Grade 7 Social Studies & Science
Remote Learning Days 21 - 30

Grade 7 Social Studies Remote Learning	
Day	**Activities**
Day 21: April 23rd Social Studies	• Welcome to Day 21 of our remote learning. This packet contains activities for both Social Studies and Science. These will be done much like our A/B day schedule. Read through carefully and do your best. **Renaissance** - Review the study guide in the packet, taking note of bolded words. Some of these words will appear on your vocabulary sheet. Vocabulary exercise, students are allowed to use the internet to get meanings or use their notebooks. Write a two (2) paragraph story using six of the vocabulary words.
Day 23: April 27th Social Studies	• Take a deep breath- studies have shown that taking deep breaths help to reduce stress, relaxes your body and calms your mind. So before you start working, stop, close your eyes, slowly breathe in and out for a few minutes or whatever feels comfortable to you. **Intro to the Renaissance**- Students will complete the reading passage An Introduction to the Renaissance and answer six (6) questions. Using main points from the passage in one paragraph write a summary of the events leading up to the Renaissance. Choose two activities from the choice board to get completed by Friday.
Day 25: April 29th Social Studies	• Goal setting- Write down 5 things that you want to accomplish while you're at home and take a moment out of your day to get it done. **Renaissance Artist**- Read the passage on Renaissance art then answer the questions that follow. Research the different artists and their works to complete the artist table. Clues about their work are given to help you figure it out.
Day 27: May 1st Social Studies	• A kind deed- Do something good for someone today. Share a snack, make a meal, clean up the house, ask if help is needed. Sometimes we are so caught in our own selves that we don't take notice of the people around us. **Medici Family**- Read the passage on the Medici Family the answer the following questions. Research the autobiographies of the Medici family.

Grade 7 Science Remote Learning

7.P.1 Understand motion, the effects of forces on motion and the graphical representations of motion.

Day 22	Force and Motion A to Z Book Use this as a reference text as you complete this unit.
Day 24	Force and Motion Scavenger Hunt. Use the A to Z book to help you complete the assignments.
Day 26	Read "It's Dynamic! Laws of Motion of Speed" Article. Answer the Questions on the Laws of Motion Article Handout.
Day 28	Practice Speed, Time and Distance Formulas using the attached handouts.
Day 30	Test Review. Force and Motion SchoolNet Practice Test Items. Use the key to check your answers.

Renaissance Study Guide

7.40 Explain how the location of the Italian Peninsula impacted the movement of resources, knowledge, and culture throughout Italy's independent trade cities.

- ❒ **I can locate the Italian Peninsula.**
- ❒ I can list the major trade cities of the Italian Peninsula (Florence, Venice, Milan, Genoa, Rome)
- ❒ I can explain how the location of the Italian Peninsula impacted trade.
- ❒ **I can explain how the location of the Italian Peninsula was key to the diffusion of resources, knowledge, and culture.**

- The **Renaissance** was a **rebirth** of the classics (ancient Greek and Roman thinking and styles)
- Reason for **Italy** as the birthplace of the Renaissance was the concentration of wealth, power, and intellect in the Church.
- Italy was the center of trade in the Mediterranean Sea. It was positioned in the middle of many important trading routes between Asia and the rest of Western Europe
- located in the middle of trade routes allowed for more people to interact and Renaisto spread knowledge

Renaissance = "re-birth"

7.41 Identify the importance of Florence, Italy and the Medici Family in the early stages of the Renaissance

- ❒ I can explain the importance of Florence, Italy in the early stages of the Renaissance.
- ❒ I can explain how the wealthy banking family, the Medici's, and their patronage of the arts were essential to the beginnings of the Renaissance.
  - **Florence** is often named as the birthplace of the **Renaissance**. The early writers and artists of the period came from this city in Italy.
  - As a center for the European wool trade, the political power of the city rested primarily in the hands of the wealthy merchants, the Medici Family who were able to support these artists and writers.

Medici Family

- Giovanni de Medici started the Medici Bank and was the leader of the Florence merchants.
- Wool trading and banking made the Medici Family gain prominence in Florence, Italy.
- The Medici Family controlled Florence, Italy.
- The patronage of the Medici Family allowed artists to focus on their work without having to worry about money – artists could focus on creating art.
- Because of their wealth they were able to become patrons of the arts.

Patron = a person who gives financial or other support to a person, organization, cause, or activity

The Medici Family

- Florence's richest family (bankers) circa 1400s.
  - 1435 Cosimo de' Medici ruled the city.
  - Patron of the arts. He commissioned or paid many artists including: Donatello, Botticello, da Vinci, Michelangelo, and more...
  - Built libraries to improve education.
- Closely tied to the Church → God's bank
- Other family members become church officials, popes, queens, dukes and political leaders.

Would the Renaissance have happened without the Medici Family?

7.42 Explain humanism, and describe how Thomas Aquinas's writings influenced humanistic thought and fostered a balance between reason and faith.

- I can define humanism
- I can explain how Thomas Aquinas's writings fostered a balance between reason and faith
- I can explain how humanism led to a renewed interest in the arts and a balance between intellect and religious faith (faith and reason).

Humanism

- Focus on the importance of the individual and other living things.
- Look to Reason to make sense of the world
- Question EVERYTHING

Medieval Catholic Church

- Question nothing
- Look to FAITH alone to make sense of the world.

Thomas Aquinas – Catholic Priest

- Believed that Reason and Faith could coexist
- Believed that humans are capable of doing good.
- Helped combine philosophical ideas (Reason) with those of the church proving that philosophy (Reason) and theology (Faith) do not have to be in conflict with each other.
- Faith builds on reason. Since faith and reason are both ways of arriving at truth -- and since all truths are harmonious with each other -- faith is consistent with reason

7.43 Explain the development of Renaissance art, including the significance of:

Leonardo da Vinci
Michelangelo
William Shakespeare

Systems of patronage

There were two main **systems of artistic patronage** in Renaissance Italy.

1. A patron could take an artist into his household and in return the artist would supply the patron's artistic needs.
2. Or a patron could commission a single work from an artist and employ him until that work was finished.

Leonardo da Vinci

Leonardo da Vinci was famous for his designs, art, cartography, geology, and studies. **Leonardo's** designs later helped us to invent things like the tank, parachute, helicopter and many other things. His natural genius crossed so many disciplines that he epitomized the term "**Renaissance** man." Today he remains best known for his art, including two paintings that remain among the world's most famous and admired, **Mona Lisa and The Last Supper.**

Michelangelo

Michelangelo was a brilliant man of many talents. He worked on the Medici Chapel, the Laurentian Library, and St. Peter's Basilica in Rome. He was commissioned by the Pope in 1508 to paint the ceiling of the **Sistine Chapel**. Michelangelo considered himself to be a sculptor, but agreed to paint the Sistine Chapel for the Pope. He worked for four years, painting upside down on a scaffold in order to finish the painting.

Shakespeare

Shakespeare embraced the **Renaissance** in the following ways:
Shakespeare updated the simplistic, two-dimensional writing style of pre-**Renaissance** drama. He focused on creating human characters with psychological complexity.
... **Shakespeare** utilized his knowledge of Greek and Roman classics when writing his plays

Renaissance Art – individualism, showed individual people instead of groups, secularism – fewer church paintings, nature – outdoors, realism, showed depth, focused on defined and precise human features, realistic, colors brighter and the use of light.

Renaissance & Reformation Vocabulary

Define the following vocabulary words that will be used throughout the unit. You can use a dictionary **(or your brain!)**

- Patrons
  _____
- _____
- Secular
- _____
- _____
- Humanism
- _____
- _____
- Medici
- _____
- _____
- Black Death
- _____
- _____
- linear perspective
- _____
- _____
- realism
- _____
- _____
- Perspective
- _____

- _____
- Northern Renaissance
- _____
- _____
- Italian Renaissance
- _____
- _____
- vernacular
- _____
- _____

Using your Vocabulary! Use the Unit vocabulary to write a story (2 paragraphs). You MUST use 6 of the vocabulary words in the correct context. You may use the words more than once, but you have to use 6 different vocabulary words. Underline or highlight the words in your story.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Introduction to the Renaissance

The time-period when ideas were 'rebirthed' is known as the Renaissance. It came after the middle ages which started with the fall of the Roman Empire. The **Middle Ages** (476 AD - 1400 AD) had wiped out much of the progress that the Roman and Greeks had made in the areas of science, art, and government. This is one of the reasons it has come to be known as the **Dark Ages**. The Renaissance helped pull the world out of the dark, and was sparked by one of the darkest times, the **Black Plague**.

The renaissance is thought to have started between 1350 and 1400. The starting city is considered to be Florence, Italy. **Humanism**, which is the idea that humanity should work together to progress as a species, was a constantly pushed idea. The Italians started to read the teachings that they could find on Rome and Greece, and realized there was once a golden age of civilization in Europe that had been pushed out by the Dark Ages. The Black Plague is often credited with pushing the renaissance forward, because it made the 'thinkers' of the time think more about their own lives and less on spiritual or after life matters.

Italy was broken up into several powerful **city-states**, or single cities that make up a state at the beginning of the Renaissance. Florence was one of the major city-states, and was ran as a **republic** like ancient Rome or Athens. A republic was when citizens elected someone to represent them in a chamber. As Florence became wealthier, merchants as well as businessmen hired artists and craftspeople more and more. This led to the ride of artists as well as philosophers of their time, and art went through its very own 'renaissance'. One of the most prominent families to rise in Florence was the **Medici** family, sometime in the 1400s. They used their wealth to sponsor many aspiring artists as well as help fund the humanist movement.

There were many people to rise in Florence that influenced the movement. The 'Father of Humanism' is often referred to as **Francesco Petrarch**, who was a scholar as well as a poet in the 1300s. He studied Ancient Roman philosophers and poets like **Cicero** and **Virgil**, and his ideas inspire d many writers throughout Europe during the Renaissance. The painter who is thought to have started the style that pushed forward through the renaissance was **Giotto di Bondone**. He painted people as he truly saw them, rather than the abstract methods brought on by the Byzantine Empire during the Middle Ages. The paint style that he invented is known as **realistic painting**.

These ideas spread quickly to many different city-states in Italy, such as Rome, Venice, and Milan. This time-period is often known as the **Italian Renaissance**, as it was Italy leading the charge into this new age of reason. As Italy's wealth grew, so too did their ideas spread across all of Europe. Some of the most famous people of all time got their start here, and the term **renaissance man** was born, which meant a man that could do anything he set his mind to.

Leonardo da Vinci is the man most people think of when they think of the Renaissance. He was a master painter, sculptor, scientist, engineer, architect, inventor, and writer. His ideas pushed people to achieve great things, giving inspiration to humanity about flight, the desire to learn the inner workings of the body, and created beautiful works of art, like the most famous painting in the world, **The Mona Lisa**.

The Renaissance went on to continually push forward new ideas throughout Europe. Christopher Columbus went to Spain and get their assistance to find a new path to India, unwittingly discovering the New World for the first time by mainland Europeans. Francis I, who was King of France, helped push the arts from France to Italy. Bitter rivalries formed, and as new ideas came to be, so too did humanity as a species.

1) The Renaissance came after which of the following time-periods?

A: The Dark Ages **B:** The Middle Ages

C: The period after the Fall of the Roman Empire

D: All the above

2) In which of the following places did the Renaissance start?

A: Rome **B:** Florence **C:** Venice **D:** Milan

3) Which of the following did the Italians try to be more like?

A: Ancient Greeks **B:** French **C:** Ancient Romans **D:** A and C

4) Which of the following was the Father of Humanism?

A: Leonardo Davinci **B:** Cicero **C:** Francesco Petrarch **D:** Virgil

5) All the following describe Leonardo da Vinci EXCEPT:

A: Politician **B:** Engineer **C:** Painter **D:** Scientist

6) Which of the following is thought to have originally sparked the Renaissance?

A: The Mona Lisa **B:** Black Plague **C:** City-States **D:** Realistic Painting

Renaissance Choice Board

Choose any two (2) pieces to work on.

Verbal / Linguistic Write a book review on a Renaissance work or a trailer for a movie based on the Renaissance.	**Musical / Rhythmic** Write a theme song for the Renaissance.	**Visual / Spatial** Make a movie poster casting Renaissance artists/writers as the lead characters.
Logical / Mathematical Describe a sequence of events that led to a major idea/invention during the Renaissance era.	*Wild Card* *Anything you decide but be creative.*	**Bodily / Kinesthetic** Create a skit based on the Renaissance.
Sports Enthusiast Write a play-by-play for the Renaissance as if it were a sporting event.	**Interpersonal** Interview a Renaissance figure(s).	**Intrapersonal** Create a resume for a known artist/writer applying to join the Renaissance.

Name: _____

Date: _____

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Renaissance Art

The Renaissance patrons wanted art that showed joy in human beauty and life's pleasures. Renaissance art is more lifelike than in the art of the Middle Ages. Renaissance artists studied perspective, or the differences in the way things look when they are close to something or far away. The artists painted in a way that showed these differences. As a result, their paintings seem to have depth.

An artist from Florence named Giotto was one of the first to paint in this new style. Giotto lived more than a century before the beginning of the Renaissance, but his paintings show real emotion. The bodies look solid, and the background of his paintings shows perspective. The art produced during the Renaissance would build upon Giotto's style.

Leonardo da Vinci was born in 1452 in the village of Vinci. His name means Leonardo of Vinci. Leonardo began his career working for a master painter in Florence. By 1478, Leonardo left his master and set up his own workshop. People have been trying to guess the secret behind the smile of his *Mona Lisa* ever since he painted it around 1505. His *Last Supper* shows clearly the different feelings of Jesus and his followers.

Leonardo's fame grew—but not just for his painting. Leonardo was truly a "Renaissance Man," skilled in many fields. He was a scientist and an inventor as well as an artist. He made notes and drawings of everything he saw. Leonardo invented clever machines, and even designed imitation wings that he hoped would let a person fly like a bird.

Michelangelo Buonarroti of Florence was one of the greatest artists of all time. Like Leonardo, Michelangelo was a "Renaissance Man" of many talents. He was a sculptor, a painter, and an architect. When Michelangelo carved a statue of Moses, he included veins and muscles in the arms and legs.

The ceiling of the Sistine Chapel is one of the world's most famous paintings, but not everyone was happy with Michelangelo's work. Cardinal Biagio de Cesena noted that the crowd of more than 300 human figures would be more appropriate in a wine shop than in a papal chapel. Michelangelo responded to this criticism by adding a portrait of Biagio among the figures of the damned in the scene of the Last Judgment.

Michelangelo was a devout Christian, and the church was his greatest patron. He designed the dome of St. Peter's church in Rome. Nearby, Michelangelo's paintings cover the ceiling of the Sistine Chapel, the building where new popes have been selected for more than five hundred years. Michelangelo's painting illustrates the Book of Genesis, with scenes that span from the Creation to the Flood. The project was very difficult. Working alone, Michelangelo had to lie on his back atop high scaffolding while he painted the vast ceiling.

Answer in Complete Sentences

*1. How was Renaissance art different from the art that preceded it?

*This is a higher order learning question. You will earn credit for any reasonable answer.

Name: _____
Date: _____

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Fill in the Blanks

Renaissance artists and their p_____ expressed themselves through *p_____ and sculpture long before the advent of the electronic media. Renaissance p_____ wanted a____ that showed j____ in human b_____ and life's p_____. Renaissance a____ is more l_____ than the a____ of the M_____ A_____. Renaissance artists studied p_____, or the d_____ in the w____ things l_____ when they are c_____ to s_____ or f____ away. Perspective gave R_____ paintings the illusion of d_____.

A Florentine a_____ named G_____ was one of the f_____ to p_____ in this n____ style. Giotto's p_____ showed real e_____. People and objects are less *f_____ in his work. Leonardo da V_____ was a man of many t_____. Leonardo's art included the mysterious *M_____ L_____*, but he was a "R_____ Man," with s_____ in many fields. L_____ was also a s_____ and an i_____. Like Leonardo, M_____ Buonarroti was another "R_____ Man." Michelangelo was famous as a s_____, a p_____, and an a_____. He d_____ the d_____ of St. P_____'s church in R_____. Nearby, M_____'s paintings cover the c_____ of the S_____ Chapel.

Answer in Complete Sentences

2. What was unique about Michelangelo's *Moses*?

3. What did Michelangelo paint on the ceiling of the Sistine Chapel?

*4. Why would the church want a Michelangelo's painting on the ceiling of the Sistine Chapel?

*This is a higher order learning question. You will earn credit for any reasonable answer.

Art and Artist of the Renaissance Worksheet

Directions: Fill in the table to complete the information about each work and artist/author of the Renaissance.

Work	Artist/Author	Description
The Last Supper		A fresco depicting Jesus with his disciples on the eve of his crucifixion; currently the subject of great speculation.
	Leonardo da Vinci	Small portrait of a woman that captures the artist's craftsmanship and the realism of the Renaissance style.
The Last Judgment		Also in the Sistine Chapel, this fresco features Jesus escorting the chosen to Heaven and condemning the lost to Hell.
	Michelangelo	Marble statue of Moses.
David		Free standing statue in marble of the young Jewish man with a sling over his shoulder as he appears to contemplate the slaying of Goliath.
David		Free standing work in bronze that portrays the subject nude with a large hat and slightly effeminate.
	Raphael	Painted this theme multiple times and demonstrates the artistic refinement of the Renaissance Artist.
The School of Athens		A Fresco depicting Plato and Aristotle, and many other scholars, painted on the wall of the Pope's Library in the Vatican.
	Albretch Dürer	Oil on canvass painting that depicts the wise men bringing their gifts to the newborn Jesus. Demonstrates the Northern Renaissance command of realism.
Giovanni Arnolfini and Bride		Painting of a man and his (rather pregnant bride) with great attention to detail, such as the reflection in the mirror and the chandelier.
Architecture		
St. Peter's Cathedral in the Vatican		The colonnade that leads to this Cathedral represents the open arms of the Roman Catholic Church in Rome.
	Brunelleschi	An architectural masterpiece that shows how the Roman dome could be expanded into a Renaissance work.

Art and Artist of the Renaissance Worksheet

Directions: Fill in the table to complete the information about each work and artist/author of the Renaissance.

Work	Artist/Author	Description
Writers		
	William Shakespeare	A tragic story of a man whose father is killed by his uncle, who then marries his mother, and is intertwined with other relationship issues and plot twist.
The Taming of the Shrew, & *A Midsummer's Night Dream*		A collection of comedies by the English playwright that focuses on human relationships and flights of fancy. (definitely not Medieval)
The Divine Comedy		Story written in the vernacular (Italian) which tells the story of a man's journey through heaven and hell.
	Geoffrey Chaucer	Series of stories depicting the lives of whole social spectrum on a pilgrimage to the shrine of Beckett at the Canterbury Cathedral in England
	Baldassare Castiglione	Book that describes what a nobleman should behave like and what they should strive to be, classically educated and have skills for the military.
Decameron		Written in 1353, it is a collection of novellas (stories) that demonstrate life in the times and portrays many of the Renaissance attitudes.
The Handbook of the Christian Knight		A work of a Christian Humanist, The Handbook speaks clearly and logically to Christian concerning how their secular lives should reflect their spiritual lives.
	Erasmus	Book in which Erasmus criticizes the areas of society that were in most need of reform, such as monasteries and church corruption.
	Machiavelli	First work of political science, instruction manual for the Prince to do what is necessary to stay in power and stability.
Utopia		Utopia, a work of fiction, tells the story of a land that is almost perfect in every way and serves as an example of what the world should be. More is known as the "Man for all Seasons" because of his versatility.

Art and Artist of the Renaissance: Teacher's Guide

The shaded boxes are the correct responses that the student will need to fill in.

Art work	Artist	Description
The Last Supper	Leonardo da Vinci	A fresco depicting Jesus with his disciples on the eve of his crucifixion; currently the subject of great speculation.
Mona Lisa	Leonardo da Vinci	Small portrait of a woman that captures the artist's craftsmanship and the realism of the Renaissance style.
The Last Judgment	Michelangelo	Also in the Sistine Chapel, this fresco features Jesus escorting the chosen to Heaven and condemning the lost to Hell.
Moses	Michelangelo	Marble statue of Moses.
David	Michelangelo	Free standing statue in marble of the young Jewish man with a sling over his shoulder as he appears to contemplate the slaying of Goliath.
David	Donatello	Free standing work in bronze that portrays the subject nude with a large hat and slightly effeminate.
"Madonnas"	Raphael	Painted this theme multiple times and demonstrates the artistic refinement of the Renaissance Artist.
The School of Athens	Raphael	A Fresco depicting Plato and Aristotle, and many other scholars, painted on the wall of the Pope's Library in the Vatican.
Adoration of the Magi	Albretch Dürer	Oil on canvass painting that depicts the wise men bringing their gifts to the newborn Jesus. Demonstrates the Northern Renaissance command of realism.
Giovanni Arnolfini and Bride	Jan van Eyck	Painting of a man and his (rather pregnant bride) with great attention to detail, such as the reflection in the mirror and the chandelier.
Architecture		
St. Peter's Cathedral in the Vatican	Michelangelo	The colonnade that leads to this Cathedral represents the open arms of the Roman Catholic Church in Rome.
Dome of the Cathedral of Florence	Brunelleschi	An architectural masterpiece that shows how the Roman dome could be expanded into a Renaissance work.

Art and Artist of the Renaissance: Teacher's Guide

The shaded boxes are the correct responses that the student will need to fill in.

Art work	Artist	Description
Writers		
Hamlet	William Shakespeare	A tragic story of a man who's father is killed by his uncle, who then marries his mother, and is intertwined with other relationship issues and plot twist.
As You Like It, The Taming of the Shrew, & *A Midsummer's Night Dream*	William Shakespeare	A collection of comedies by the English playwright that focuses on human relationships and flights of fancy. (definitely not Medieval)
The Divine Comedy	Dante	Story written in the vernacular (Italian) which tells the story of a man's journey through heaven and hell.
The Canterbury Tales	Geoffrey Chaucer	Series of stories depicting the lives of whole social spectrum on a pilgrimage to the shrine of Beckett at the Canterbury Cathedral in England.
The Book of the Courtier	Baldassare Castiglione	Book that describes what a nobleman should behave like and what they should strive to be, classically educated and have skills for the military.
Decameron	Boccaccio	Written in 1353, it is a collection of novellas (stories) that demonstrate life in the times and portrays many of the Renaissance attitudes.
The Handbook of the Christian Knight	Erasmus	A work of a Christian Humanist, The Handbook speaks clearly and logically to Christian concerning how their secular lives should reflect their spiritual lives.
In Praise of Folly	Erasmus	Book in which Erasmus criticizes the areas of society that were in most need of reform, such as monasteries and church corruption.
The Prince	Machiavelli	First work of political science, instruction manual for the Prince to do what is necessary to stay in power and stability.
Utopia	Thomas More	*Utopia*, a work of fiction, tells the story of a land that is almost perfect in every way and serves as an example of what the world should be. More is known as the "Man for all Seasons" because of his versatility.

Renaissance Writers

Francesco Petrarch

Francesco Petrarch was one of the earliest and most influential humanists. Some have called him the *father of Renaissance humanism*. He was also a great poet. Petrarch *wrote both in Italian and in Latin*. In Italian, he wrote sonnets – 14 line poems. They were about a mysterious woman named Laura, who was his ideal. (Little is known of Laura except that she died of the plague in 1348.) In *classical Latin*, he wrote letters to many important friends.

Niccolo Machiavelli

The Prince (1513) by Niccolo Machiavelli also examines the imperfect conduct of human beings. It does so by taking the form of a political guidebook. In *The Prince*, Machiavelli examines how a ruler can gain power and keep it in spite of his enemies. In answering this question, he began with the idea that most people are selfish, fickle, and corrupt.

To succeed in such a wicked world, Machiavelli said, a prince must be strong as a lion and shrewd as a fox. He might have to trick his enemies and even his own people for the good of the state. In *The Prince*¸ Machiavelli *was not concerned with what was morally right, but with what was politically effective*.

He pointed out that most people think it is praiseworthy in a prince to keep his word and live with integrity. Nevertheless, Machiavelli argued that in *the real world of power and politics a prince must sometimes mislead the people and lie to his opponents*. As a historian and political thinker, Machiavelli suggested that in order for a prince to accomplish great things, he must be crafty enough to not only overcome the suspicions but also gain the trust of other.

Christian Humanists

Humanists believe in human potential, but many lost faith in God. When the Italian humanist ideas reached the north, people used them to *examine the traditional teachings of the Church*. The northern humanists were critical of the failure of the Christian Church to inspire people to live a Christian life. This criticism produced a new movement known as Christian humanism. The focus of Christian humanism was the *reform of society.* Of particular importance to humanists was education.

Desiderius Erasmus

The best known of the Christian humanists was Desiderius Erasmus of Holland. In 1509, Erasmus wrote his most famous work, *The Praise of Folly*. This book poked fun at greedy merchants, heartsick lovers, quarrelsome scholars, and pompous priests. Erasmus believed in a *Christianity of the heart*, *not one of ceremonies or rules*. He thought that in order to improve society, all people should study the Bible.

Dante Alighieri

Renaissance writers produced works that reflected their time, but they also used techniques that writers rely on today. Some followed the example of the medieval writer Dante. *He wrote in the vernacular*, or the *everyday language of his homeland.* Dante wrote in his native language, instead of Latin. Dante's native language was Italian. He is most known for his work in writing *The Divine Comedy* in Italian. Since most people couldn't read or understand Latin, these works written in the vernacular brought literature to many people.

Johann Gutenberg

During the 13th century, block printed items reached Europe from China. European printers began to use block printing to create whole pages to bind into books. However, this process was too slow to satisfy the Renaissance demand for knowledge, information, and books.

Around 1440, Johann Gutenberg, a craftsman from Mainz, Germany, *developed a printing press that incorporated a number of technologies in a new way.* The process made it possible to produce books quickly and cheaply. Using this improved process, Gutenberg printed a complete Bible, the Gutenberg Bible, in about 1455. It was the first full-sized book printed with movable type.

The printing press enabled a printer to *produce hundreds of copies of a single work.* For the first time, books were c*heap enough that many people could buy them.* At first printers produced mainly religious works. Soon they began to provide books on other subjects such as travel guides and medical manuals. Literacy and education rose along with the invention of the printing press.

Name _____

Renaissance Writers

Use information from the Renaissance Writers to complete the tables.

Gutenberg:

1. Francesco Petrarch

2 Important Facts	How are you similar or different to him?	Picture that represents him

2. Niccolo Machiavelli

2 Important Facts	Do you agree that leaders might have to trick his own people sometimes to be effective?	Picture that represents him

3. Christian Humanists

2 Important Facts	How can Christian humanists focus on "human potential" while also focusing on sacred things?	Picture that represents them

4. DESIDERIUS ERASMUS

2 Important Facts	Why do you think the Praise of Folly got so famous?	Picture that represents him

5. DANTE ALIGHIERI

2 Important Facts	Why was writing in the vernacular helpful in spreading literacy?	Picture that represents him

6. JOHANN GUTENBERG

2 Important Facts	Who was more influential: Johann Gutenberg or Steve Jobs (Apple founder)? Why?	Picture that represents him

Review: Come up with one word to summarize each person below:

*Petrarch →

*Machiavelli →

*Christian Humanists →

*Erasmus →

*Dante →

*Gutenberg →

Name _____ Date _____

The Medici Family

By Sharon Fabian

Many kids and teens like to ride skateboards in their free time. Not many people skate full time, but a few do. How do they do it? Full-time skaters often have a sponsor. This sponsor may be the owner of a company who thinks that the skater will be good advertising for his business.

Maybe the sponsor is a shoe company. The sponsor pays the skater and arranges tours. Everywhere the skater goes, he wears the sponsor's latest shoes. The skater gets to skate, and the sponsor gets what he wants too " in this case, advertising.

Something similar was going on in Renaissance Europe. Families of rich businessmen sponsored artists and other creative people. The artists got to spend all of their time painting. The sponsors, known as patrons of the arts, got what they wanted " in this case a big dose of culture for their favorite city.

One of the biggest sponsors of Renaissance talent was the Medici family. They made Florence, Italy, and the land surrounding it, known as Tuscany, a center of Renaissance culture. The area has remained a cultural center ever since.

The rise of the Medici family in Florence began in the 1200's. Then, in the late 1300's, Giovanni di Bicci de'Medici brought the family to prominence. Giovanni was a banker. His banking business prospered, and his family went on to become bankers for the pope. Giovanni was elected ruler of Florence, and his descendants would continue to rule for years to come.

Giovanni's son, Cosimo de'Medici, born in1389, was a powerful ruler of Florence. By this time, the Medici family was both rich and powerful. Cosimo became involved in a rivalry between the Medici family and the rival Albizzi family. At one time, he was even banished from the city of Florence. He soon returned and became a great patron of the arts. He sponsored artists including Brunelleschi, Donatello, and Fra Angelico. He also opened the world's first public library.

Lorenzo, born in 1449, was also a businessman, politician, and patron of the arts. He sponsored some of the most famous names of the Renaissance including Botticelli and Michelangelo.

In the 1500's, two members of the Medici family were elected pope " Pope Leo X and Pope Clement VII. This was a time of trouble for the Medici family. The Medici popes, and other popes of that era, were accused of abusing the wealth and power of the church.

Cosimo I was born in 1519. He had been trained in the family business and was also well educated in philosophy. He became one of the first people in the Renaissance to be called a Humanist, because of his belief in the value of individual human beings. He married into a royal family and was crowned Grand Duke of Tuscany in 1569.

These are only a few members of the rich and powerful Medici family. Some members of this large family were popular rulers, and others became infamous for ruling like tyrants, but the Medici family is best remembered today for their patronage of the arts. They continued to influence and sponsor artists throughout the Renaissance period. Their financial support allowed artists like Michelangelo to spend their time focusing on their painting rather than on earning a living. The Medici family also sponsored writers, philosophers, architects, and scientists. With the support of the Medici family, Tuscany became known for having the largest library in Europe. Florence became a center of Humanism and culture.

Name _____ Date _____

The Medici Family

Questions

_____ 1. Patrons of the arts _____.

A. carve sculptures
B. teach painters how to paint
C. provide financial support
D. paint picture

_____ 2. The Medici family _____.

A. ruled Florence
B. were rich businessmen
C. sponsored artists
D. all of the above

_____ 3. Members of the Medici family included _____.

A. Tuscany
B. Donatello
C. Michelangelo
D. Cosimo

_____ 4. According to the article, Giovanni's greatest accomplishment was in _____.

A. painting
B. government
C. architecture
D. banking

_____ 5. Giovanni's son, Cosimo, was _____.

A. neither
B. a patron of the arts
C. a powerful ruler
D. both

_____ 6. The painter Botticelli was sponsored by _____.

A. Giovanni
B. Michelangelo
C. Donatello
D. Lorenzo

_____ 7. The Medici Popes were accused of _____.

A. abusing wealth and power
B. refusing to sponsor artists
C. passing unfair laws
D. stealing from artists

_____ 8. In 1569, _____ became the Grand Duke of Tuscany.

A. Pope Leo X
B. Cosimo I
C. Pope Clement VII
D. Cosimo

Name _____ Date _____

Describe what you think the everyday life of an artist like Michelangelo would have been like without the sponsorship of a rich patron.

How was patronage of artists in the Renaissance similar to sponsorship of skateboarders today? How was it different?

"Pardon the Interruption, de Medici Style"

Research the autobiographies of the Medici family. Write whatever details you find on them in the column below. Give specific details about their contribution to the Renaissance.

Family Member	Who were they AND what made them so important
Cosimo il Vecchio de Medici	
Lorenzo de Medici	
Piero de Medici	
Pope Leo X	
Cosimo I	
Clement VII (Giulio de Medici)	
Catherine de Medici	
Anna Maria Luisa de Medici	

THEIR PLACE IN HISTORY

Directions: Read each statement and mark whether or note you agree with it. Then use the space below to explain your position.

1. The Medici were among the world's greatest are patrons. Yes _____ No _____

2. Most in the Medici Family were true humanists. Yes _____ No _____

3. The Medici used their wealth to gain power in Florence. Yes _____ No _____

4. The Medici Family held its position by dishonest means. Yes _____ No _____

5. While most Medici were not kings or queens, they were very important in Europe. Yes _____ No _____

TEST NAME: **Revision The Renaissance (COPY)**
TEST ID: **3675460**
GRADE: **07 - Seventh Grade**
SUBJECT: **Social Sciences and History**
TEST CATEGORY: **My Classroom**

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Student:

Class:

Date:

Instructions

Read the following questions carefully then choose the best answer. Answer all questions.

1. In the Renaissance period, which factor was emphasized by the philosophy of humanism?

   A. Superiority of medieval thought
   B. Value of the individual
   C. Devotion to religion

2. One major characteristic of the Renaissance period is that the

   A. Catholic Church no longer had any influence in Europe
   B. Cultures of Greece and Rome were revived and imitated
   C. Manor became the center of economic activity
   D. Major language of the people became Latin

3. The European Renaissance was responsible for which of the following?

   A. discouraged the growth of strong monarchs
   B. encouraged people to question tradition
   C. were led by the military
   D. supported the return of the Roman Empire

4. In which way were the developments of the Renaissance in Italy similar to the developments of the Tang dynasty in China?

   A. The rebirth of art, technology, and learning was a central theme in both regions.
   B. Religious reform was a main focus in both regions.
   C. Warfare and insurrection led to the devastation of both societies.
   D. The peasant class was responsible for the emergence of both eras.

5. Which was a major characteristic of the Renaissance?

A. Conformity
B. Mysticism
C. Humanism
D. Obedience

6. Which of the following best describes the Renaissance in Western Europe?

A. Unquestioned reliance on the teachings of Aristotle
B. Christian unity throughout the region
C. An advance of Muslim culture
D. Great intellectual and artistic creativity

7. How are the Renaissance and the Enlightenment similar?

A. produced major cultural changes
B. limited technological advancements
C. encouraged traditional values
D. ignored individual achievements

8. Which statement concerning the Renaissance in Europe is based on opinion rather than on fact?

A. Literature began to appear in languages other than Latin.
B. Art reflected the ideas of humanism and individualism.
C. The art of the Northern Renaissance was superior to that of the Italian Renaissance.
D. Art produced during the Renaissance had religious as well as secular themes.

9. 10. How did Italy's location help make it the starting point of the Renaissance.

A. Many libraries were located here
B. Leading Greek scholars moved there.
C. As trade declined, people turned to the arts.
D. Mediterranean trade brought wealth there.

10. 10. How did the Medici family make Florence the birthplace of the Renaissance?

A. They built a Roman Catholic Church there

B. They made the peasants work over time without extra pay

C. They made Florence the capital of Europe

D. They hired artists and architects (patrons).

11. 12. What economic change occurred during the Renaissance that allowed for the flourishing of the art?

A. Introduction of paper money

B. People began to Barter again

C. The Governments of Europe paid to educate Artists

D. Growth of a wealthy Merchant Class that became patrons the Arts

12.

13.Leonardo Da Vinci, Michelangelo, Raphael and Donatello were famous Renaissance:

A. scientists.

B. philosophers.

C. artists.

D. priests.

13.

14. Which of the following statements describes the type of government which existed in Florence during the Renaissance?

A. It was a small Italian town ruled by the king of Italy in Rome.

B. It was a city-state ruled by the wealthy Medici family.

C. It was completely under the control of the Catholic Church.

D. It was the capital of Italy and had a large bureaucracy.

14.

14.

_____ art was flat with rigid, emotionless figures, while _____ art had full backgrounds with figures that showed emotion and detail.

A. Medieval, Renaissance

B. Classical, Medieval

C. Renaissance, Classical

D. Renaissance, Medieval

15.

15. One of the most important ideas from the Renaissance that allowed ideas to spread more quickly.

A. Printing Press

B. Building designer

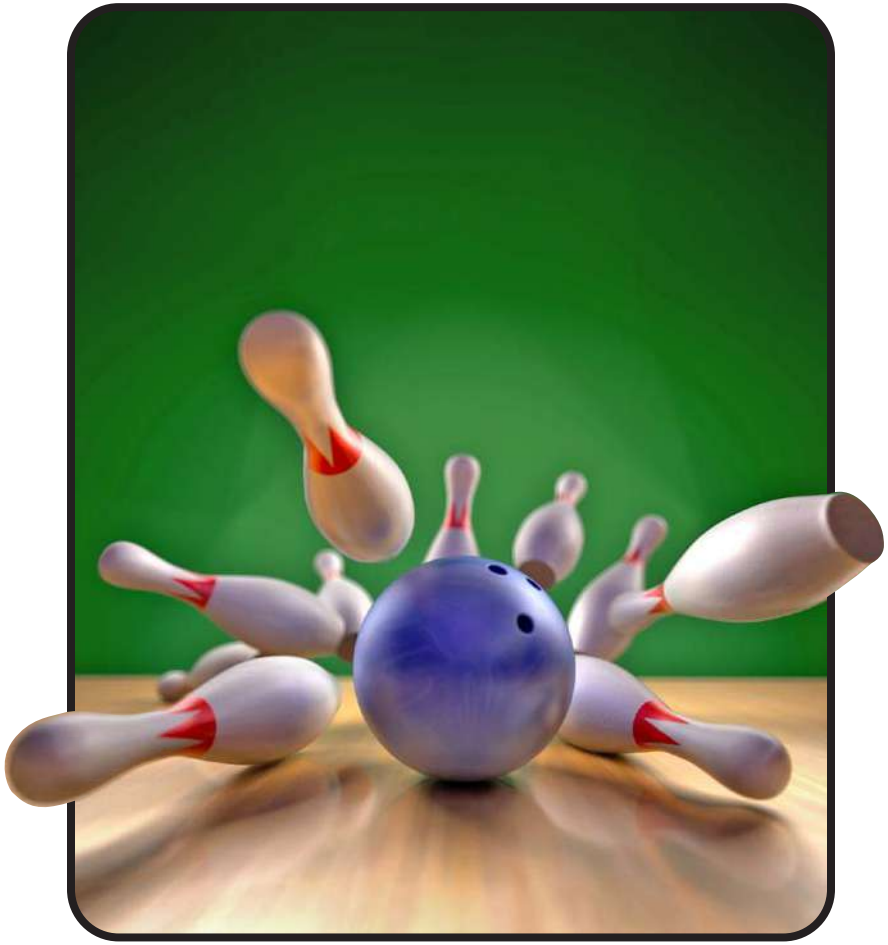
C. Perspective

D. Greece and Rome

Force and Motion

A Science A–Z Physical Series

Word Count: 1,746



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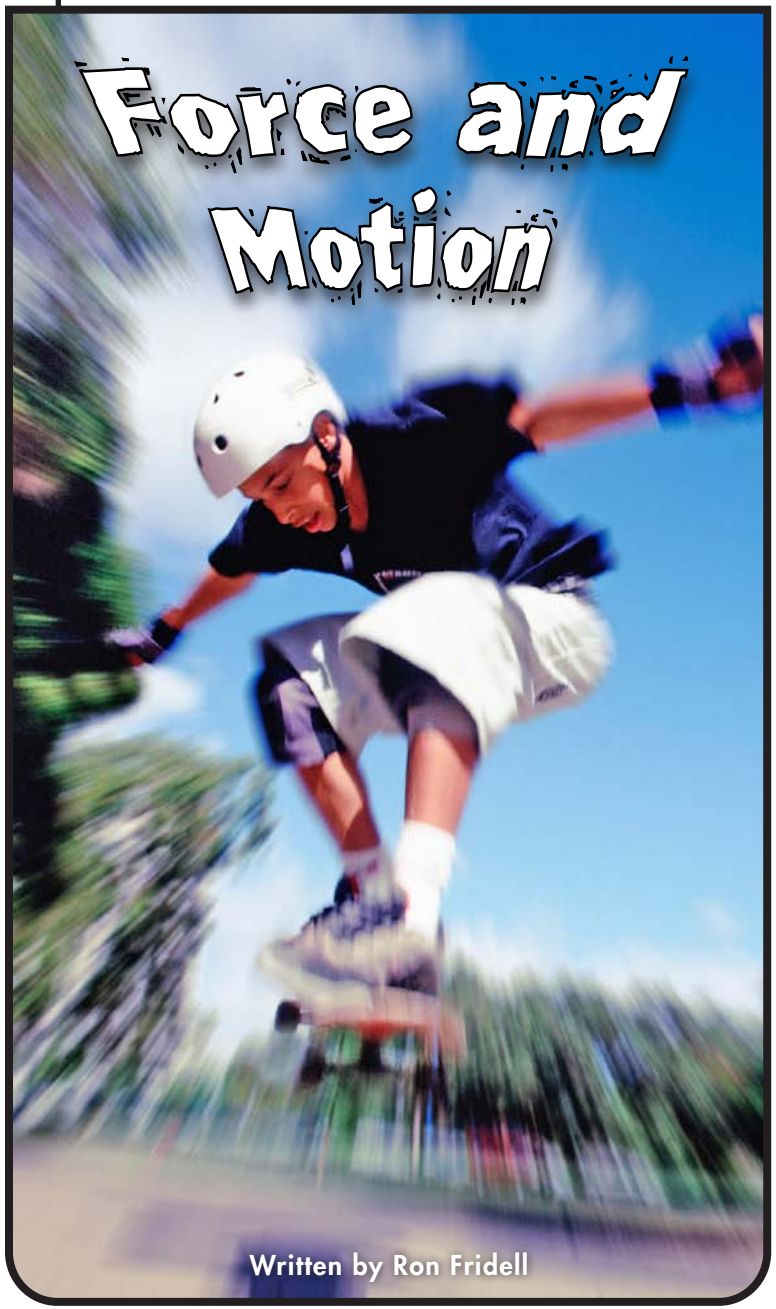

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Force and Motion

Written by Ron Fridell

www.sciencea-z.com

KEY ELEMENTS USED IN THIS BOOK
The Big Idea: Force and motion are fundamental to all matter in the universe. A force is anything that can push or pull on an object. Forces influence objects that are at rest or that are already in motion. Isaac Newton's three laws of motion involve inertia, mass, velocity, and momentum. Key forces include gravity, friction, and magnetism. A force is required to do work, and generating a force requires energy. Energy can be stored as potential energy, or it can have kinetic energy—the energy of motion. Energy can also be converted and exchanged through energy transfer. Objects move in predictable ways. By learning about force and motion, we come to understand how using forces can produce motions that allow us to be safe and to enjoy ourselves.
Key words: attract, direction, distance, electricity, electromagnetism, energy, energy transfer, engine, force, friction, generator, gravity, heat energy, inertia, kinetic energy, law, light energy, lines of force, magnetic field, magnetism, mass, momentum, motion, potential energy, reaction, repel, rest, sound energy, speed, velocity, weight, work
Key comprehension skills: Cause and Effect *Other suitable comprehension skills:* Classify information; compare and contrast; elements of a genre; identify facts; interpret charts, graphs, and diagrams; main idea and details
Key reading strategy: Visualize *Other suitable reading strategies:* Ask and answer questions; connect to prior knowledge; retell; summarize

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Introduction

Each word above tells how objects can move. Some travel in a straight, flat line, such as a ball rolled along the ground. When you kick the ball into the air, it flies in a curved path until it bounces on the ground. A merry-go-round turns in circles, while lightning strikes in a jagged path.

Motion is all around you. It's even inside you as your blood moves through your body.

For every motion, there is a **force**. In this book, you will learn about the forces that make things move, stop, and change **direction** or **speed**.

Motion Needs a Force

To make something move, a force is needed. Lifting, pushing, and pulling are all forces. At times, a person provides the force. When you lift a stack of books, push a broken-down car, or pull a rope in a tug-of-war game, you are the force.

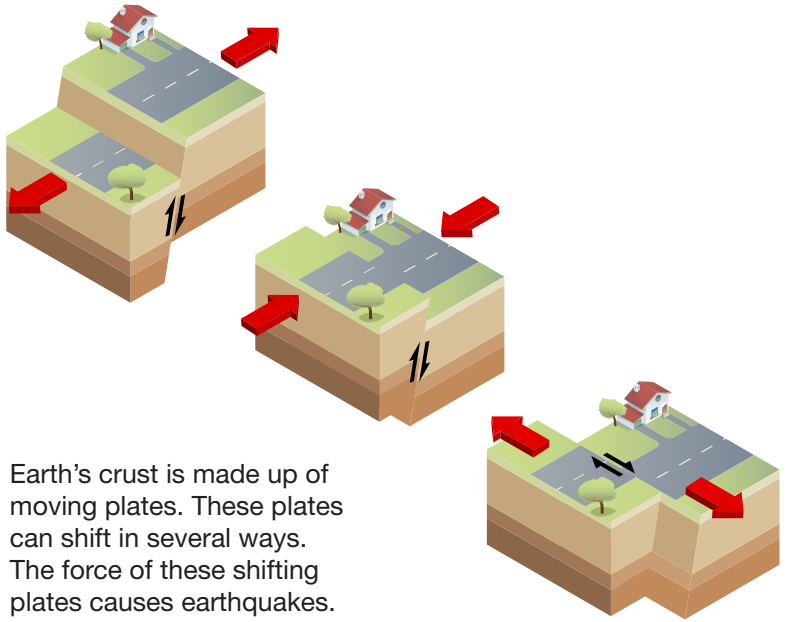
lift

push

pull

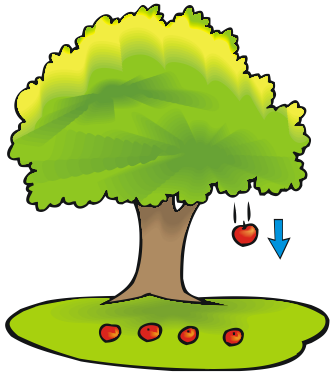
Machines can provide force to create motion. A huge engine can produce enough force to propel a massive rocket into space. Motors in cake mixers, fans, and blenders use electrical force to make things move.

Nature can also be a strong force. Breezes make leaves dance in the treetops. Ocean waves make boats bob up and down. Forces deep underground cause earthquakes that make the ground tremble.



Earth's crust is made up of moving plates. These plates can shift in several ways. The force of these shifting plates causes earthquakes.

The Laws of Motion



Much of what we know about motion comes from scientists who lived hundreds of years ago. They conducted tests on moving objects. British scientist Isaac Newton discovered **gravity**, the invisible force that causes things to fall toward the ground. You may have heard that he was sitting under a tree one day when a falling apple hit him on the head. The story goes that this accident led him to discover gravity.

Isaac wasn't really hit on the head by a falling apple. That's just a myth. But over time, he observed that objects always fall down toward the ground. And that led him to discover gravity.

SIR ISAAC NEWTON (1642–1727)

Isaac Newton lived on a farm in England. Instead of farming, he chose to study math and science in London. At age 27, Isaac did experiments with light. He was the first to suggest that light was actually made up of all the colors of the rainbow. He is now one of the most famous scientists of all time!

Newton's First Law of Motion

Isaac Newton is known for his three laws of motion, which explain how things move. The first part of the first law says that an object at rest will remain at rest unless a force acts upon it. For example, your bike will stay parked where it is unless something moves it.

Word Wise

In government, a *law* is a rule that people must obey. In science, a law is a statement that explains how things always work in the physical world.

The second part of this law states that an object in motion will continue moving in the same way unless a new force changes the motion. It will keep moving at the same speed and in the same direction. So your moving bike will continue moving at the same speed and in the same direction until you pedal faster, coast, brake, or turn.

Why is it important to wear a seat belt? Think about Newton's first law of motion.

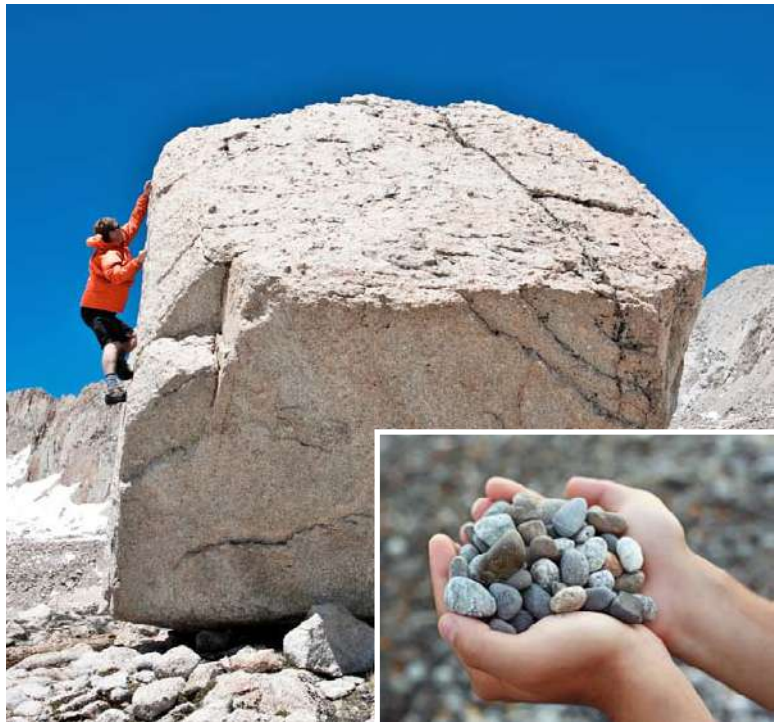
Every object, at rest or in motion, has **inertia**. Inertia is what makes an object keep doing what it is already doing. An object at rest will remain at rest unless a force moves it. An object in motion will remain in motion unless a force stops it. Newton's first law of motion is sometimes called the Law of Inertia.

An object has inertia whether it is at rest or in motion. In either case, a force must overcome that inertia. The force may create motion, stop it, or change its direction.

Newton's Second Law of Motion

Mass is the amount of matter in an object. Newton's second law of motion deals with mass and motion. It explains that an object's motion depends upon its mass and the amount of force needed to move that mass.

Why is it easier to move a small rock than a boulder? Since a boulder has much more mass than a small rock, much more force is needed to overcome the boulder's inertia. Much less force is needed to make small rocks move, stop, or change direction.



This train has a large mass and a high speed, so it has a lot of momentum. It would take a very strong force to slow or stop this train!

This law of motion also deals with speed. Speed measures how far something travels in a certain amount of time. The faster an object moves, the more force is needed to stop it.

Think about a locomotive speeding down a track. It has a lot of mass and speed. So a great deal of force will be needed to overcome the inertia of the train's motion and make it stop.

Momentum is the amount of force in a moving object. The more speed and mass a moving object has, the more momentum it has. A small, slow scooter can stop much faster than a massive, fast train can.

Word Wise

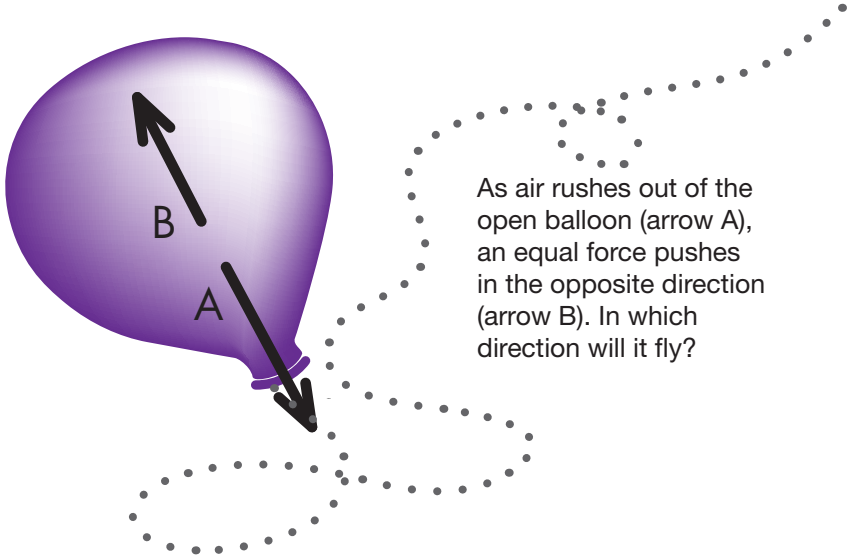
Velocity describes an object's speed in a certain direction. Scientists calculate momentum by using this formula:

MASS x VELOCITY = MOMENTUM

Newton's Third Law of Motion

Newton's third law of motion says that for every force or action, there is an equal and opposite reaction. So, if you lift a 9 kg (20 lb.) box, the box pulls down with an equal force of 9 kg (20 lbs.) in the opposite direction.

This law explains why a balloon full of air goes flying when you let it go without tying it. Air rushes out the open end. An opposite force pushes on the far end of the balloon, making it fly.



As air rushes out of the open balloon (arrow A), an equal force pushes in the opposite direction (arrow B). In which direction will it fly?

Types of Forces

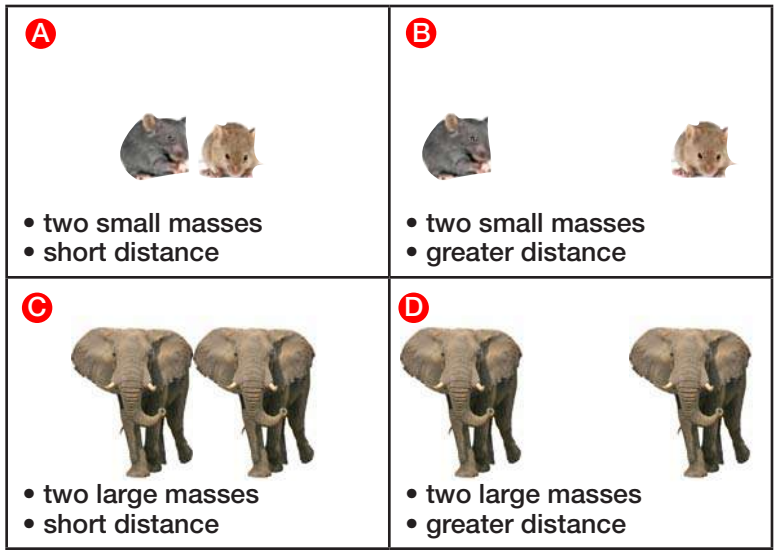
You've learned that people, machines, and nature can all provide a force. Here are three more forces you should be familiar with.

Gravity

Isaac Newton observed that all objects pull on each other due to gravity. His findings became known as the Universal Law of Gravity. The pull of gravity depends on the mass of the objects and the **distance** between them. Greater masses have a stronger pull. If they move farther apart, the pull between them gets weaker.

MASS, DISTANCE, AND GRAVITY

In which situation is the gravitational pull strongest?
In which situation is the gravitational pull weakest?



Strongest: C; Weakest: B

Imagine standing next to a tall building. Both you and the building have mass, so you both exert a gravitational pull. The building has much more mass, so it pulls on you much more than you pull on it.

However, both you and the building are standing on Earth. Planet Earth is far more massive than either you or the building. So Earth exerts a much stronger gravitational pull on you and the building than you and the building exert on each other.

On Earth, an object's mass is measured as **weight**. The greater the mass of an object, the more the force of Earth's gravity pulls on it, and the more it weighs.

If you were in space, twice as far from the center of Earth as you are now, the pull of gravity would be only one-quarter as strong. You would still have the same mass, but you would weigh only one-quarter of what you weigh on Earth.

Now let's move from Earth to the Sun. The Sun has much more mass than anything else in our solar system. It exerts enough gravitational pull to keep all the planets from flying off into space. Instead, they orbit the Sun.

Remember, distance is also important. While the Sun exerts more gravitational pull than Earth, you are much closer to Earth than to the Sun. So Earth's gravity keeps you from getting pulled up to the Sun!

Friction

Friction is an invisible force that both slows down moving things and heats them up. One kind of friction you know well is *sliding friction.* When you rub your hands together, they create sliding friction. This friction produces heat energy, causing your skin to warm up.

A rolling bowling ball has another kind of friction—*rolling friction.* Rolling friction will slow down a moving object, but not as much as sliding friction does. Placing rollers under a box makes it easier to move. Rolling reduces friction.

Do You Know?

Rough surfaces exert more friction against each other than smooth surfaces do. Putting a lubricant such as oil or grease between two surfaces will reduce friction.

Fluid friction happens when an object moves through a fluid, such as water or air. You can move your finger through water faster than honey because honey creates more fluid friction than water. Engineers design airplanes to reduce the fluid friction caused by the air. Fluid friction can help objects move more easily, such as a puck floating on air in an air hockey game.

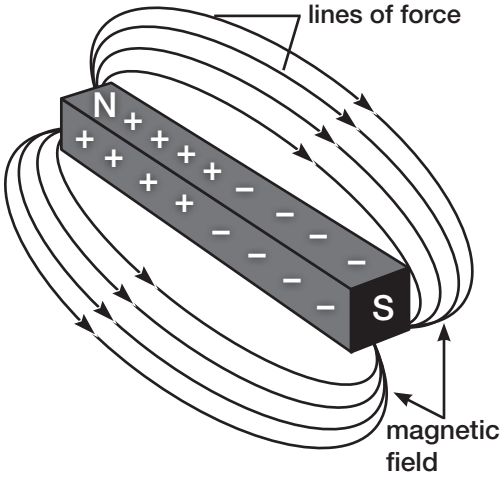
Think About It

Imagine that you wanted to race your friends down a snowy hill. How could thinking about friction help you win the race?

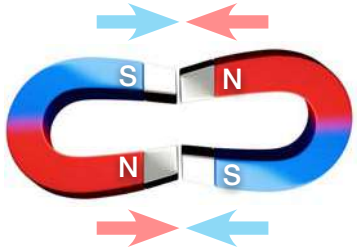
Magnetism

Magnetism can push or pull objects made of certain metals, such as iron. Magnets also push and pull each other.

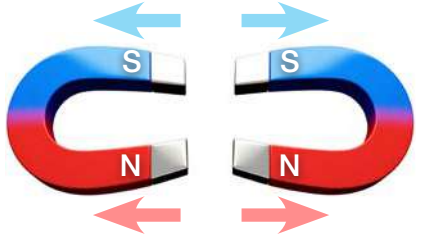
The force of magnetism can move objects without touching them. How? Invisible *lines of force* enter and leave at opposite ends, or *poles*, of a magnet. The magnet attracts certain objects that enter its magnetic field.



Each magnet has a north and south pole. Two opposite poles *attract* each other. But two of the same poles *repel*, or push each other away.



Opposite poles attract.

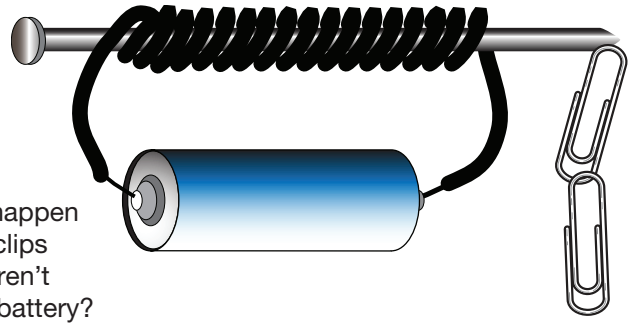


Like poles repel.

Generators like these use magnets to make electricity flow through wires.

Magnets can make electricity flow through wires. Power plants use magnets to produce electricity.

On the other hand, electricity can turn some metals into magnets. Electricity and magnetism are part of a single force called **electromagnetism**.



What would happen to the paper clips if the wire weren't touching the battery?

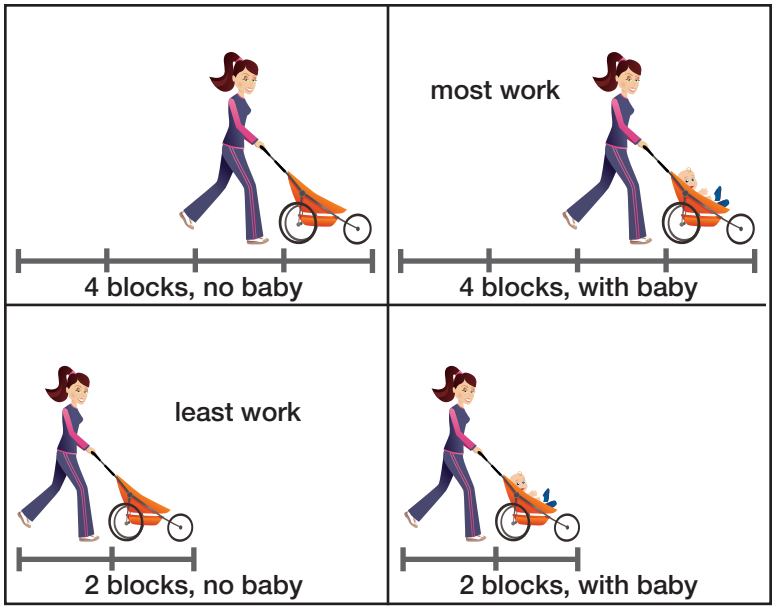
Force, Motion, and Work

In science, **work** happens when you move something. The amount of work you do depends on the distance the object moves and the force it takes to move it.

Do You Know?

Scientists measure work by multiplying the distance an object moves by the force used to move it.

FORCE x DISTANCE = WORK



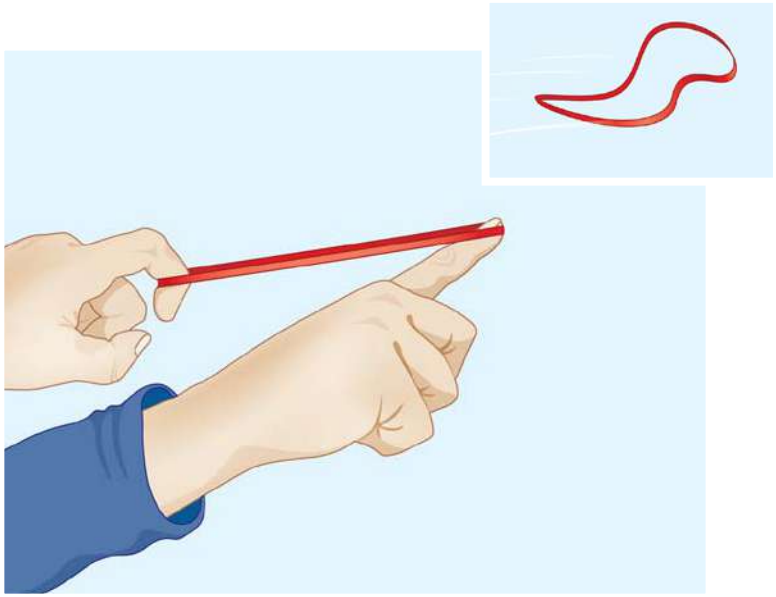
It takes less work to push an empty stroller than a stroller with a baby in it because an empty stroller has less mass. Also, pushing the stroller four city blocks requires twice as much work as pushing it only two blocks.

Energy

Energy is the ability to do work. The more energy you have, the more work you can do.

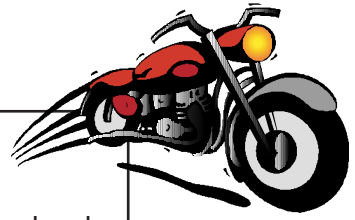
Potential and Kinetic Energy

Energy comes in two basic types: potential and kinetic. Take a rubber band, for example. When you pull it back, it has **potential energy**. This energy is stored and ready to use. The farther back you pull the rubber band, the more potential energy it has. When you let it go, the rubber band flies away. That potential energy changed into **kinetic energy**. Kinetic energy is energy in motion.



Can you guess which type of energy a tank full of gasoline contains? Fuels such as gasoline have potential energy. Burning gas to make a car move changes that potential energy into kinetic energy.

Think About It

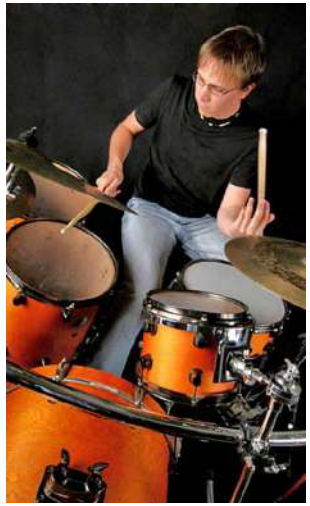


Why can't a motorcycle that is out of gas be ridden? Think about potential and kinetic energy.

The food you eat also has potential energy. Plants gather energy from the Sun. Animals get energy from eating plants and other animals. When you eat food, you store up energy. Then that energy makes your heart beat and makes your lungs expand and contract.

Energy Transfer

Energy can be changed, or *converted*, from one kind to another. Energy can also be moved, or *transferred*, from one object or place to another. Changing and moving energy is called **energy transfer**.



Solar energy becomes stored energy in plants. When you eat, the stored energy in plants can be transferred to your muscles and converted into motion in your arms. Then this motion can be transferred to moving drumsticks. The sticks can make a drum vibrate, creating sound energy.

The energy stored in batteries can make a toy move and make sounds. It can also be converted into light energy in a flashlight. What other examples of energy transfer can you think of?

Conclusion

You've learned that it takes force to make things move or stop and that forces affect the speed and direction of a moving object. You read about Isaac Newton's laws of motion. You learned that the mass of an object is related to the force that makes it move. Simple pushes and pulls as well as lifting are examples of force. Other types of force include gravity, friction, and magnetism. People, machines, and nature can all exert a force.

Work is done when a force moves an object over a distance. It takes energy to do work. This energy is either potential (stored) or kinetic (motion). Energy can transfer by moving or by changing from one type of energy to another. Forces and motion are everywhere, all around you.

Glossary

direction the way or course toward which something moves or faces (p. 4)

distance the amount of space between things (p. 13)

electromagnetism the combined force of electricity and magnetism (p. 19)

energy transfer the movement of energy from one object to another or the change of energy from one form to another (p. 23)

force the strength or energy that moves an object (p. 4)

friction a force that slows down moving things (p. 16)

gravity the force that pulls things toward the center of Earth or any other object that has mass (p. 7)

inertia the tendency of an object to resist change in the direction or speed of its motion (p. 9)

kinetic energy the energy that a moving body has because of its motion (p. 21)

magnetism a force that pushes and pulls certain metals (p. 18)

mass the amount of matter, measured on Earth by its weight (p. 10)

momentum the strength or force that keeps something moving (p. 11)

motion the act of going from one place to another; movement (p. 4)

potential energy the energy a body has because of its position, electrical charge, or structure; stored energy (p. 21)

speed the rate of movement (p. 4)

weight how heavy something is, determined by the pull of gravity on the object's mass (p. 14)

work the act of using force to move something over a certain distance (p. 20)

Index

Task 1: Forces and Motion Notebook Scavenger Hunt

Forces and Motion - Notebook Scavenger Hunt

Name:_____

Vocabulary Review - Write the definition for the following terms.

1.Force	
2.Net Force	
3.Newton's 1st Law	
4.Newton's 2nd Law	
5.Newton's 3rd Law	
6.Unbalanced Forces	
7.Balanced Forces	
8.Velocity	

9.List all the forms of friction and give an example of each form of friction:

_____ -

_____

_____ -

_____

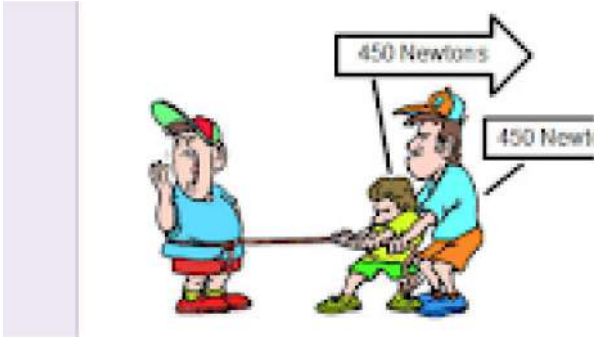
_____ -

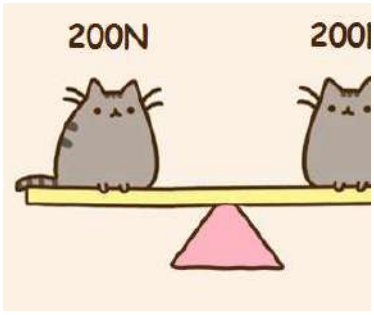
_____

_____ -

_____

10.Tell whether the objects in each picture are balanced or unbalanced. If the forces are not balanced how much net force would be required to make it balanced and on which side.





11.Name that law. Which of Newton's laws does the scenario describe?

A. **It takes more force to push a sumo wrestler than it does a child.** _____

B. **A cyclist hits a rock and flies forward until he hits the ground.** _____

C. **An ice skater pushes back with their foot and slides forward on the ice.** _____

12.What is the mathematical equation for newton's 2nd law?

_____

13.According to newton's second law, what amount of force would need to be added to an object with a mass of 10kg that accelerates at a rate of 2 meters per second?

_____

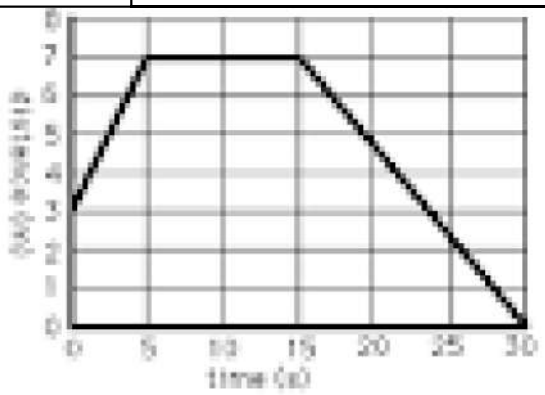
14.What is the formula for calculating speed?Write it out and draw the triangle. _____

15.Calculate the speed for an object traveling 100 meters in 10 seconds (show your work) _____

16.Draw the graph that matches the description.

Distance/Time Graph at Rest	
Distance/Time Graph at Constant Speed	
Distance/Time Graph Accelerating	
Distance/Time Graph Negative Acceleration	
Speed/Time Graph Constant Speed	
Speed/Time Graph Speeding Up	

Speed/Time Graph Slowing Down	

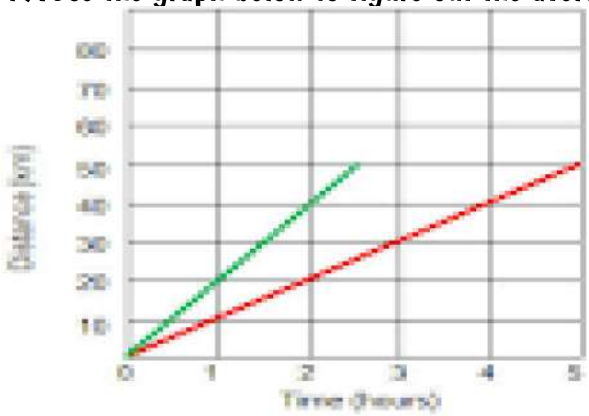


Use the graph to the right for questions 17-18.

17. Describe what is happening between 0-5 seconds on the graph.

18. Describe what is happening between 5-15 seconds on the graph.

19. Use the graph below to figure out the average speed of the slower object.



It's Dynamic! Laws of Motion and Speed

By Trista L. Pollard

[1] What do cars, airplanes, conveyor belts, and emails have in common? They all involve motion. Our daily lives are filled with objects and beings in **motion**. Each day we expect to see vehicles traveling on the streets and through the air; groceries moving toward cashiers in grocery stores; and emails making their journeys across the wires to their global destinations. As much as we may recognize that motion is an important part of our lives, do we really understand motion?

[2] Motion is the change of position of one body in relation to another body. **Dynamics** is the area of science that focuses on how objects move and the forces that change their motion. To fully understand the motion that is associated with vehicles and machines, you must also understand the scientific laws and principles of motion. It's easy to assume that bodies (beings and objects) are not always moving. However, when scientists analyze the motion of bodies, they do so in reference to other bodies. For example, if we talk about motion in relation to the earth, then all bodies on earth are only moving specific distances at specific points in time. However, if we analyze motion in relation to the sun, then all bodies on earth, including earth itself, are moving continuously. Therefore, our study of motion will focus on movement of bodies in relation to the earth.

[3] When bodies move, they travel specific distances in a straight line in specific amounts of time. The rate at which they travel depends on different factors. Those factors are **velocity**, **force**, and **energy**. Let's look at the scientific laws of motion and the principle of velocity. Scientist Sir Isaac Newton (1642-1727) was one of the first scientists to discover the relationship between **force** and motion. His discoveries helped him to develop three scientific laws of motion. **Newton's First Law of Motion** states that bodies at rest tend to remain at rest, and that bodies in motion tend to remain in motion. These bodies that are in motion move at a constant **speed** in a straight line. This is called **inertia**. The factor that can affect inertia is force. Force, which is the push or pull on an object, can change the motion of an object. Newton's Second Law of Motion involves acceleration and mass. It states that the **acceleration** of a body is directly proportional to the force applied to that body; and that the mass (weight) of that body is inversely proportional to acceleration. When you increase the force on an object, the object's motion accelerates or increases. If the mass of an object is increased, the motion of the object will **decelerate** or slow down. Of course if you decrease the object's mass, its motion will accelerate.

[4] **Newton's Third Law of Motion** is probably one of the most well known. It states that for every action there is an equal and opposite reaction. A good example of this law could occur during your first visit to an ice skating rink. As you hold on to the rink wall for

dear life, you try to balance on your new ice skates. You finally get up the nerve to push yourself away from the wall. You may not have noticed, but as you pushed towards the wall, your body on brand new ice skates moved in the opposite direction of the wall. The force you used to push against the wall is the same amount of force that is used to push you away from the wall to the middle of the ice. Now that we have the laws, let's talk about velocity.

5 **Velocity** is the **speed** of an object at a given duration. Speed is the change in the **displacement** or the distance of an object as it travels over a given time. Displacement, more specifically, refers to the length and direction of an object's path from its starting point to its ending point, hence its distance. We can look at velocity within an instant moment and over a span of time. **Instantaneous velocity** or **instantaneous speed** is the speed a body travels at a particular instant. Remember you on the ice skates? Well, the moment you pushed yourself away from the wall, your motion was instantaneous and could be measured in that short span of time. **Average velocity** or **average speed** is the total distance an object travels over the total time span it took to achieve that distance. Think about those long family vacations in the car during the summer. Let's say on this trip your parents drove 1,200 miles each way to Disney World in Orlando, Florida. If we know that it took them twenty hours to make the trip one way, we can figure out the average velocity for your car during this time. You would need to divide the total distance, one way (1,200 miles) by the total time span one way (twenty hours). The average velocity of your car during the first leg of this trip was sixty miles per hour. Velocity can also be measured metrically in kilometers per hour.

6 In Newton's second law we discussed acceleration and deceleration. Both are changes in the velocity of a body with respect to time. To accelerate the velocity of an object, force must be applied in the same direction as the velocity. This principle is demonstrated in cars. When your parent uses a foot to push on the accelerator, the force in addition to the car causes its velocity to increase. Likewise, when your parent decreases the amount of force on the accelerator, the car begins to decelerate, and therefore, its velocity decreases. Force can also be used to change the direction of an object's velocity if it is applied in right angles. You are playing kickball, and it is your turn at the plate. The pitcher rolls the ball straight towards you. When you kick the moving ball, it veers off to the right. You have just changed the direction of the ball's velocity.

7 As you can see, there is more to motion than just bodies and objects moving all over the place. In fact, there is a scientific field dedicated to it.

Name _____ Date _____

It's Dynamic! Laws of Motion and Speed

1. Dynamics is the science of _____. (A) How objects, motion, and force are unrelated (B) How objects remain stationary without force (C) How objects move and the forces that affect those objects (D) How objects disintegrate when force is applied	2. True or False? When you analyze the motion of objects and beings, you do so in relation to other objects and beings. (A) False (B) True
3. Velocity is _____. (A) The electrical measurement of an object over time (B) The floating of an object in water over time (C) The lack of speed of an object over time (D) The speed of an object during a given span of time	4. How is instantaneous velocity different from average velocity? _____ _____
5. Define acceleration and deceleration. _____ _____	6. Your older sister drove 500 miles to college one way in ten hours. What was her average velocity? _____ _____

Name _____ Date _____

It's Dynamic! Laws of Motion and Speed

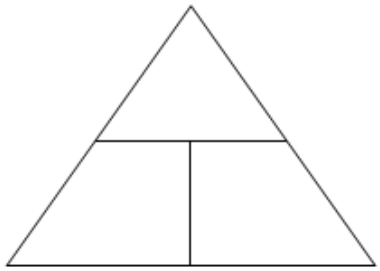
7. Your family decided to take a different route when they returned from Disney World in Orlando, Florida. This time they drove 1,500 miles. If they traveled sixty miles per hour, how long was the return trip? _____ _____	8. Sir Isaac Newton's Third Law of Motion explains the scientific principle of inertia. (A) False (B) True

Name: _____ Per.: ____ Date: _____

Speed, Distance and Time Practice

Directions: Use your study guides and notes to help you. Make sure you use pencil and show your work!

Magic triangle:



Equations:

Speed =

Distance =

Time =

Practice with Distance-Time-Speed Problems

Steps for completing:

1. Read the question once.
2. See what the question asks you to find (the unknown variable).
3. Find the value of the known quantities.
4. Read the question again and make sure you have the correct value for each. (These questions can be tricky!)
5. Set up the equation. MAKE SURE YOU INCLUDE THE UNITS!!!!
6. Solve for the unknown variable.
7. PLACE YOUR ANSWER ON THE LINE!

Snails crawl very slowly. If a garden snail crawls at 0.013 m/s north, how far will it travel in 60 seconds?

s = _____ d = _____ t = _____

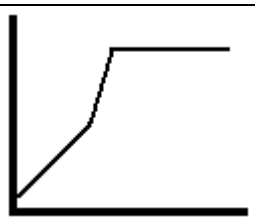
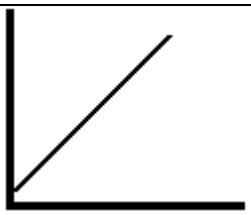
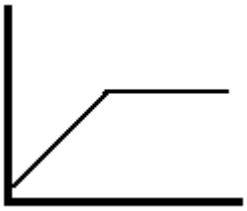
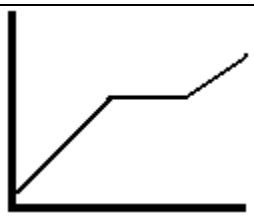
A greyhound dog can run with a top speed of 17.6 m/s. At this rate, how long will it take to run 100 meters?

s = _____ d = _____ t = _____

Graphing

Reading Distance-Time Graphs

The distance –time graphs below represent the motion of a car. Match the descriptions with the graphs. Explain your answers.

			
A	B	C	D

Descriptions:

1. The car drove at a constant speed and stopped.
2. The car is traveling at constant speed.
3. The car drove at a constant speed, then stopped, then drove at a constant speed again.
4. The car increased its speed and then stopped.

Graph A matches description _____ because _____

_____

_____.

Graph B matches description _____ because _____

_____

_____.

Graph C matches description _____ because _____

_____

_____.

Graph D matches description _____ because _____

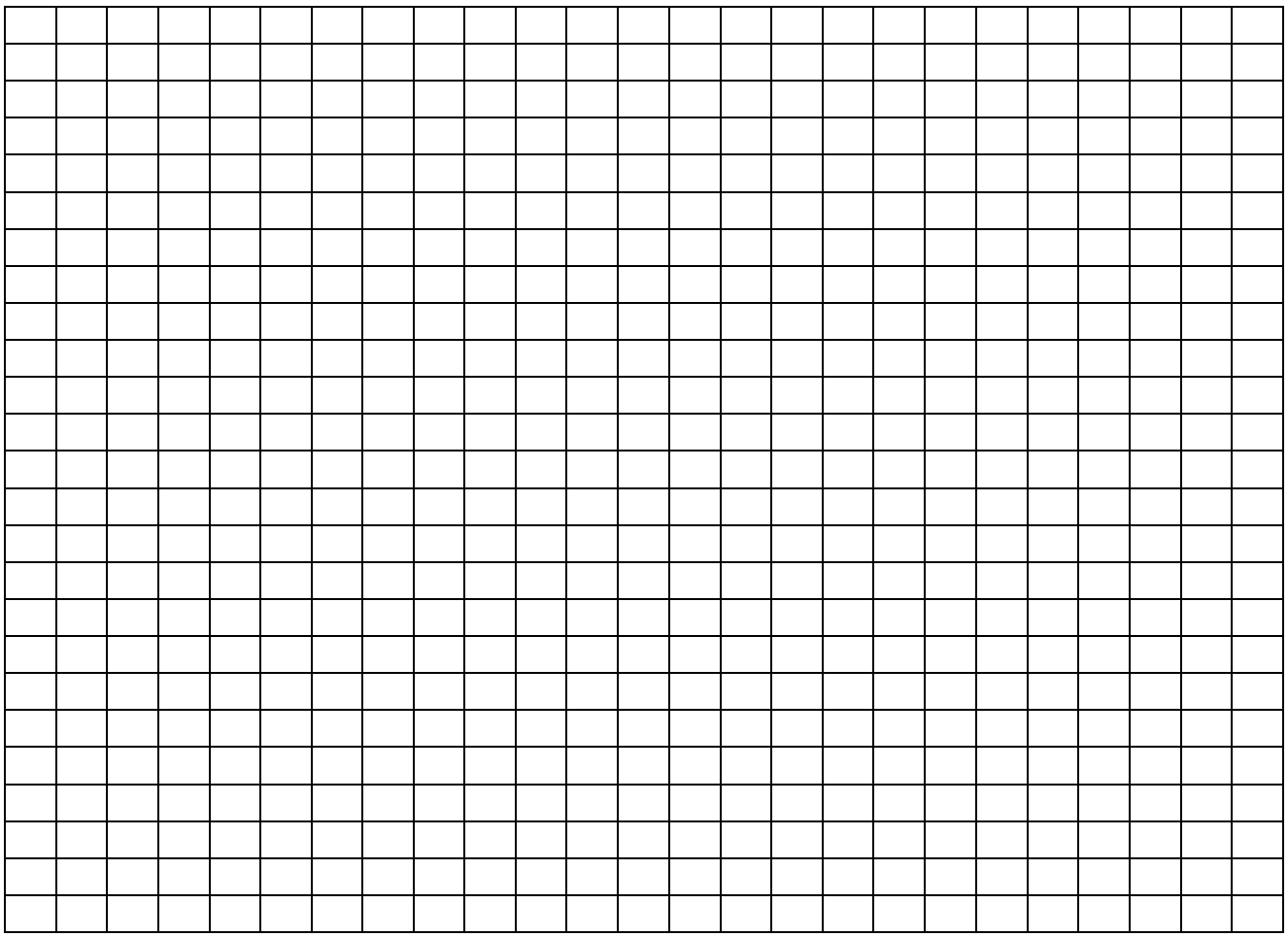
_____

_____.

Creating a Distance-Time Graph

Sam drove his delivery truck of Ben and Jerry's ice-cream on a delivery route. He recorded the time and distance for each part of the trip. Use the data to create a distance-time graph, and then answer the questions below the graph. Remember to include labels and units.

Time (h)	0	1	2	3	4	5	6
Distance (km)	0	5	8	10	10	16	24



1. During what time period was Sam driving the slowest? _____
2. During what time period was Sam driving the fastest? _____
3. During what time period was Sam stopped? _____
4. What was Sam's average speed between 0 and 6 hours? Show your work!

Speed and Velocity Practice Problems

Directions: Complete these problems. Show your work, including formulas and units of measure.

1. If a cross country runner covers a distance of 287 meters in 154 seconds what is her speed?

2. What is the speed of a baseball that travels 49 meters in 2.4 seconds?

3. Which has a greater speed, a ball rolling down a 3.4 meter hill in 6 seconds or a fish swimming upstream and covering 5.4 meters in 24 seconds?

4. How long does a horse take to run a distance of 6 miles at 16 miles/hour?

5. If the Bailey Park trail is a bit more than 300 meters long and you walk at a pace of 1.3 m/s, how long will it take you to walk across the green?

6. If the stink bug in our classroom can move at a speed of 0.04 m/s, how long will it take for the bug to move 5 meter?

TEST NAME: **Grade 7 Science Forces and Motion Unit Test**
TEST ID: **3274928**
GRADE: **07 - Seventh Grade**
SUBJECT: **Life and Physical Sciences**
TEST CATEGORY: **District Benchmark**

Student: _____

Class: _____

Date: _____

1. A ball rolled from point *X* to point *Y* in 5 seconds, then from point *Y* to point *Z* in 3 seconds. Which ***best*** describes the speed of the ball as it rolled along its path?

   A. The speed increased.

   B. The speed decreased.

   C. The speed remained constant.

   D. It was not possible to analyze the ball's speed.

2. A student drives 50 miles north from the starting line of a race, then drives 60 miles going south. Which ***best*** describes the student's displacement from the starting line?

   A. 10 miles south

   B. 10 miles north

   C. 110 miles south

   D. 110 miles north

3. Which forces ***most likely*** act on a paper airplane when it is thrown into the air?

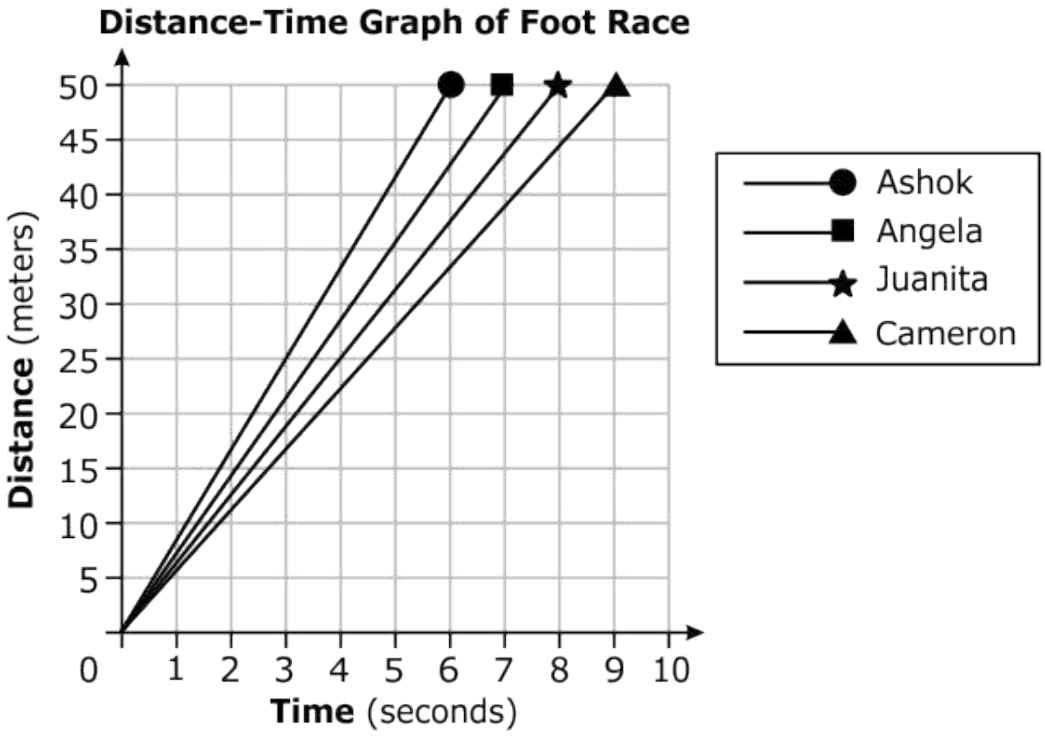
   A. friction and gravity

   B. gravity and magnetism

   C. magnetism and friction

   D. friction, gravity, and magnetism

4. The graph below represents a distance-time graph of a 50-meter race.



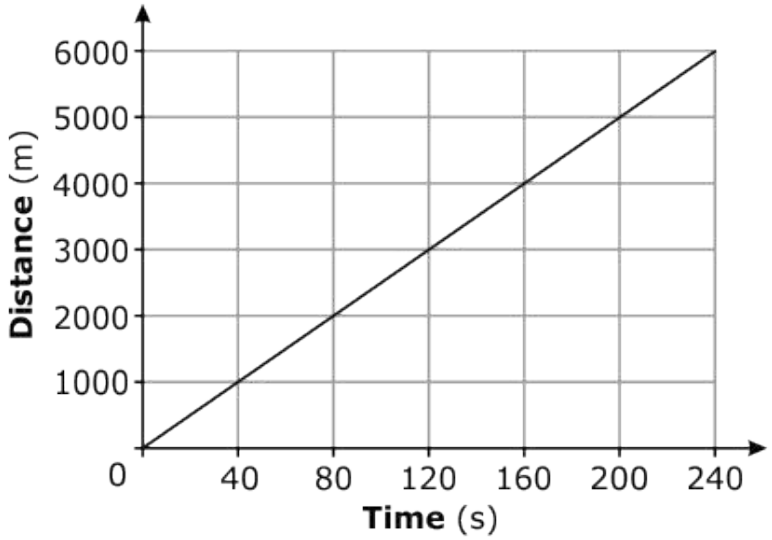
A. 1 second

B. 2 seconds

C. 3 seconds

D. 4 seconds

5. The graph below shows a car moving at a constant speed.



A. the distance the car traveled

B. the time it took the car to travel the distance

C. the distance the car traveled, the amount of air resistance, and friction

D. the distance the car traveled, and the time it took to travel that distance

6. Which ***best*** demonstrates an object at rest stays at rest unless a force acts upon it, or Newton's first law of motion?

A. A car is rolling quickly down a hill.

B. A ball is stationary until a boy kicks it.

C. A balloon with no air lies on the ground.

D. A student pushes a large object with the same force as a small object.

7. Which ***best*** demonstrates balanced forces on an object?

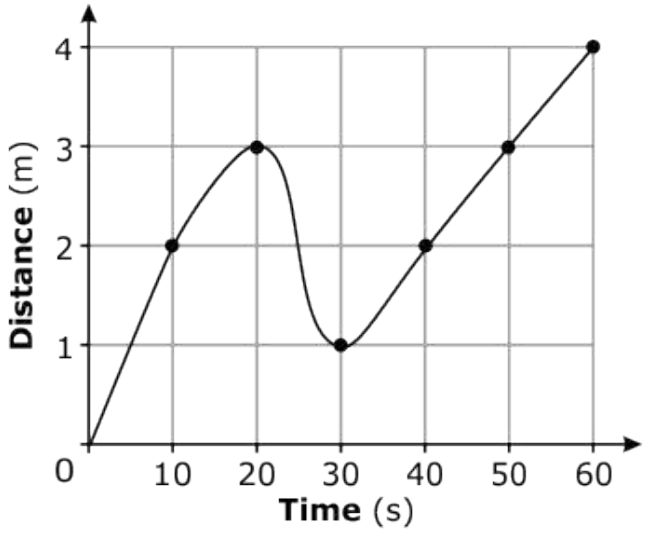
A. A tennis ball rolls down a hill.

B. A bowling ball sits motionless.

C. A windmill spins during a light breeze.

D. A car slides across the ice when brakes are applied.

8. The graph below shows the position of an object over time.



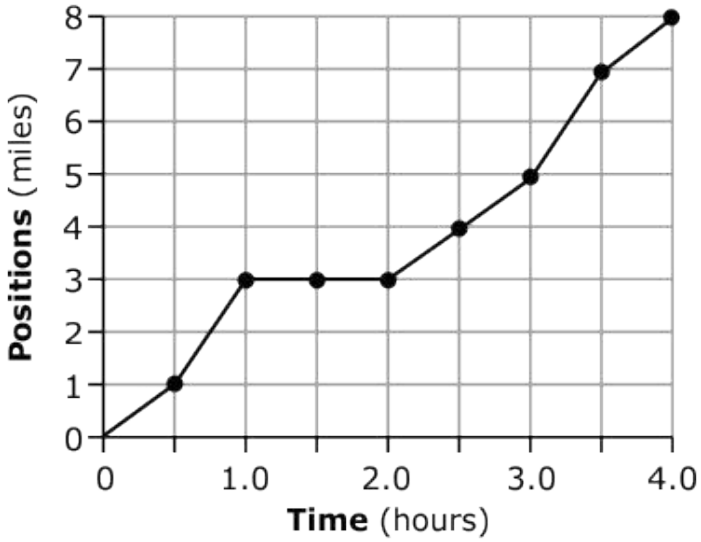
A. 0s and 30s

B. 10s and 40s

C. 20s and 60s

D. 30s and 60s

9. The graph below shows the distance a person ran over a 4-hour period.



When did the person sit down?

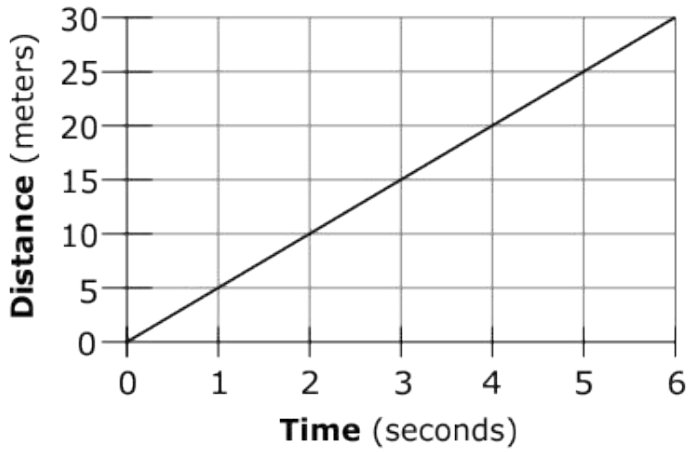
A. 1.0- 2.0 hr

B. 1.5–4.0 hr

C. 2.5–3.0 hr

D. 3.5–4.0 hr

10. The graph below shows the movement of Emily's fastball.



A. 5 meters

B. 15 meters

C. 25 meters

D. 35 meters

11. A book is at rest on a desk and it remains at rest. Which ***best*** explains the forces upon the book?

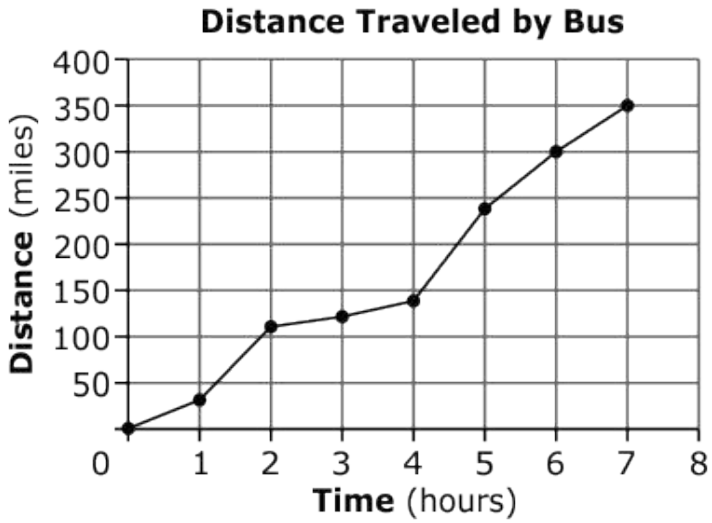
A. Only velocity is acting on the book.

B. Only friction is acting on the book.

C. The forces acting on the book are balanced.

D. The forces acting on the book are unbalanced.

12. The graph below shows the distance a bus traveled over seven hours.



When is the bus traveling the fastest?

A. between hours 0 and 1

B. between hours 4 and 5

C. between hours 5 and 6

D. between hours 6 and 7

13. Which ***best*** describes the change in position of an object's location compared to a reference point?

A. acceleration

B. motion

C. speed

D. vector

14. The table below shows the distance a swimmer swam in 30 minutes on 3 different days.

Days	**Distance** (m)	**Time** (min)
Day 1	1300	30
Day 2	2400	30
Day 3	1800	30

Which ***best*** describes the difference between the average speed of Day 2 and Day 3?

A. 20 m/min

B. 40 m/min

C. 60 m/min

D. 80 m/min

15. Which ***best*** describes a force that opposes motion between two surfaces that are in contact?

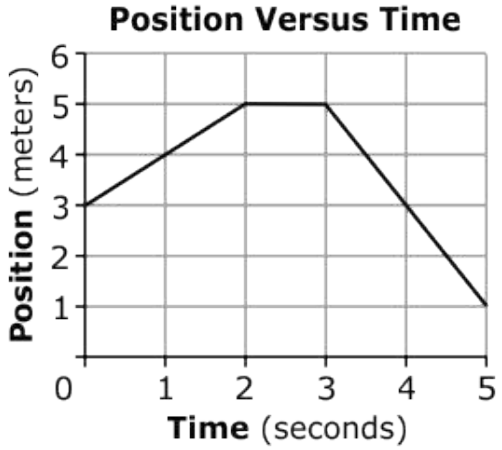
A. friction

B. gravity

C. speed

D. velocity

16. The graph below shows the position versus time of a roller coaster.



What happens at 2-3 seconds?

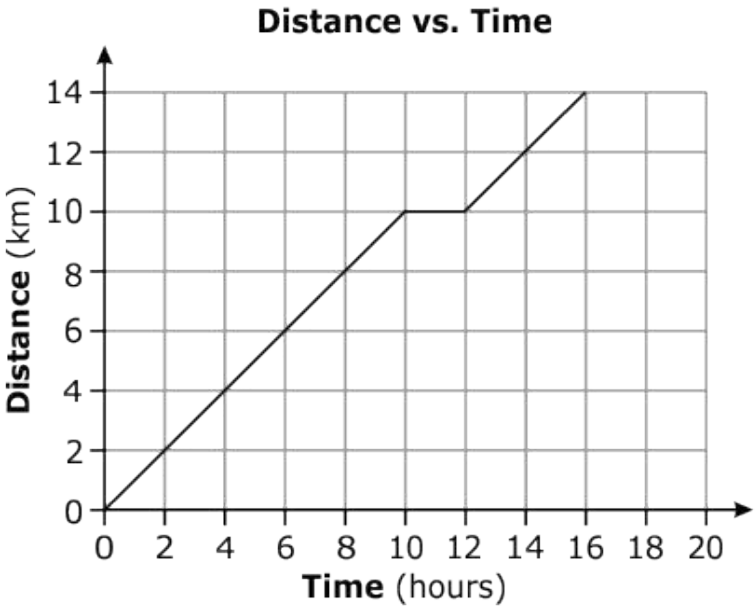
A. The roller coaster is nearing a turn.

B. The roller coaster is moving up a hill.

C. The roller coaster is moving down a hill.

D. The roller coaster is sitting on top of a hill.

17. The graph below represents the motion of a vehicle over time.



How can you find the average speed of the object?

A. 14 meters divided by 16 hours

B. 16 hours divided by 14 meters

C. 14 kilometers divided by 16 hours

D. 16 hours divided by 14 kilometers

18. Which ***best*** describes an object in motion?

A. an object whose mass has changed

B. an object whose color has changed

C. an object that has absorbed light energy

D. an object that has changed position over time

19. If Jeff is walking 2 miles per hour (mph), how far can he travel in 1 hour?

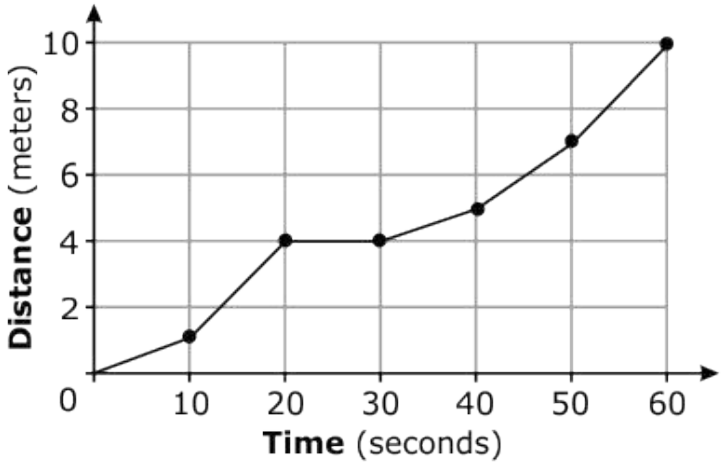
A. 2 miles

B. 3 miles

C. 4 miles

D. 5 miles

20. The graph below represents the distance over time for a toy car moving on a straight track.



A. 0–10 seconds

B. 10–20 seconds

C. 20–30 seconds

D. 30–40 seconds

Grade 7 Science Forces and Motion Unit Test [3274928]
SUBJECT: **Life and Physical Sciences**
ADMINISTRATION DATES: **10/2/2019 - 10/18/2019**
PREFERRED STANDARDS DOCUMENT: ***Science**
GRADE LEVEL: **07 - Seventh Grade**
NUMBER OF QUESTIONS: **20**

Item #	Correct Answer	Standard ID	Point Value	Type
1	A	NCES.7.P.1.1	1	Multiple Choice
2	A	NCES.7.P.1.1	1	Multiple Choice
3	A	NCES.7.P.1.2	1	Multiple Choice
4	C	NCES.7.P.1.4	1	Multiple Choice
5	D	NCES.7.P.1.4	1	Multiple Choice
6	B	NCES.7.P.1.2	1	Multiple Choice
7	B	NCES.7.P.1.2	1	Multiple Choice
8	B	NCES.7.P.1.3	1	Multiple Choice
9	A	NCES.7.P.1.3	1	Multiple Choice
10	C	NCES.7.P.1.4	1	Multiple Choice
11	C	NCES.7.P.1.2	1	Multiple Choice
12	B	NCES.7.P.1.3	1	Multiple Choice
13	B	NCES.7.P.1.1	1	Multiple Choice
14	A	NCES.7.P.1.4	1	Multiple Choice
15	A	NCES.7.P.1.2	1	Multiple Choice
16	D	NCES.7.P.1.3	1	Multiple Choice
17	C	NCES.7.P.1.3	1	Multiple Choice
18	D	NCES.7.P.1.1	1	Multiple Choice
19	A	NCES.7.P.1.1	1	Multiple Choice
20	C	NCES.7.P.1.4	1	Multiple Choice