models given observed outcomes. • Calculate theoretical probabilities for a probability experiment that has equally likely outcomes (a uniform probability model) • Estimate probabilities		**7.SP.C.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. **7.SP.C.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.* **7.SP.C.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

22 (Investigative) Games and Probability – *Rock, Paper, Scissors…. and Other Games*	Now that students are more familiar with experimental and theoretical probability, they can begin to use tables and tree diagrams to represent possible outcomes. They will extend their knowledge and compute probabilities for different outcomes in a sample space.	Lessons 22-1 to 22-4 (4 Lessons)	**7.SP.C.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **7.SP.C.8a** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. **7.SP.C.8b** Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.
23 (Guided) Probability- *Estimating Probabilities Using Simulation*	Once students are comfortable with simple and compound events and how to use simulations for outcomes, they can design and carry out their own simulations. They will also use these simulations to estimate the probability of simple and compound events.	Lessons 23-1 to 23-4 (4 Lessons)	**7.SP.C.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **7.SP.C.8c** Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*
EA 2 Probability and Simulation- *Flipping Coins and Random Choices*	• Use tables and tree diagrams to represent outcomes • Use a tree diagram to assign probabilities to outcomes in the sample space • Reason about equally likely outcomes • Plan a simulation for a given probability experiment • Use simulation to estimate Probabilities		**7.SP.C.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **7.SP.C.8a** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. **7.SP.C.8b** Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. **7.SP.C.8c** Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*

Unit 6- Statistics

Prerequisite Skills:
• Measures of Center (Item 1) 6.SP.B.5c
• Quartiles (Items 2, 3) 6.SP.B.5c
• Box plots and dot plots (Items 4, 5) 6.SP.B.4
• Mean Absolute Deviation (Item 6) 6.SP.B.5c

Materials:
Calculator; paper clips; pencils; poster-size chart paper; small paper bags; red and white plastic beads

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
24 (Investigative) Statistics- *Summer Reading Club*	Students collected and summarized data in previous grades where the population of interest was usually just their class, and data were collected for the entire class—a census. In this activity, students continue their study of statistics by analyzing data and exploring the difference between a whole population and a sample. Students will investigate sampling, and develop an understanding of the "fairness" of random sampling.	Lessons 24-1 and 24-2 (2 Lessons)	**7.SP.A.1** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
25 (Guided) Exploring Sampling Variability – *Sample Speak*	In this activity, students continue their study of statistics by using data from a random sample to make inferences and draw conclusions about a population of interest. Moreover, students explore sampling variability and its implications.	Lessons 25-1 and 25-2 (2 Lessons)	**7.SP.A.2** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*

EA 1 Random Sampling and Sampling Variability – *School Populations*	• Determine methods for selecting a random sample • Identify sampling variability • Use data from a sample to draw a conclusion about a population		**7.SP.A.1** Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. **7.SP.A.2** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be*.
26 (Investigative) Comparative Statistics- *Seventh- Grade Students*	In this activity, students continue their exploration of sampling variability to understand its role when comparing populations. Students will examine population means and compare sample means of random samples, expressing the difference in terms of the mean average deviation (MAD).	Lessons 26-1 to 26-3 (3 Lessons)	**7.SP.B.3** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is* 10 *cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.* **7.SP.B.4** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*
EA 2	• Understand sampling variability • Use data from random samples to compare populations		**7.SP.B.3** Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is* 10 *cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.* **7.SP.B.4** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*

Unit 7- Personal Financial Literacy

Prerequisite Skills:
• Equivalent fractions (Items 1, 2) 3.NF.A.3, 3.NF.A.3a, 3.NF.A.3b
• Fractions, decimals, percents (Items 3, 7) 5.NBT.A.3, 7.NS.A.2
• Operations with decimals (Items 4, 5,6) 7.NS.A.2c

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
27 (Directed) Budgeting and Money Management- *How Much is Too Much?*	Students apply their math knowledge to real-world scenarios to help them understand money management and develop effective practices related to using credit and saving for long-term goals such as a college education.	Lessons 27-1 and 27-2 (2 Lessons)	Aligns with the College and Career Readiness objective of the Common Core State Standards Initiative.

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Unit 1- Numerical Relationships

Prerequisite Skills
• Decimals (Items 1, 2) 6.NS.B.3, 6.NS.C.7
• Representations of rational numbers (Items 3,4, 5, 7) 3.NF.A.3, 6.NS.C.6
• Number Systems (Item 6) 6.NS.C.6
• Properties (Item 8) 6.EE.A.3

Activity or EA	Activity or EA Standards Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
1 (Investigative) Investigating Patterns – *Laws and Order*	In Activity 1, students learn to analyze sequences. They also describe patterns in sequences, give the next terms in a sequence, and develop methods for predicting any term in a sequence. Finally, they learn to understand increasing and decreasing sequences and to analyze sequences containing mathematical operations, as well as those based on other patterns.	Lessons 1-1 to 1-3 (3 Lessons)	This Activity builds foundations for Grade 8 CC Standards. Use for reinforcement and to fill in transition gaps.
2 (Guided) Operations with Fractions – *And the Beat Goes On*	In Activity 2, students add, subtract, multiply and divide fractions. They work with fractions as improper fractions and as mixed numbers. Students solve real-world and mathematical problems involving fractions, while exploring the connections between fractional math and music.	Lessons 2-1 and 2-2 (2 Lessons)	This Activity builds foundations for Grade 8 CC Standards. Use for reinforcement and to fill in transition gaps.
EA 1 Patterns and Quantitative Reasoning- *Game On*	• Recognize patterns • Compute with mixed fractions to solve real-world problems		This EA evaluates foundations for Grade 8 CC Standards. Use for reinforcement and to fill in transition gaps.

3 (Directed) Powers and Roots- *Squares and Cubes*	Students should have already mastered repeated multiplication of signed numbers, fractions, and decimals. In this activity, powers and roots are explored using area and volume as models.	Lessons 3-1 and 3-3 (3 Lessons)	**8.NS.A.1** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. **8.EE.A.2** Use square root and cube root symbols to represent solutions to equations of the form $X^2 = p$ and $X^3 = p$, where *p* is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
4 (Guided) Rational Numbers- *Know When to Fold 'Em*	In Activity 2, students learned to add, subtract, multiply, and divide rational numbers. These skills were built upon in Activity 3 with the order of operations. In this activity, students formalize the definition of a rational number, and convert between its various forms.	Lessons 4-1 to 4-3 (3 Lessons)	**8.NS.A.1** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
5 (Guided) Rational and Irrational Numbers- *Where Am I?*	In this activity, students become familiar with the idea of irrational numbers. They learn to differentiate between rational and irrational numbers. They approximate an irrational number in terms of a rational number, and they compare and order irrational and rational numbers.	Lessons 5-1 and 5-2 (2 Lessons)	**8.NS.A.2** Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g.,π^2). *For_example, by truncating the decimal expansion of* $\sqrt{2}$ *, show that* $\sqrt{2}$ i*s between* 1 *and* 2*, then between* 1.4 *and* 1.5*, and explain how to continue on to get better approximations.* **8.EE.A.2** Use square root and cube root symbols to represent solutions to equations of the form $X^2 = p$ and $X^3 = p$, where *p* is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
EA 2 Representing Rational and Irrational Numbers- *Weather or Not?*	• Convert between fractions, decimals, and percents • Determine square roots and cube roots of perfect squares and perfect cubes • Distinguish between rational and irrational numbers		**8.NS.A.1** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. **8.NS.A.2** Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g.,π^2). *For example, by truncating the decimal expansion of* $\sqrt{2}$ *, show that* $\sqrt{2}$ i*s between* 1 *and* 2*, then between* 1.4 *and* 1.5*, and explain how to continue on to get better approximations.* **8.EE.A.2** Use square root and cube root symbols to represent solutions to equations of the form $X^2 = p$ and $X^3 = p$, where *p* is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

6 (Directed) Properties of Exponents- *That's a Lot of Cats*	In this activity, students will learn and apply properties of integer exponents. They will simplify products and quotients with integer exponents (both those with numeric and with variable bases), and they will learn to work with negative exponents. This will establish a basis of knowledge which they will call upon in the next activity when working with scientific notation.	Lessons 6-1 to 6-3 (3 Lessons)	**8.EE.A.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example*, $3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$.
7 (Guided) Scientific Notation – *A Traveler's Tale*	In this activity, students are introduced to scientific notation, a concept they will need to be well-grounded in as they go forward in their math and science studies. Here students will express numbers in scientific notation, and convert from scientific notation to standard form and vice versa. They will also compare and order numbers in scientific notation, both very large numbers and very small numbers.	Lessons 7-1 and 7-2 (2 Lessons)	**8.EE.A.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as* 3 *times* 10^8 *and the population of the world as* 7 *times* 10^9*, and determine that the world population is more than* 20 *times larger.*
8 (Guided) Operations and Scientific Notation- *How Big is That Planet?*	In this activity students add, subtract, multiply, and divide numbers written in scientific notation, using several different methods. They use these methods to solve real-world problems, with a focus on astronomy and the solar system.	Lessons 8-1 and 8-2 (2 Lessons)	**8.EE.A.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as* 3 *times* 10^8 *and the population of the world as* 7 *times* 10^9*, and determine that the world population is more than* 20 *times larger.* **8.EE.A.4** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
EA 3 Exponents and Scientific Notation- *Contagious Mathematics*	• Compute with exponents • Write a number in scientific notation • Recognize exponential number patterns		**8.EE.A.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example*, $3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$. **8. EE.A.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as* 3 *times* 10^8 *and the population of the world as* 7 *times*10^9*, and determine that the world population is more than* 20 *times larger.* **8.EE.A.4** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Unit 2- Equations

Prerequisite Skills

- Expressions and Equations (Items 1, 2, 3) 6.EE.A.2
- Coordinate Plane (Items 5, 6, 7) 6.NS.C.6c
- Tables of Values (Item 4) 6.RP.A.3a
- Similar Triangles (Item 8) 8.G.A.4

Materials:

balance scale (optional); small paper cups (optional); centimeter cubes (optional); 16-oz. water bottles; large cup or bucket; ruler or tape measure; tool to poke hole in bottle (scissors, end of metal compass, or nail); stop watch

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
9 (Investigative) Writing Expressions – *Pebbles in the Sand*	Unit 2 focuses on linear equations. Activity 9 introduces some of the ideas that will be needed when analyzing equations by first looking at those ideas in the context of *patterns*. Before they see algebraic equations, students will be introduced to algebraic expressions as they use them to identify and represent patterns. They will write and evaluate algebraic expressions that represent patterns—some with constant differences and some without. This idea of *constant difference* will serve as an introduction to the concepts they will come to understand in later activities as *rate of change* and *slope*.	Lessons 9-1 and 9-2 (2 Lessons)	This Activity builds foundations for Grade 8 CC Standards. Use for reinforcement and to fill in transition gaps.
10 (Guided) Solving Equations- *Cups and Cubes*	In this activity, students examine the concept of an equation, using a scale and the idea of "balance" as a model. They use various techniques—the Distributive Property, combining like terms, and especially inverse operations—to simplify and solve linear equations in one variable. And they use linear equations to model and solve real-world and mathematical problems.	Lessons 10-1 and 10-2 (2 Lessons)	**8.EE.C.7** Solve linear equations in one variable. **8.EE.C.7a** Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). **8.EE.C.7b** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

EA 1 Expressions and Equations- *What a Good Idea!*	• Write linear equations • Solve linear equations		**8.EE.C.7** Solve linear equations in one variable. **8.EE.C.7a** Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). **8.EE.C.7b** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
11 **(Investigative)** Exploring Slope- High Mountain Ratio	This activity deals with the connections between proportional relationships, lines and linear equations. Here students develop their understanding of slope as rate of change and as a ratio. They will graph proportional relationships, determine slope and *y*-intercept from graphs, and interpret slope and *y*-intercept in the context of real-world and mathematical problems.	Lessons 11-1 and 11-2 (2 Lessons)	**8.EE.B.5** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.* **8.EE.B.6** Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
12 **(Investigative)** Slope-Intercept Form- *Leaky Bottle*	In Activity 12, students work with linear relationships presented in various forms. They gain experience in both graphing equations of the form $y = mx + b$ and in deriving such equations from their graphs. They learn to recognize and determine slope and *y*-intercept from graphs and equations of linear relationships, and to use slope and *y*-intercept to graph lines. Finally, students examine real-life examples of linear relationships and interpret slope and *y*-intercept in the context of those examples.	Lessons 12-1 to 12-3 (3 Lessons)	**8.EE.B.5** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.* **8.EE.B.6** Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
13 **(Guided)** Proportional Relationships – *Vary Interesting*	In this activity, students represent linear proportional relationships with tables, graphs and equations. They identify slope and *y*-intercept in equations and graphs, and interpret their meaning in problem contexts. Students also solve problems involving direct variation. Finally, they distinguish between proportional and non-proportional relationships.	Lessons 13-1 and 13-2 (2 Lessons)	**8.EE.B.5** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*

EA 2 Linear Equations and Rates of Change- *Who Is That?*	• Determine and interpret rate of change • Write linear equations		**8.EE.B.5** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.* **8.EE.B.6** Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
14 **(Guided)** Graphing Systems of Linear Equations – *System of Trees*	In this activity, students will solve systems of linear equations graphically and algebraically, while recognizing that the point of intersection represents the solution to the system. Students will also use systems of linear equations to solve real-world and mathematical problems.	Lessons 14-1 and 14-2 (2 Lessons)	**8.EE.C.8** Analyze and solve pairs of simultaneous linear equations. **8.EE.C.8a** Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. **8.EE.C.8b** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example,* $3x + 2y = 5$ *and* $3x + 2y = 6$ *have no solution because* $3x + 2y$ *cannot simultaneously be* 5 *and* 6*.* **8.EE.C.8c** Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*
15 **(Directed)** Solving Systems of Linear Equations Algebraically- *What's the Point?*	In the previous Activity, students solved linear systems by graphing. In Activity 15, students apply their algebra skills to solve linear systems algebraically, including application problems.	Lessons 15-1 and 15-2 (2 Lessons)	**8.EE.C.8** Analyze and solve pairs of simultaneous linear equations. **8.EE.C.8a** Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. **8.EE.C.8b** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example,* $3x + 2y = 5$ *and* $3x + 2y = 6$ *have no solution because* $3x + 2y$ *cannot simultaneously be* 5 *and* 6. **8.EE.C.8c** Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*
EA 3 Solving Systems of Linear Equations- *Supply and Demand*	• Solve systems of linear equations graphically • Solve systems of linear equations algebraically		**8.EE.C.8** Analyze and solve pairs of simultaneous linear equations. **8.EE.C.8a** Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. **8.EE.C.8b** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example*, $3x + 2y = 5$ *and* $3x + 2y = 6$ *have no solution because* $3x + 2y$ *cannot simultaneously be* 5 *and* 6. **8.EE.C.8c** Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*

Unit 3- Geometry

Prerequisite Skills:
• Coordinate Plane (Items 1, 2) 6.NS.C.6c
• Triangles (Item 3) 4.G.A.2
• Ratio and Proportion (Items 4, 5) 6.RP.A.3, 7.RP.A.3
• Perimeter and Area (Items 6, 7, 8) 6.G.A.1, 7.G.B.4, 7.G.B.6

Materials:
Blackline masters; calculators; graph paper; index cards; masking tape; paper clips; pictures/models of rectangular prisms and pyramids; protractor; rulers; scissors; shoebox; small mirrors; sticky notes; tape measures; timer

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
16 (Guided) Angle-Pair Relationships- *The Winning Angle*	In this activity, students establish facts about angle pairs, including complementary, supplementary, and vertical angles. Students also investigate and apply the relationships among angle pairs when parallel lines are cut by a transversal.	Lessons 16-1 and 16-2 (2 Lessons)	**8.G.A.5** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*
17 (Investigative) Angles of Triangles and Quadrilaterals- *The Parallel Chute*	In this activity, students investigate and apply the fact that the sum of the measures of the angles in a triangle is 180°. Students also describe the relationship between an exterior angle of a triangle and its remote interior angles, and the relationship among the angles of a quadrilateral.	Lessons 17-1 and 17-2 (2 Lessons)	**8.G.A.5** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*
EA 1 Angle Measures- *Light and Glass*	• Identify and determine the measures of complementary and supplementary angles • Determine the measures of the angles of a triangle or quadrilateral • Determine the measures of the angles formed by parallel lines that are cut by a transversal		**8.G.A.5** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*

18 (Investigative) Introductions to Transformations- *Move It!*	In Activity 18, students work with transformations, including transformations on the coordinate plane. A key element of this activity is using correct terminology and accurate symbolic representations to describe transformations. In this activity, students work with translations, reflections, and rotations, all of which are rigid motions. Later, in Activity 21, students will be introduced to dilations, which are an example of a non-rigid motion.	Lessons 18-1 to 18-4 (4 Lessons)	**8.G.A.1** Verify experimentally the properties of rotations, reflections, and translations: **8.G.A.1a** Lines are taken to lines, and line segments to line segments of the same length. **8.G.A.1b** Angles are taken to angles of the same measure. **8.G.A.1c** Parallel lines are taken to parallel lines. **8.G.A.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
19 (Investigative) Rigid Transformations and Compositions- *All the Right Moves*	Students have already been introduced to basic notation and terminology for transformations. In this activity, students investigate properties of transformations and explore the connection between congruence and translations, reflections, and rotations. Students also work with compositions of transformations in this activity.	Lessons 19-1 and 19-2 (2 Lessons)	**8.G.A.1** Verify experimentally the properties of rotations, reflections, and translations: **8.G.A.1a** Lines are taken to lines, and line segments to line segments of the same length. **8.G.A.1b** Angles are taken to angles of the same measure. **8.G.A.1c** Parallel lines are taken to parallel lines. **8.G.A.2** Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. **8.G.A.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
EA 2 Rigid Transformations- *In Transformations We Trust*	• Perform translations, reflections, and rotations on the coordinate plane • Identify transformations that preserve congruence		**8.G.A.1** Verify experimentally the properties of rotations, reflections, and translations: **8.G.A.1a** Lines are taken to lines, and line segments to line segments of the same length. **8.G.A.1b** Angles are taken to angles of the same measure. **8.G.A.1c** Parallel lines are taken to parallel lines. **8.G.A.2** Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. **8.G.A.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
20 (Guided) Similar Triangles- *Mirrors and Shadows*	In this activity, students develop an understanding of similarity, especially as it applies to similar triangles. Students identify corresponding sides and angles in similar triangles, and use properties of the sides and angles of similar triangles to solve real-world and mathematical problems.	Lessons 20-1 and 20-2 (2 Lessons)	**8.G.A.5** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*

21 (Guided) Dilations – *Alice's Adventures in Shrinking and Growing*	In earlier activities, students explored transformations that are rigid motions (translations, reflections, and rotations). In this activity, students expand their understanding of transformations to include a non-rigid motion. Specifically, students explore the effects of dilation, and learn how to determine the scale factor of dilation.	Lessons 21-1 and 21-2 (2 Lessons)	**8.G.A.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. **8.G.A.4** Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
EA 3 Similarity and Dilations- *Business as Usual*	• Identify similar figures and find unknown measures • Perform dilations on the coordinate plane • Find perimeters and areas of similar figures		**8.G.A.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. **8.G.A.4** Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. **8.G.A.5** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*
22 (Guided) The Pythagorean Theorem- *Stop the Presses*	In this activity, students investigate one of the most important theorems in mathematics, the Pythagorean Theorem. Students explore a proof of the theorem and then use the theorem to find unknown side lengths in right triangles. Note that additional applications of the theorem are covered in Activity 23, and students explore the converse of the theorem in Activity 24.	Lessons 22-1 and 22-2 (2 Lessons)	**8.G.B.6** Explain a proof of the Pythagorean Theorem and its converse. **8.G.B.7** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. **8.G.B.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
23 (Guided) Applying the Pythagorean Theorem – *Diamond in the Rough*	In this activity, students apply the Pythagorean Theorem to solve problems in two and three dimensions. Students also use the Pythagorean Theorem on the coordinate plane in order to find the distance between a pair of given points.	Lessons 23-1 and 23-2 (2 Lessons)	**8.G.B.6** Explain a proof of the Pythagorean Theorem and its converse. **8.G.B.7** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. **8.G.B.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

24 (Investigative) Converse of the Pythagorean Theorem – *Paper Clip Chains*	This activity gives students a chance to investigate and apply the converse of the Pythagorean Theorem. Students also identify and create sets of whole numbers that are Pythagorean triples.	Lessons 24-1 and 24-2 (2 Lessons)	**8.G.B.6** Explain a proof of the Pythagorean Theorem and its converse. **8.G.B.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
EA 4 The Pythagorean Theorem *Camp Euclid*	• Solve problems using the Pythagorean Theorem • Use the converse of the Pythagorean Theorem		**8.G.B.6** Explain a proof of the Pythagorean Theorem and its converse. **8.G.B.7** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. **8.G.B.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
25 (Guided) Surface Area- *Greenhouse Gardens*	In this activity, students calculate lateral and surface areas of prisms and cylinders. Students gain experience working with surface areas in purely mathematical problems and in problems that arise from real-world situations.	Lessons 25-1 and 25-2 (2 Lessons)	
26 (Guided) Volume of Solids- *Castles in the Sand*	In this activity, students apply the formula for the volume of a prism, pyramid, cylinder, cone, and sphere in a variety of mathematical and real-world situations. Students also apply what they have learned to find the volume of composite solids.	Lessons 26-1 to 26-3 (3 Lessons)	**8.G.C.9** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
EA 5 Surface Area and Volume- *Air Dancing*	• Calculate the surface area and lateral area of three-dimensional figures • Calculate the volume of three dimensional figures, including composite solids		**8.G.C.9** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Unit 4- Functions

Prerequisite Skills

• Ordered pairs and the coordinate plane (Items 2, 3, 4) 6.EE.C.9
• Linear relationships. (Items 5, 6, 7) 6.EE.C.9, 7.EE.B.4a
• Visual representations (Items 1, 8) 6.EE.C.9

Materials:

Scissors; tape or glue; bean; paper cup; ruler; string; spring; unifix cubes or other weights

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
27 (Guided) Introduction to Functions – *It's All Related*	In this activity, students begin to work with functions. Students are first introduced to relations, which are sets of ordered pairs, and then learn that functions are a special type of relation. Students also gain experience in representing, evaluating, and graphing functions.	Lessons 27-1 to 27-4 (4 Lessons)	**8.F.A.1** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
28 (Investigative) Comparing Functions- *Which Car Wins?*	Students compare functions that are represented in different ways, including algebraically, graphically, verbally, and in tables. Students also learn to identify examples of proportional and nonproportional functions that arise from mathematical and real-world problems.	Lessons 28-1 and 28-2 (2 Lessons)	**8.F.A.2** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*
29 (Guided) Constructing Functions- *Hold On to Your Hats*	In this activity, students construct a function to model a linear relationship between two quantities. They determine the rate of change and initial value of the function from a description or from given values. Students also interpret the rate of change and the initial value, and they distinguish between proportional and non-proportional functions that arise from real-world and mathematical situations.	Lessons 29-1 and 29-2 (2 Lessons)	**8.F.A.3** Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s2$ giving the area of a square as a function of its side length is not linear because its graph contains the points* (1,1), (2,4) *and* (3,9), *which are not on a straight line.*

EA 1 Functions- *Remember When?*	• Determine whether a relation is a function • Determine whether a function is a proportional function • Represent functions in different ways		**8.F.A.1** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. **8.F.A.2** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.* **8.F.A.3** Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points* (1,1), (2,4) *and* (3,9), *which are not on a straight line.*
30 **(Guided)** **Linear Functions-** *Get in Line*	In this activity, students calculate the rate of change from a table and use the rate of change to identify linear functions. Students also learn to model linear relationships and create a variety of representations for linear functions.	Lessons 30-1 and 30-2 (2 Lessons)	**8.F.B.5** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
31 **(Investigative)** Linear and Non-Linear Functions – *Measure Up*	In this activity, students conduct experiments and use functions to model relationships between quantities. They describe the functional relationship between two quantities by analyzing a graph and they sketch a graph that represents a function that has been described verbally. Students also use a trend line showing the relationship between sets of data to make predictions.	Lessons 31-1 to 31-3 (3 Lessons)	**8.F.A.3** Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points* (1,1), (2,4) *and* (3,9), *which are not on a straight line.* **8.F.B.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
EA 2 Scatter Plots and Trend Lines *Geographically Speaking*	• Create and interpret a scatter plot • Use a trend line to make a prediction • Identify linear equations		**8.F.A.3** Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points* (1,1), (2,4) *and* (3,9), *which are not on a straight line.* **8.F.B.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. **8.F.B.5** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Unit 5- Probability and Statistics

Prerequisite Skills:
• Coordinate plane (Items 1, 2) 6.NS.C.6c, 6.EE.C.9
• Linear equations. (Items 3, 4, 5) 6.EE.C.9
• Data (Item 6) 7.SP.A.2
• Equivalent forms of numbers (Items 7, 8) 4.NF.C.6, 7.NS.A.2d, 7.RP.A.3

Materials:
Multiple dolls of similar size and weight; a rock/weight for each doll; rubber bands (new); meter sticks or tape measures; graph paper; calculator

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
32 (Investigative) Scatter Plots and Association – *Cracker Snacker*	Students have explored, graphed, and interpreted data displays such as dot plots, histograms, and box plots in earlier grades. In Activity 32, students continue their study of data displays by constructing and analyzing scatter plots from data.	Lessons 32-1 and 32-2 (2 Lessons)	**8.SP.A.1** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. **8.SP.A.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. **8.SP.A.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of* 1.5 *cm/hr as meaning that an additional hour of sunlight each day is associated with an additional* 1.5 *cm in mature plant height.*
33 (Investigative) Bivariate Data- *Sue Swandive*	Students learned to make and interpret scatter plots in the Activity 32. In Activity 33, students will conduct an experiment and collect real-world data in the context of a competition. They will display the data in a scatter plot and describe the association between the two variables of the experiment with appropriate statistical vocabulary.	Lessons 33-1 to 33-3 (3 Lessons)	**8.SP.A.1** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. **8.SP.A.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. **8.SP.A.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of* 1.5 *cm/hr as meaning that an additional hour of sunlight each day is associated with an additional* 1.5 *cm in mature plant height.*

EA 1 Scatter Plots, Associations, and Trends- *U.S. Census*	• Generate a scatter plot from data collected from a random sample • Describe the association between variables of a scatter plot • Write and interpret a trend line		**8.SP.A.1** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. **8.SP.A.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. **8.SP.A.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of* 1.5 *cm/hr as meaning that an additional hour of sunlight each day is associated with an additional* 1.5 *cm in mature plant height.*
34 **(Investigative)** Median-Median Line- *Homework Help Line*	Students learned to make scatter plots in Activity 32 and informally fit trend lines in Activity 33. In Activity 34, students will find and use specific linear form, the median-median line, for a set of data.	Lessons 34-1 and 34-2 (2 Lessons)	**8.SP.A.1** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. **8.SP.A.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. **8.SP.A.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of* 1.5 *cm/hr as meaning that an additional hour of sunlight each day is associated with an additional* 1.5 *cm in mature plant height.*
35 **(Investigative)** Two-Way Tables and Association- *Student Opinions*	Students have described associations in tables of data using scatter plots in previous activities. In Activity 35, students read and analyze two-way tables. They find relative frequencies. Association in these types of tables is shown by constructing segmented bar graphs.	Lessons 35-1 and 35-2 (2 Lessons)	**8.SP.A.1** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. **8.SP.A.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. **8.SP.A.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of* 1.5 *cm/hr as meaning that an additional hour of sunlight each day is associated with an additional* 1.5 *cm in mature plant height.*
EA 2 Median-Median Line and Two-Way Tables – *Mokher's Measurements*	• Write and use the median-median line • Compute row percentages for a two-way table • Create a segmented bar graph • Determine association in a two-way table		**8.SP.A.1** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. **8.SP.A.2** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. **8.SP.A.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of* 1.5 *cm/hr as meaning that an additional hour of sunlight each day is associated with an additional* 1.5 *cm in mature plant height.*

Unit 6- Personal Financial Literacy

Prerequisite Skills:
• Fractions, decimals, percents (Items 2, 3, 4) 4.NF.C.6, 7.NS.A.2d, 7.RP.A.3
• Operations with decimals and percents (Items 5, 6, 7, 8) 6.NS.B.3

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
36 (Guided) Managing Money- *To Charge or Not*	Students apply their math knowledge to real-world scenarios to help them understand the cost of credit, as well as estimating future college costs and making a plan for long-term savings for goals such as college or retirement.	Lessons 36-1 and 36-2 (2 Lessons)	Aligns with the College and Career Readiness objective of the Common Core State Standards Initiative.

Answers
Teacher Copy

Unit 1 | Equations and Inequalities

Unit 1: Equations and Inequalities

In this Unit, students recognize and generalize patterns using words, tables, expressions, and graphs. Students will also generate rules for solving simple linear equations and inequalities, as well as absolute value equations and inequalities. p. 1a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 1 develops concepts that engender a solid algebraic foundation by:

- Developing pattern recognition necessary for success in AP Statistics.
- Providing a constructivist approach to solving equations, enabling students to compare and evaluate multiple methods of solution.
- Allowing for an intuitive understanding of absolute value and methods for solving equations and inequalities involving absolute value.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Patterns and Equations, *Of Music and Money*

- Identify patterns
- Model patterns with expressions
- Use patterns to make predictions
- Write, solve, and interpret multi-step equations
- Solve literal equations for a variable

Embedded Assessment 2

Inequalities and Absolute Value, *Diet and Exercise*

- Write, solve, and graph inequalities
- Write and graph compound inequalities
- Solve and graph absolute value inequalities

Suggested Pacing

p. 1b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 1	2	
Activity 2	5	
Embedded Assessment 1	1	
Activity 3	3	
Activity 4	2	
Embedded Assessment 2	1	
Total 45-Minute Periods	**15**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the eBook Teacher Resources.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 2	Functions

Unit 2: Functions

In this unit, students study functions and function concepts, including domain, range, slope as rate of change, and intercepts. Students write linear functions given a point and a slope, two points, a table of values, an arithmetic sequence, or a graph. They collect and model data with linear, quadratic, or exponential functions. p. 63a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

Algebra / AP / College Readiness

Unit 2 continues to hone student understanding of function by:

- Formalizing the language of functions.
- Making the connection that the slope of a line represents a constant rate-of-change.
- Exploring functions and linear functions and their behavior in a variety of ways: numerical, graphical, analytical, and verbal.
- Collecting data and modeling with a linear, quadratic, or exponential function.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Representations of Functions, *Bryce Canyon Hiking*

- Identify functions and use function notation
- Interpret key features of graphs

Embedded Assessment 2

Linear Functions and Equations, *Text Message Plans*

- Model with, write, and use linear functions
- Identify a best-fit situation

Embedded Assessment 3

Linear Models and Slope as Rate of Change, *A 10K Run*

- Make a scatter plot and perform a linear regression
- Interpret slope in a real-world context

Suggested Pacing

p. 63b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 5	3	
Activity 6	3	
Activity 7	3	
Activity 8	2	
Embedded Assessment 1	1	
Activity 9	1	
Activity 10	3	
Activity 11	4	
Embedded Assessment 2	1	
Activity 12	4	
Activity 13	3	
Embedded Assessment 3	1	
Total 45-Minute Periods	**30**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the eBook Teacher Resources.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 3 | Extensions of Linear Concepts

Unit 3: Extensions of Linear Concepts

In this unit, students continue their study of linear concepts by learning about piecewise-defined linear functions, linear inequalities with one and two variables, and systems of linear equations and inequalities. p. 209a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 3 continues to develop the algebra and graphing of functions and extends student understanding of the properties and language of functions by:

- Providing contextual situations where piecewise functions, and systems of equations and inequalities, can be applied.
- Giving students opportunities to work with functions in a variety of ways: graphical, numerical, analytical, verbal.
- Allowing students to communicate mathematics and explain solutions.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Graphing Inequalities and Piecewise-Defined Functions, *Earnings on a Graph*

- Write, solve, and graph linear inequalities
- Use function notation
- Determine a reasonable domain and range
- Define and graph piecewise-defined functions

Embedded Assessment 2

Systems of Equations and Inequalities, *Tilt the Scales*

- Write, solve, and graph systems of linear equations and inequalities

- Interpret the intersection point of two linear equations in a context
- Represent constraints with equations and inequalities

Suggested Pacing

p. 209b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 14	4	
Activity 15	3	
Activity 16	2	
Embedded Assessment 1	1	
Activity 17	5	
Activity 18	2	
Embedded Assessment 2	1	
Total 45-Minute Periods	**19**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the eBook Teacher Resources.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 4 | Exponents, Radicals, and Polynomials

Unit 4: Exponents, Radicals, and Polynomials

In prior units students have generally studied linear relationships. Now students focus on exponent rules and functions, and extends into operations with radical and polynomial functions and operations. Rational expressions are also introduced. p. 285a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 4 expands on students' understanding of the concept of rate of change, as well as the properties, language, and algebra of some nonlinear functions by:

- Giving students the opportunity to look further at exponential and polynomial functions graphically, numerically, algebraically, and verbally, both in and out of contextual situations.
- Introducing geometric sequences and the formulas for calculating their terms.

Unpacking the Embedded Assessments p. 285b

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Exponents, Radicals, and Geometric Sequences *Taking Stock*

- Rational and irrational numbers
- Exponential expressions
- Radical expressions
- Geometric sequences

Embedded Assessment 2

Exponential Functions, *Family Bonds*

- Exponential functions

- Compound interest

Embedded Assessment 3

Polynomial Operations, *Measuring Up*

- Adding polynomials
- Multiplying polynomials

Embedded Assessment 4

Factoring and Simplifying Rational Expressions, *Rock Star Demands*

- Factoring trinomials
- Dividing polynomials
- Rational expressions

Suggested Pacing

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 19	3	
Activity 20	3	
Activity 21	2	
Embedded Assessment 1	1	
Activity 22	3	
Activity 23	2	
Embedded Assessment 2	1	
Activity 24	3	
Activity 25	3	
Embedded Assessment 3	1	
Activity 26	2	
Activity 27	2	
Activity 28	4	

Embedded Assessment 4	1	
Total 45-Minute Periods	**32**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the eBook Teacher Resources.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 5	Quadratic Functions

Unit 5: Quadratic Functions

In this unit, students will use a variety of methods to solve quadratic equations, as well as systems of two equations that contain linear and quadratic or exponential functions. They will apply this to modeling real-world situations. p. 421a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

This unit helps prepare students for Advanced Placement courses by

- Modeling motion using quadratic relationships.
- Making connections between multiple ways to represent mathematical information: numerically, graphically, verbally and algebraically.
- Increasing student ability to solve a wide-variety of equations and to choose the most appropriate solution method when needed.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Graphing Quadratic Functions, *Parabolic Paths*

- Writing quadratic functions
- Analyzing quadratic functions
- Graphing quadratic functions
- Transforming quadratic functions

Embedded Assessment 2

Solving Quadratic Equations, *Egg Drop*

- Writing the equation of a quadratic function to fit data
- Using a quadratic model to solve problems
- Interpreting solutions of a quadratic equation

Embedded Assessment 3

Solving Systems of Equations, *Sports Collector*

- Graphing linear, quadratic, and exponential functions
- Identifying the domain of a function
- Identifying the function with the greatest maximum value
- Solving systems of equations

Suggested Pacing

p. 421b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 29	2	
Activity 30	3	
Embedded Assessment 1	1	
Activity 31	3	
Activity 32	5	
Activity 33	2	
Embedded Assessment 2	1	
Activity 34	3	
Activity 35	2	
Embedded Assessment 3	1	
Total 45-Minute Periods	24	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the eBook Teacher Resources.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 6 | Probability and Statistics

Unit 6: Probability and Statistics

In this unit, students study univariate data, using statistics and graphs to compare different distributions. They use two-way tables to summarize bivariate categorical data. Technology is used to calculate a measure of strength and direction for relationships in bivariate data that are linear in form, and distinguish between correlation/association and causation. p. 521a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

This unit develops students' understanding of statistics by:

- Investigating applications of univariate and bivariate data.
- Communicating mathematical relationships graphically, visually and verbally.
- Using technology to experiment, analyze and interpret results, and support conclusions.
- Developing an understanding of and using the vocabulary of statistics.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Comparing Univariate Distributions, *Splitting the Bill*

- Visual comparison of univariate graphical displays
- Computational comparisons of center and spread
- Determining outliers and creating modified box plots
- Determining appropriate measures of variability

Embedded Assessment 2

- Describing a bivariate numerical relationship and associating that description with a correlation coefficient
- Developing a linear model, interpreting its components, using the model for prediction, and recognizing its limitations
- Analyzing row percentages and segmented bar graphs to investigate association

Suggested Pacing

p. 521b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials

	45-Minute Period	Your Comments on Pacing
Unit Overview/ Getting Ready	1	
Activity 36	3	
Activity 37	4	
Embedded Assessment 1	1	
Activity 38	3	
Activity 39	5	
Activity 40	3	
Embedded Assessment 2	1	
Total 45-Minute Periods	**21**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the eBook Teacher Resources.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 2 | **Quadratic Functions**

Unit 2: Quadratic Functions

In this unit, students write the equations of quadratic functions to model situations and then graph these functions. They study methods of finding solutions to quadratic equations and interpreting these solutions. In the process, students learn about complex numbers. p. 101a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP/College Readiness

Unit 2 continues to prepare students for advanced studies in mathematics by:

- Modeling real-world situations using a quadratic function and interpreting the key features of their graphs in context.
- Learning methods for finding the solutions of quadratic equations.
- Extending their knowledge of number systems to the complex numbers.

Unpacking the Embedded Assessments p. 101b

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Applications of Quadratic Functions and Equations, No Horsing Around

- Quadratic functions
- Quadratic equations
- Discriminants
- Complex numbers

Embedded Assessment 2

Writing and Transforming Quadratic Functions, The Safari Experience

- Standard form of a parabola

- Vertex form of a parabola
- Transformation
- Directrix, focus, and axis of symmetry

Embedded Assessment 3

Graphing Quadratic Functions and Solving Systems, The Green Monster

- Graph of a parabola
- Maximum of a parabola
- Domain and range of quadratic functions
- System of equations with a linear equation and a quadratic equation

Suggested Pacing

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 7	4	
Activity 8	3	
Activity 9	3	
Embedded Assessment 1	1	
Activity 10	3	
Activity 11	3	
Embedded Assessment 2	1	
Activity 12	5	
Activity 13	2	
Embedded Assessment 3	1	
Total 45-Minute Periods	27	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)

Answers
Teacher Copy

Unit 3	Polynomials

Unit 3: Polynomials

In this unit, students begin by writing and graphing a third-degree equation that represents a real-world situation. They perform operations on polynomials; factor polynomials; identify the extrema, zeros, and roots of polynomials; and study the end behavior of graphs of polynomial functions. p. 225a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 3 expands on students' understanding of polynomial functions and their graphs, and introduces students to counting principles and the Binomial Theorem by:

- Modeling a real-world situation using a cubic function.
- Making connections between multiple ways to represent mathematical information: verbally, algebraically, and graphically.
- Increasing student ability to work with a wide variety of functions.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Polynomial Operations, *This Test is Square*

- Polynomial functions
- Operations with polynomials
- Graphs of polynomials
- Binomial expansion
- Binomial Theorem

Embedded Assessment 2

Factoring and Graphing Polynomials, *Sketch Artist*

- Factoring polynomials
- Graphing polynomial functions

Suggested Pacing

p. 225b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 14	3–4	
Activity 15	3–4	
Activity 16	2–3	
Embedded Assessment 1	1	
Activity 17	2–3	
Activity 18	3–4	
Embedded Assessment 2	1	
Total 45-Minute Periods	**16–21**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 4 | Series, Exponential and Logarithmic Functions

Unit 4: Series, Exponential and Logarithmic Functions

In this unit, students study arithmetic and geometric sequences and implicit and explicit rules for defining them. Then they analyze exponential and logarithmic patterns and graphs as well as properties of logarithms. Finally, they solve exponential and logarithmic equations. p. 293a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first embedded assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each embedded assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP/College Readiness

Unit 4 continues to develop students' understanding of functions and their inverses by:

- Graphing exponential and logarithmic functions.
- Applying properties of exponents to develop properties of logarithms.
- Solving exponential and logarithmic equations.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Sequences and Series, *The Chessboard Problem*

- Identifying terms in arithmetic and geometric sequences
- Identifying common differences and common ratios
- Writing implicit and explicit rules for arithmetic and geometric sequences

Embedded Assessment 2

Exponential Functions and Common Logarithms, *Whether or Not*

- Examining exponential patterns and functions
- Identifying and analyzing exponential graphs.

- Transforming exponential functions
- Graphing and transforming natural base exponential functions
- Examining common logarithmic functions
- Understanding properties of logarithms

Embedded Assessment 3

Exponential and Logarithmic Equations, *Evaluating Your Interest*

- Solving exponential equations
- Solving logarithmic equations
- Solving real-world applications of exponential and logarithmic functions

Suggested Pacing

p. 293b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 19	3	
Activity 20	3	
Embedded Assessment 1	1	
Activity 21	5	
Activity 22	4	
Embedded Assessment 2	1	
Activity 23	3	
Activity 24	4	
Embedded Assessment 3	1	
Total 45-Minute Periods	26	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 5 | Radical and Rational Functions

Unit 5: Radical and Rational Functions

In this unit, students study radical and rational functions. They graph these functions and explore transformations. Students find the roots of these functions and learn to identify asymptotes. Students also explore inverse variation, and they solve rational inequalities. p. 385a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss the meaning and use of graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 5 continues to engage students in various types of functions by:

- Graphing square root and cube root functions.
- Finding inverses of square root and cube root functions.
- Graphing rational functions.
- Solving inverse variation problems.
- Simplifying rational expressions.
- Solving rational equations and inequalities.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Radical Functions: Square Roots, Cube Roots, and Their Inverses, *How Big is That Ball?*

- Square root functions
- Cube root functions
- Transformations of square root and cube root functions
- Inverses of square root and cube root functions

Embedded Assessment 2

Rational Functions and Variation, *A Condo for My Cat*

- Rational functions
- Inverse variation

Embedded Assessment 3

Rational Expressions, Equations, and Inequalities, *Work It Out!*

- Rational expressions
- Rational equations
- Rational inequalities

Suggested Pacing

p. 385b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 25	4	
Activity 26	2	
Embedded Assessment 1	1	
Activity 27	3	
Activity 28	2	
Embedded Assessment 2	1	
Activity 29	4	
Activity 30	2	
Embedded Assessment 3	1	
Total 45-Minute Periods	**21**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 5 | Radical and Rational Functions

Unit 5: Radical and Rational Functions

In this unit, students study radical and rational functions. They graph these functions and explore transformations. Students find the roots of these functions and learn to identify asymptotes. Students also explore inverse variation, and they solve rational inequalities. p. 385a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss the meaning and use of graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 5 continues to engage students in various types of functions by:

- Graphing square root and cube root functions.
- Finding inverses of square root and cube root functions.
- Graphing rational functions.
- Solving inverse variation problems.
- Simplifying rational expressions.
- Solving rational equations and inequalities.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Radical Functions: Square Roots, Cube Roots, and Their Inverses, *How Big is That Ball?*

- Square root functions
- Cube root functions
- Transformations of square root and cube root functions
- Inverses of square root and cube root functions

Embedded Assessment 2

Rational Functions and Variation, *A Condo for My Cat*

- Rational functions
- Inverse variation

Embedded Assessment 3

Rational Expressions, Equations, and Inequalities, *Work It Out!*

- Rational expressions
- Rational equations
- Rational inequalities

Suggested Pacing

p. 385b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 25	4	
Activity 26	2	
Embedded Assessment 1	1	
Activity 27	3	
Activity 28	2	
Embedded Assessment 2	1	
Activity 29	4	
Activity 30	2	
Embedded Assessment 3	1	
Total 45-Minute Periods	**21**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 6	Trigonometry

Unit 6: Trigonometry

In this unit, students build on their knowledge of trigonometry from geometry and extend it to radian measure and the unit circle. Students will apply trigonometric functions to understanding real-world periodic phenomena. p. 475a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 6 continues to engage students with various types of functions by:

- Analyzing periodic functions.
- Graphing sine, cosine, and tangent functions.
- Modeling real-world phenomena using sine and cosine functions.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Radians, Unit Circles, and Trigonometry, *A Floral Clock*

- Radian measure
- Unit circle on the coordinate plane
- Special right triangles and the unit circle
- Trigonometric identities

Embedded Assessment 2

Trigonometric Functions, *Totally Tires*

- Sine and cosine functions

- Translating trigonometric functions

- Trigonometric models of periodic phenomena

Suggested Pacing

p. 475b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 31	2	
Activity 32	2	
Activity 33	2	
Embedded Assessment 1	1	
Activity 34	5	
Activity 35	1	
Embedded Assessment 2	1	
Total 45-Minute Periods	15	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 1	Proof, Parallel and Perpendicular Lines

Unit Overview

Ask students to read the unit overview and mark the text to identify key phrases that indicate what they will learn in this unit.

Key Terms **p. 1a**

As students encounter new terms in this unit, help them to choose an appropriate graphic organizer for their word study. As they complete a graphic organizer, have them place it in their math notebooks and revisit as needed as they gain additional knowledge about each word or concept.

Developing Math Language

As this unit progresses, help students make the transition from general words they may already know (the Academic Vocabulary) to the meanings of those words in mathematics. You may want students to work in pairs or small groups to facilitate discussion and to build confidence and fluency as they internalize new language. Ask students to discuss new academic and mathematics terms as they are introduced, identifying meaning as well as pronunciation and common usage. Remind students to use their math notebooks to record their understanding of new terms and concepts.

As needed, pronounce new terms clearly and monitor students' use of words in their discussions to ensure that they are using terms correctly. Encourage students to practice fluency with new words as they gain greater understanding of mathematical and other terms.

Essential Questions

Read the essential questions with students and ask them to share possible answers. As students complete the unit, revisit the essential questions to help them adjust their initial answers as needed.

Unpacking Embedded Assessments

Prior to beginning the first activity in this unit, turn to Embedded Assessment 1 and have students unpack the assessment by identifying the skills and knowledge they will need to complete the assessment successfully. Guide students through a close reading of the assessment, and use a graphic organizer or other means to capture their identification of the skills and knowledge. Repeat the process for each Embedded Assessment in the unit.

Getting Ready

Use some or all of these exercises for formative evaluation of students' readiness for Unit 1 topics.

Prerequisite Skills

- Solving a linear equation (Item 1) 8.EE.C.7b
- Graphing a linear equation (Item 2) HSA-CED.A.2
- Finding slope and writing an equation for the graph of a line (Items 3–5) 8.EE.B.6
- Describing the pattern of a sequence (Item 6) 4.OA.C.5
- Draw a right triangle (Item 7) 4.G.A.2
- Finding the measure of an angle (Item 8) 4.MD.C.6

Getting Ready Practice

For students who may need additional instruction on one or more of the prerequisite skills for this unit, Getting Ready practice pages are available in the Teacher Resources at SpringBoard Digital. These practice pages include worked-out examples as well as multiple opportunities for students to apply concepts learned.

Unit 1: Proof, Parallel and Perpendicular Lines

In this unit, students study formal definitions of basic figures, the axiomatic system of geometry and the basics of logical reasoning. They are then introduced to mathematical proof by applying formal definitions and logical reasoning to develop proofs about basic figures. Finally, students learn how to write equations of parallel and perpendicular lines. p. 1a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.

- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 1 introduces students to the fundamentals of mathematical proofs by:

- Formalizing definitions of basic figures.
- Justifying statements about basic figures.
- Constructing proofs about segment and angle measurement and parallel and perpendicular lines.
- Writing equations of parallel and perpendicular lines.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Geometric Figures and Basic Reasoning, *The Art and Math of Folding Paper*

- Geometric figures
- Logical reasoning
- Axiomatic system of geometry

Embedded Assessment 2

Distance, Midpoint, and Angle Measurement, *A Walk in the Park*

- Segment and angle measurement
- Distance and midpoint formulas

Embedded Assessment 3

Angles, Parallel Lines, and Perpendicular Lines, *Graph of Steel*

- Proofs about line segments and angles
- Parallel and perpendicular lines
- Equations of parallel and perpendicular lines

Suggested Pacing

p. 1b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 2 | Transformations, Triangles, and Quadrilaterals

Unit Overview

Ask students to read the unit overview and mark the text to identify key phrases that indicate what they will learn in this unit.

Key Terms

As students encounter new terms in this unit, help them to choose an appropriate graphic organizer for their word study. As they complete a graphic organizer, have them place it in their math notebooks and revisit as needed as they gain additional knowledge about each word or concept.

Developing Math Language

As this unit progresses, help students make the transition from general words they may already know (the Academic Vocabulary) to the meanings of those words in mathematics. You may want students to work in pairs or small groups to facilitate discussion and to build confidence and fluency as they internalize new language. Ask students to discuss new academic and mathematics terms as they are introduced, identifying meaning as well as pronunciation and common usage. Remind students to use their math notebooks to record their understanding of new terms and concepts.

As needed, pronounce new terms clearly and monitor students' use of words in their discussions to ensure that they are using terms correctly. Encourage students to practice fluency with new words as they gain greater understanding of mathematical and other terms.

Essential Questions

Read the essential questions with students and ask them to share possible answers. As students complete the unit, revisit the essential questions to help them adjust their initial answers as needed.

Unpacking Embedded Assessments

Prior to beginning the first activity in this unit, turn to Embedded Assessment 1 and have students unpack the assessment by identifying the skills and knowledge they will need to complete the assessment successfully. Guide students through a close reading of the assessment, and use a graphic organizer or other means to capture their identification of the skills and knowledge. Repeat the process for each Embedded Assessment in the unit.

Getting Ready

Use some or all of these exercises for formative evaluation of students' readiness for Unit 1 topics.

Prerequisite Skills

- Solving a linear equation (Item 1) 8.EE.C.7b
- Graphing a linear equation (Item 2) HSA-CED.A.2
- Finding slope and writing an equation for the graph of a line (Items 3–5) 8.EE.B.6
- Describing the pattern of a sequence (Item 6) 4.OA.C.5
- Draw a right triangle (Item 7) 4.G.A.2
- Finding the measure of an angle (Item 8) 4.MD.C.6

Getting Ready Practice

For students who may need additional instruction on one or more of the prerequisite skills for this unit, Getting Ready practice pages are available in the Teacher Resources at SpringBoard Digital. These practice pages include worked-out examples as well as multiple opportunities for students to apply concepts learned.

Unit 2: Transformations, Triangles, and Quadrilaterals

In this unit, students explore transformations of figures in the coordinate plane. They relate the transformations to congruence, and study the properties of triangles and special quadrilaterals. p. 101a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students use graphic organizers to record their understanding of new words.

- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 2 continues to prepare students for Advanced Placement courses by:

- Modeling real-world situations using reflections, rotations, and translations
- Increasing student ability to write proofs

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Transformations, *Designing the Plaza*

- Compositions of transformations
- Congruent triangles

Embedded Assessment 2

Congruence, Triangles, and Proofs, *Building a Fitness Center*

- Writing proofs
- Making conjectures

Embedded Assessment 3

Properties of Triangles, *Where Does the Fountain Go?*

- Properties of triangles
- Point of concurrency

Embedded Assessment 4

Quadrilaterals, *Lucy Latimer's Logo*

- Properties of special quadrilaterals
- Identifying special quadrilaterals

Suggested Pacing

p. 101b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing

Unit Overview/Getting Ready	1	
Activity 9	4	
Activity 10	2	
Embedded Assessment 1	1	
Activity 11	4	
Activity 12	2	
Embedded Assessment 2	1	
Activity 13	2	
Activity 14	3	
Embedded Assessment 3	1	
Activity 15	4	
Activity 16	4	
Embedded Assessment 4	1	
Total 45-Minute Periods	30	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 3 | Similarity and Trigonometry

Unit Overview

Ask students to read the unit overview and mark the text to identify key phrases that indicate what they will learn in this unit.

Key Terms

As students encounter new terms in this unit, help them to choose an appropriate graphic organizer for their word study. As they complete a graphic organizer, have them place it in their math notebooks and revisit as needed as they gain additional knowledge about each word or concept.

Developing Math Language

As this unit progresses, help students make the transition from general words they may already know (the Academic Vocabulary) to the meanings of those words in mathematics. You may want students to work in pairs or small groups to facilitate discussion and to build confidence and fluency as they internalize new language. Ask students to discuss new academic and mathematics terms as they are introduced, identifying meaning as well as pronunciation and common usage. Remind students to use their math notebooks to record their understanding of new terms and concepts.

As needed, pronounce new terms clearly and monitor students' use of words in their discussions to ensure that they are using terms correctly. Encourage students to practice fluency with new words as they gain greater understanding of mathematical and other terms.

Essential Questions

Read the essential questions with students and ask them to share possible answers. As students complete the unit, revisit the essential questions to help them adjust their initial answers as needed.

Unpacking Embedded Assessments

Prior to beginning the first activity in this unit, turn to Embedded Assessment 1 and have students unpack the assessment by identifying the skills and knowledge they will need to complete the assessment successfully. Guide students through a close reading of the assessment, and use a graphic organizer or other means to capture their identification of the skills and knowledge. Repeat the process for each Embedded Assessment in the unit.

Getting Ready

Use some or all of these exercises for formative evaluation of students' readiness for Unit 1 topics.

Prerequisite Skills

- Solving a linear equation (Item 1) 8.EE.C.7b
- Graphing a linear equation (Item 2) HSA-CED.A.2
- Finding slope and writing an equation for the graph of a line (Items 3–5) 8.EE.B.6
- Describing the pattern of a sequence (Item 6) 4.OA.C.5
- Draw a right triangle (Item 7) 4.G.A.2
- Finding the measure of an angle (Item 8) 4.MD.C.6

Getting Ready Practice

For students who may need additional instruction on one or more of the prerequisite skills for this unit, Getting Ready practice pages are available in the Teacher Resources at SpringBoard Digital. These practice pages include worked-out examples as well as multiple opportunities for students to apply concepts learned.

Unit 3: Similarity and Trigonometry

In prior units, students have learned the characteristics of various types of triangles and quadrilaterals, including right triangles and rectangles. Students have also learned ways to prove triangles and other polygons congruent. This unit uses student knowledge of congruent figures to develop similarity rules for triangles and other polygons. In addition, students will expand their knowledge of right triangles through the use of the Pythagorean Theorem, special right triangles, and trigonometric ratios. p. 239a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of the word to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 3 continues to develop students' understanding of the characteristics of plane figures by:

- Allowing students to communicate mathematics and explain solutions verbally and in written form.
- Using technology to help solve problems and support conclusions.
- Encouraging students to determine the reasonableness of solutions including size and relative accuracy.
- Providing contextual situations where special right triangles and trigonometric functions can be applied.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Similarity in Polygons, *Monitoring Progress*

- Properties of similar figures
- Similarity transformations

Embedded Assessment 2

Right Triangles, *Powered by the Wind*

- Altitudes of right triangles and geometric means
- Proving and applying the Pythagorean Theorem
- Relationships in special right triangles

Embedded Assessment 3

Trigonometry, *Zipping Along*

- Trigonometric functions
- Law of Sines
- Law of Cosines
- Solving triangles

Suggested Pacing

p. 239b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 17	3	
Activity 18	3	
Embedded Assessment 1	1	
Activity 19	2	
Activity 20	2	
Activity 21	2	
Embedded Assessment 2	1	
Activity 22	4	
Activity 23	4	
Embedded Assessment 3	1	
Total 45-Minute Periods	24	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 4	Circles, Coordinates, and Constructions

Unit Overview

Ask students to read the unit overview and mark the text to identify key phrases that indicate what they will learn in this unit.

Key Terms

As students encounter new terms in this unit, help them to choose an appropriate graphic organizer for their word study. As they complete a graphic organizer, have them place it in their math notebooks and revisit as needed as they gain additional knowledge about each word or concept.

Developing Math Language

As this unit progresses, help students make the transition from general words they may already know (the Academic Vocabulary) to the meanings of those words in mathematics. You may want students to work in pairs or small groups to facilitate discussion and to build confidence and fluency as they internalize new language. Ask students to discuss new academic and mathematics terms as they are introduced, identifying meaning as well as pronunciation and common usage. Remind students to use their math notebooks to record their understanding of new terms and concepts.

As needed, pronounce new terms clearly and monitor students' use of words in their discussions to ensure that they are using terms correctly. Encourage students to practice fluency with new words as they gain greater understanding of mathematical and other terms.

Essential Questions

Read the essential questions with students and ask them to share possible answers. As students complete the unit, revisit the essential questions to help them adjust their initial answers as needed.

Unpacking Embedded Assessments

Prior to beginning the first activity in this unit, turn to Embedded Assessment 1 and have students unpack the assessment by identifying the skills and knowledge they will need to complete the assessment successfully. Guide students through a close reading of the assessment, and use a graphic organizer or other means to capture their identification of the skills and knowledge. Repeat the process for each Embedded Assessment in the unit.

Getting Ready

Use some or all of these exercises for formative evaluation of students' readiness for Unit 1 topics.

Prerequisite Skills

- Solving a linear equation (Item 1) 8.EE.C.7b
- Graphing a linear equation (Item 2) HSA-CED.A.2
- Finding slope and writing an equation for the graph of a line (Items 3–5) 8.EE.B.6
- Describing the pattern of a sequence (Item 6) 4.OA.C.5
- Draw a right triangle (Item 7) 4.G.A.2
- Finding the measure of an angle (Item 8) 4.MD.C.6

Getting Ready Practice

For students who may need additional instruction on one or more of the prerequisite skills for this unit, Getting Ready practice pages are available in the Teacher Resources at SpringBoard Digital. These practice pages include worked-out examples as well as multiple opportunities for students to apply concepts learned.

Unit 4: Circles, Coordinates, and Constructions

In this unit, students study angles in a circle and lengths of chords and tangents. They are introduced to coordinate proofs and write equations of circles and parabolas. Then they apply what they have learned about circles to basic straightedge-and-compass constructions. p. 333a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.

- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first embedded assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each embedded assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 4 continues to develop students' skill in constructing proofs and in their use of basic tools of geometry by:

- Investigating relationships among angle and arc measures in circles as well as lengths of chords and tangents.
- Developing coordinate proofs.
- Using a compass and straightedge for basic constructions which are applied both in contextual and noncontextual problems.
- Writing equations of circles and parabolas that meet given criteria.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Circles, *Vertigo Round*

- Central angles, inscribed angles, and intercepted arcs
- Angles formed by two chords, tangents, and secants
- Lengths of chord, tangent, and secant segments

Embedded Assessment 2

Coordinates and Constructions, *Location Matters*

- Coordinate proofs
- Writing equations of circles
- Finding the center and radius of a circle from its equation
- Writing equations of parabolas
- Geometric constructions

Suggested Pacing

p. 333b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	

Activity 24	3	
Activity 25	4	
Embedded Assessment 1	1	
Activity 26	4	
Activity 27	2	
Activity 28	2	
Activity 29	3	
Embedded Assessment 2	1	
Total 45-Minute Periods	21	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 5 Extending Two Dimensions to Three Dimensions

Unit Overview

Ask students to read the unit overview and mark the text to identify key phrases that indicate what they will learn in this unit.

Key Terms

As students encounter new terms in this unit, help them to choose an appropriate graphic organizer for their word study. As they complete a graphic organizer, have them place it in their math notebooks and revisit as needed as they gain additional knowledge about each word or concept. p. 431a

Developing Math Language

As this unit progresses, help students make the transition from general words they may already know (the Academic Vocabulary) to the meanings of those words in mathematics. You may want students to work in pairs or small groups to facilitate discussion and to build confidence and fluency as they internalize new language. Ask students to discuss new academic and mathematics terms as they are introduced, identifying meaning as well as pronunciation and common usage. Remind students to use their math notebooks to record their understanding of new terms and concepts.

As needed, pronounce new terms clearly and monitor students' use of words in their discussions to ensure that they are using terms correctly. Encourage students to practice fluency with new words as they gain greater understanding of mathematical and other terms.

Essential Questions

Read the essential questions with students and ask them to share possible answers. As students complete the unit, revisit the essential questions to help them adjust their initial answers as needed.

Unpacking Embedded Assessments

Prior to beginning the first activity in this unit, turn to Embedded Assessment 1 and have students unpack the assessment by identifying the skills and knowledge they will need to complete the assessment successfully. Guide students through a close reading of the assessment, and use a graphic organizer or other means to capture their identification of the skills and knowledge. Repeat the process for each Embedded Assessment in the unit.

Getting Ready

Use some or all of these exercises for formative evaluation of students' readiness for Unit 1 topics.

Prerequisite Skills

- Solving a linear equation (Item 1) 8.EE.C.7b
- Graphing a linear equation (Item 2) HSA-CED.A.2
- Finding slope and writing an equation for the graph of a line (Items 3–5) 8.EE.B.6
- Describing the pattern of a sequence (Item 6) 4.OA.C.5
- Draw a right triangle (Item 7) 4.G.A.2
- Finding the measure of an angle (Item 8) 4.MD.C.6

Getting Ready Practice

For students who may need additional instruction on one or more of the prerequisite skills for this unit, Getting Ready practice pages are available in the Teacher Resources at SpringBoard Digital. These practice pages include worked-out examples as well as multiple opportunities for students to apply concepts learned.

Unit 5: Extending Two Dimensions to Three Dimensions

In this unit, students study various properties of two-dimensional and three-dimensional figures. Students develop various formulas for perimeter and area. They develop surface area and volume formulas for prisms, cylinders, pyramids, cones, and spheres. Students also explore the effects of changing dimensions and investigate spherical geometry. p. 431a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.

- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 5 extends students' understanding of the properties of plane figures and solids by:

- Applying area and volume formulas in contextual situations.
- Developing the area formula for a circle as necessary for determining volumes of rotational solids required in AP Calculus.
- Developing area formulas necessary for approximating the area beneath a curve and determining volumes of solids with known cross sections.
- Providing contextual situations where calculating the area or volume of a composite shape is a necessary step to determining a solution.

Unpacking the Embedded Assessments

p. 431b

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Area and Perimeter, *Play Planning*

- Finding perimeters and areas of composite figures
- Finding perimeters and areas of regular polygons
- Converting between radian and degree measures
- Showing that all circles are similar

Embedded Assessment 2

Surface Area and Volume, *Action-Packed Measurements*

- Surface areas of prisms, cylinders, and cones
- Volumes of prisms, cylinders, and cones
- Solve design problems using applications of geometric concepts, including density based on area and volume

Embedded Assessment 3

Changing Dimensions of Spheres, *Spherical Storage*

- Surface areas of spheres
- Volumes of spheres
- Applications of geometric concepts, including changing dimensions of 3-D figures, to solve problems

Suggested Pacing

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 30	3	
Activity 31	3	
Activity 32	3	
Embedded Assessment 1	1	
Activity 33	3	
Activity 34	2	
Activity 35	3	
Embedded Assessment 2	1	
Activity 36	3	
Activity 37	2	
Embedded Assessment 3	1	
Total 45-Minute Periods	26	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 6 | Probability

Unit Overview

Ask students to read the unit overview and mark the text to identify key phrases that indicate what they will learn in this unit.

Key Terms

As students encounter new terms in this unit, help them to choose an appropriate graphic organizer for their word study. As they complete a graphic organizer, have them place it in their math notebooks and revisit as needed as they gain additional knowledge about each word or concept.

Developing Math Language

As this unit progresses, help students make the transition from general words they may already know (the Academic Vocabulary) to the meanings of those words in mathematics. You may want students to work in pairs or small groups to facilitate discussion and to build confidence and fluency as they internalize new language. Ask students to discuss new academic and mathematics terms as they are introduced, identifying meaning as well as pronunciation and common usage. Remind students to use their math notebooks to record their understanding of new terms and concepts.

As needed, pronounce new terms clearly and monitor students' use of words in their discussions to ensure that they are using terms correctly. Encourage students to practice fluency with new words as they gain greater understanding of mathematical and other terms.

Essential Questions

Read the essential questions with students and ask them to share possible answers. As students complete the unit, revisit the essential questions to help them adjust their initial answers as needed.

Unpacking Embedded Assessments

Prior to beginning the first activity in this unit, turn to Embedded Assessment 1 and have students unpack the assessment by identifying the skills and knowledge they will need to complete the assessment successfully. Guide students through a close reading of the assessment, and use a graphic organizer or other means to capture their identification of the skills and knowledge. Repeat the process for each Embedded Assessment in the unit.

Getting Ready

Use some or all of these exercises for formative evaluation of students' readiness for Unit 1 topics.

Prerequisite Skills

- Solving a linear equation (Item 1) 8.EE.C.7b
- Graphing a linear equation (Item 2) HSA-CED.A.2
- Finding slope and writing an equation for the graph of a line (Items 3–5) 8.EE.B.6
- Describing the pattern of a sequence (Item 6) 4.OA.C.5
- Draw a right triangle (Item 7) 4.G.A.2
- Finding the measure of an angle (Item 8) 4.MD.C.6

Getting Ready Practice

For students who may need additional instruction on one or more of the prerequisite skills for this unit, Getting Ready practice pages are available in the Teacher Resources at SpringBoard Digital. These practice pages include worked-out examples as well as multiple opportunities for students to apply concepts learned.

Unit 6: Probability

In prior units students have generally studied the properties of figures. In this unit, students focus on applications of probability. They use Venn and tree diagrams to model situations involving probability to analyze probable results. p. 551a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help student learn new vocabulary:

- Have students use graphic organizers to record their understanding of new words.

- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP/College Readiness

Unit 6 expands on students' understanding of the concept of probability, as well as the use of Venn and tree diagrams to model real-world situations by:

- Giving students the opportunity to investigate sample spaces in and out of contextual situations.
- Introducing the Addition and Multiplication rules for calculating probability.

Unpacking the Embedded Assessment

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Finding Probabilities Using the Addition Rule *Diane's Books*

- Samples Spaces
- Venn Diagram and Probability Notation
- The Addition Rule and Mutually Exclusive Events

Embedded Assessment 2

Conditional Probability and Independent Events *Diane's e-Books*

- Independent Events
- Conditional probability
- Multiplication Rule
- Geometric probability
- Permutations and combinations

Suggested Pacing

p. 551b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experience in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 38	4–5	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 7 | Probability and Statistics

Unit 7: Probability and Statistics

In this unit, students study normal data distributions and solve problems using tables and technology. An examination of bias provides students with a reason to develop simple random samples from a population of interest. Students create simulations with and without technology to test conjectures about data. Margin of error is applied to population proportions and an informal understanding of statistical significance is developed. p. 551a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 7 continues to develop student understanding of statistical methods by:

- Exploring properties of normal distributions.
- Applying random sampling to experiments and observational studies.
- Using simulations to support or refute conjectures.
- Establishing margin of error with population proportions.
- Developing the concept of statistical significance.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Normal Models, Surveys, and Experiments, *Researching Readers*

- Properties of normal distributions
- Sampling techniques in studies
- Characteristics of experimental studies
- Characteristics of observational studies

Embedded Assessment 2

Simulations, Margin of Error, and Hypothesis Testing, *Psychic or Just Hot Air?*

- Simulation of random processes
- Testing the truth of a conjecture
- Statistical significance
- Margin of error

Suggested Pacing

p. 551b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 36	3–4	
Activity 37	3–4	
Embedded Assessment 1	1	
Activity 38	2–3	
Activity 39	2–3	
Activity 40	2–3	
Embedded Assessment 2	1	
Total 45-Minute Periods	15–20	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 1 | Sequences, Series, Exponential and Logarithmic Functions

Unit 1: Sequences, Series, Exponential and Logarithmic Functions

In this unit, students study arithmetic and geometric sequences. Then they explore exponential and logarithmic functions. Those, along with power functions, are used to model real-world scenarios. Finally, students look at function composition and inverses of functions. p. 1a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 1 continues to engage students in various uses of functions by:

- Writing functions to represent sequences.
- Graphing and evaluating exponential and logarithmic functions.
- Modeling data with functions.
- Operating with functions.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Sequences, *The Old Square Craft*

- Arithmetic sequences
- Geometric sequences
- Sums of sequences

Embedded Assessment 2

Exponential and Logarithmic Functions, *Population Explosion*

- Exponential functions
- Exponential equations

- Logarithmic equations

Embedded Assessment 3

Mathematical Transformations, Compositions, and Inverses, *Feeding Frenzy*

- Transformations
- Power functions
- Composition of functions
- Inverses of functions

Suggested Pacing

p. 1b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute period	Your comments on Pacing
Unit Overview/Getting Ready	1	
Activity 1	4	
Activity 2	3	
Activity 3	2	
Embedded Assessment 1	1	
Activity 4	3	
Activity 5	3	
Embedded Assessment 2	1	
Activity 6	2	
Activity 7	2	
Activity 8	2	
Embedded Assessment 3	1	
Total 45-Minute Periods	25	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 2 | Functions and Their Graphs

Unit 2: Functions and Their Graphs

In this unit, students study polynomial and rational functions. They graphs these functions and find zeros. They explore complex factors of polynomial functions. Students also solve polynomial inequalities. p. 117a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary: **p. 117a**

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 2 continues to engage students in various types of functions by:

- Graphing polynomial functions.
- Finding zeros of polynomial functions.
- Solving polynomial inequalities.
- Graphing rational functions.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Polynomial Functions, *Coffee Time*

- Polynomial functions
- Complex polynomial roots
- Zeros of polynomial functions
- Polynomial inequalities

Embedded Assessment 2

Rational Functions, *Taneytown Reunion*

- Rational functions

- Graphing rational functions
- Asymptotes

Suggested Pacing

p. 117b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 9	2	
Activity 10	3	
Activity 11	3	
Embedded Assessment 1	1	
Activity 12	2	
Activity 13	3	
Embedded Assessment 2	1	
Total 45-Minute Periods	15	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 3 | Trigonometric Functions

Unit 3: Trigonometric Functions

In this unit, students study trigonometric functions. They graph these functions and analyze their behaviors. They explore inverse trigonometric functions. Students also solve trigonometric equations. p. 185a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 3 continues to engage students in various types of functions by:

- Graphing trigonometric functions.
- Analyzing end behaviors of trigonometric functions.
- Solving trigonometric equations.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Angles, the Unit Circle, and Trigonometric Graphs, Orbiting Spacecraft

- Reference angles
- Trigonometric functions

Embedded Assessment 2

Inverse Trigonometric Functions and Trigonometric Equations, How Deep is the River?

- Inverse trigonometric functions
- Trigonometric equations

Suggested Pacing p. 185b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing

guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 14	2–3	
Activity 15	3–4	
Activity 16	2–3	
Activity 17	2–3	
Activity 18	2–3	
Embedded Assessment 1	1	
Activity 19	3–4	
Activity 20	2–3	
Embedded Assessment 2	1	
Total 45-Minute Periods	**19–26**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 4	Analytic Trigonometry and Trigonometric Applications

Unit 4: Analytic Trigonometry and Trigonometric Applications

In this unit, students study trigonometric functions. They graph these functions and analyze their behaviors. They explore inverse trigonometric functions. Students also solve trigonometric equations. p. 277a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 4 continues to engage students in various types of functions by:

- Solving trigonometric equations.
- Using trigonometric identities.
- Using the Law of Cosines and Law of Sines.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Trigonometric Identities and Equations, *A Quick-Start Guide for Trig*

- Trigonometric identities
- Trigonometric equations

Embedded Assessment 2

Right and Oblique Triangles, Area, *Tilting Towers and Triangles*

- Law of Cosines
- Law of Sines

Suggested Pacing p. 277b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing

guidelines based on your experiences in using the materials.

	45-Minute period	Your comments on Pacing
Unit Overview/Getting Ready	1	
Activity 21	2	
Activity 22	2–3	
Activity 23	3–5	
Embedded Assessment 1	**1**	
Activity 24	2–3	
Activity 25	2	
Embedded Assessment 2	1	
Total 45-Minute Periods	**14–18**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 5 | Conics, Parametric Equations, and Vectors

Unit 5: Conics, Parametric Equations, and Vectors

In this unit, students study conic sections, parametric equations, and vectors. They write equations for and graph conic sections. Students also write and graph parametric equations. Finally, they use vectors to model motion and operate with vectors. p. 345a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have students discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first embedded assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each embedded assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 5 continues to develop the concept of graphs and extends students' understanding of the properties and language of conic sections, motion and parametrics, and polar graphs by:

- Writing equations for conic sections.
- Graphing parametric equations.
- Using vectors to solve problems.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Conic Sections and Polar Graphs, Make a Beeline (or a Bee Curve)

- Polar graphs
- Conic sections

Embedded Assessment 2

Parametric Equations, A Pirate's Life

- Graphing parametric equations
- Converting with parametric equations
- Modeling and solving parametric equations

Embedded Assessment 3

Complex Numbers and Vectors, Electrifying

- Complex numbers
- Vectors

Suggested Pacing

p. 345b

The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute period	Your comments on Pacing
Unit Overview/Getting Ready	1	
Activity 26	2	
Activity 27	3–5	
Activity 28	3	
Activity 29	2–3	
Embedded Assessment 1	1	
Activity 30	3	
Activity 31	3	
Embedded Assessment 2	1	
Activity 32	5–6	
Activity 33	2–3	
Embedded Assessment 3	1	
Total 45-Minute Periods	**27–32**	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)

Answers
Teacher Copy

Unit 6 | Matrices, Systems of Equations, and Volume

Unit 6: Matrices, Systems of Equations, and Volume

In this unit, students represent data with matrices and operate with matrices. They solve problems associated with transformations using matrices and solve systems of equations with matrices. The students investigate volume problems. p. 483a

Vocabulary Development

The key terms for this unit can be found on the Unit Opener page. These terms are divided into Academic Vocabulary and Math Terms. Academic Vocabulary includes terms that have additional meaning outside of math. These terms are listed separately to help students transition from their current understanding of a term to its meaning as a mathematics term. To help students learn new vocabulary:

- Have student discuss meaning and use graphic organizers to record their understanding of new words.
- Remind students to place their graphic organizers in their math notebooks and revisit their notes as their understanding of vocabulary grows.
- As needed, pronounce new words and place pronunciation guides and definitions on the class Word Wall.

Embedded Assessments

Embedded Assessments allow students to do the following:

- Demonstrate their understanding of new concepts.
- Integrate previous and new knowledge by solving real-world problems presented in new settings.

They also provide formative information to help you adjust instruction to meet your students' learning needs.

Prior to beginning instruction, have students unpack the first Embedded Assessment in the unit to identify the skills and knowledge necessary for successful completion of that assessment. Help students create a visual display of the unpacked assessment and post it in your class. As students learn new knowledge and skills, remind them that they will be expected to apply that knowledge to the assessment. After students complete each Embedded Assessment, turn to the next one in the unit and repeat the process of unpacking that assessment with students.

CollegeBoard

AP / College Readiness

Unit 6 continues to engage students in the study of advanced mathematics by:

- Representing data with matrices.
- Operating with matrices.
- Performing transformations with matrices.
- Solving systems of equations with matrices.
- Finding volumes of three-dimensional figures.

Unpacking the Embedded Assessments

The following are the key skills and knowledge students will need to know for each assessment.

Embedded Assessment 1

Matrices, *A Tale of Two Orchards*

- Matrix operations
- Transformations with matrices

Embedded Assessment 2

Matrices and Systems, *Let it Snow, Man!*

- Matrices and systems of equations
- Volume of spheres

Suggested Pacing

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The following table provides suggestions for pacing using a 45-minute class period. Space is left for you to write your own pacing guidelines based on your experiences in using the materials.

	45-Minute Period	Your Comments on Pacing
Unit Overview/Getting Ready	1	
Activity 34	3	
Activity 35	3–4	
Embedded Assessment 1	1	
Activity 36	3	
Activity 37	3	
Embedded Assessment 2	1	
Total 45-Minute Periods	15–16	

Additional Resources

Additional resources that you may find helpful for your instruction include the following, which may be found in the Teacher Resources at SpringBoard Digital.

- Unit Practice (additional problems for each activity)
- Getting Ready Practice (additional lessons and practice problems for the prerequisite skills)
- Mini-Lessons (instructional support for concepts related to lesson content)