LOWELL PUBLIC SCHOOLS

At Home Learning Resources

Grade 8 - Week 12

https://2020census.gov/

Grade 8 ELA Week 12

All previous activities, as well as other resources can be found on the Lowell Public Schools website: https://www.lowell.k12.ma.us/Page/3804

This week completes a focus on science fiction reading and writing. Your child should be reading, writing, talking and writing about reading, and learning new vocabulary.

Reading: Students need to read each day. They can read the science fiction text included in this packet and/or read any of the science fiction/dystopian books that they have at home, or can access online at Epic Books, Tumblebooks, the Pollard Library online, or other online books. All resources are on the LPS website. There is something for everyone.

Talking and Writing about Reading: As students are reading, they can think about their reading and get ready for summer. Students can also reflect back on the school year and write a bit about what they liked or learned.

Writing: Students will finish working on writing science fiction stories this week. These resources are charts with examples to help your child write. They are available online in an interactive form with video tutorials here: Grade 8 Science Fiction Writing Choice Board. This writing should finish this week. Students will be writing, then making it even better by revising, writing some more, and at the end, fixing it up by editing.

Word Work: Students can work on learning new vocabulary in their reading.

My Summer Reading Plan

Books/Authors I want to read:

_____

_____

_____

_____

_____

Where I will get books:

- ☐ Borrow from the library
- ☐ Buy at a bookstore
- ☐ Read online
- ☐ Buy Online
- ☐ Trade books with friends
- ☐ Other _____

Where I will read:

- ☐ In my bedroom
- ☐ In my car
- ☐ In the living room
- ☐ At the beach
- ☐ Outside
- ☐ Other _____

Log all of the books that you read. If you read 1 book, write it down. If you read 100, write them down. You can write them here. If you run out of room, add another piece of paper.

OR

Looking for an even easier way to log your books, do it online. Click here to enter your book titles online. Your school will keep a list of all of the books that you read.

Remember, you only need to log your books on paper **or** online. NOT BOTH!

Happy Summer Reading!

"August 2026: There Will Come Soft Rains"
(1950)
Ray Bradbury

In the living room the voice-clock sang, *Tick-tock, seven o'clock, time to get up, time to get up, seven o'clock!* as if it were afraid that nobody would. The morning house lay empty. The clock ticked on, repeating and repeating its sounds into the emptiness. *Seven-nine, breakfast time, seven-nine!*

In the kitchen the breakfast stove gave a hissing sigh and ejected from its warm interior eight pieces of perfectly browned toast, eight eggs sunnyside up, sixteen slices of bacon, two coffees, and two cool glasses of milk.

"Today is August 4, 2026," said a second voice from the kitchen ceiling, "in the city of Allendale, California." It repeated the date three times for memory's sake. "Today is Mr. Featherstone's birthday. Today is the anniversary of Tilita's marriage. Insurance is payable, as are the water, gas, and light bills."

Somewhere in the walls, relays clicked, memory tapes glided under electric eyes.

Eight-one, tick-tock, eight-one o'clock, off to school, off to work, run, run, eight-one! But no doors slammed, no carpets took the soft tread of rubber heels. It was raining outside. The weather box on the front door sang quietly: "Rain, rain, go away; rubbers, raincoats for today…" And the rain tapped on the empty house, echoing.

Outside, the garage chimed and lifted its door to reveal the waiting car. After a long wait the door swung down again.

At eight-thirty the eggs were shriveled and the toast was like stone. An aluminum wedge scraped them into the sink, where hot water whirled them down a metal throat which digested and flushed them away to the distant sea. The dirty dishes were dropped into a hot washer and emerged twinkling dry.

Nine-fifteen, sang the clock, *time to clean.*

Out of warrens in the wall, tiny robot mice darted. The rooms were acrawl with the small cleaning animals, all rubber and metal. They thudded against chairs, whirling their mustached runners,

kneading the rug nap, sucking gently at hidden dust. Then, like mysterious invaders, they popped into their burrows. Their pink electric eyes faded. The house was clean.

Ten o'clock. The sun came out from behind the rain. The house stood alone in a city of rubble and ashes. This was the one house left standing. At night the ruined city gave off a radioactive glow which could be seen for miles.

Ten-fifteen. The garden sprinklers whirled up in golden founts, filling the soft morning air with scatterings of brightness. The water pelted windowpanes, running down the charred west side where the house had been burned evenly free of its white paint. The entire west face of the house was black, save for five places. Here the silhouette in paint of a man mowing a lawn. Here, as in a photograph, a woman bent to pick flowers. Still farther over, their images burned on wood in one titanic instant, a small boy, hands flung into the air; higher up, the image of a thrown ball, and opposite him a girl, hands raised to catch a ball which never came down.

The five spots of paint—the man, the woman, the children, the ball—remained. The rest was a thin charcoaled layer.

The gentle sprinkler rain filled the garden with falling light.

Until this day, how well the house had kept its peace. How carefully it had inquired, "Who goes there? What's the password?" and, getting no answer from lonely foxes and whining cats, it had shut up its windows and drawn shades in an old maidenly preoccupation with self-protection which bordered on a mechanical paranoia.

It quivered at each sound, the house did. If a sparrow brushed a window, the shade snapped up. The bird, startled, flew off! No, not even a bird must touch the house!

The house was an altar with ten thousand attendants, big, small, servicing, attending, in choirs. But the gods had gone away, and the ritual of the religion continued senselessly, uselessly.

Twelve noon.

A dog whined, shivering, on the front porch.

The front door recognized the dog voice and opened. The dog, once huge and fleshy, but now gone to bone and covered with sores, moved in and through the house, tracking mud. Behind it whirred angry mice, angry at having to pick up mud, angry at inconvenience.

For not a leaf fragment blew under the door but what the wall panels flipped open and the copper scrap rats flashed swiftly out. The offending dust, hair, or paper, seized in miniature steel jaws, was raced back to the burrows. There, down tubes which fed into the cellar, it was dropped into the sighing vent of an incinerator which sat like evil Baal in a dark corner.

The dog ran upstairs, hysterically yelping to each door, at last realizing, as the house realized, that only silence was here.

It sniffed the air and scratched the kitchen door. Behind the door, the stove was making pancakes which filled the house with a rich baked odor and the scent of maple syrup.

The dog frothed at the mouth, lying at the door, sniffing, its eyes turned to fire. It ran wildly in circles, biting at its tail, spun in a frenzy, and died. It lay in the parlor for an hour.

Two o'clock, sang a voice.

Delicately sensing decay at last, the regiments of mice hummed out as softly as blown gray leaves in an electrical wind.

Two-fifteen.

The dog was gone.

In the cellar, the incinerator glowed suddenly and a whirl of sparks leaped up the chimney.

Two thirty-five.

Bridge tables sprouted from patio walls. Playing cards fluttered onto pads in a shower of pips. Martinis manifested on an oaken bench with egg-salad sandwiches. Music played.

But the tables were silent and the cards untouched.

At four o'clock the tables folded like great butterflies back through the paneled walls.

Four-thirty.

The nursery walls glowed.

Animals took shape: yellow giraffes, blue lions, pink antelopes, lilac panthers cavorting in crystal substance. The walls were glass. They looked out upon color and fantasy. Hidden films docked through well-oiled sprockets, and the walls lived. The nursery floor was woven to resemble a crisp, cereal meadow. Over this ran aluminum roaches and iron crickets, and in the hot still air butterflies of delicate red tissue wavered among the sharp aroma of animal spoors! There was the sound like a great matted yellow hive of bees within a dark bellows, the lazy bumble of a purring lion. And there was the patter of okapi feet and the murmur of a fresh jungle rain, like other hoofs, falling upon the summer-starched grass. Now the walls dissolved into distances of parched weed, mile on mile, and warm endless sky. The animals drew away into thorn brakes and water holes.

It was the children's hour.

Five o'clock. The bath filled with clear hot water.

Six, seven, eight o'clock. The dinner dishes manipulated like magic tricks, and in the study a click. In the metal stand opposite the hearth where a fire now blazed up warmly, a cigar popped out, half an inch of soft gray ash on it, smoking, waiting.

Nine o'clock. The beds warmed their hidden circuits, for nights were cool here.

Nine-five. A voice spoke from the study ceiling:

"Mrs. McClellan, which poem would you like this evening?"

The house was silent.

The voice said at last, "Since you express no preference, I shall select a poem at random."

Quiet music rose to back the voice. "Sara Teasdale. As I recall, your favorite….

"There will come soft rains and the smell of the ground,

And swallows circling with their shimmering sound;

And frogs in the pools singing at night,

And wild plum trees in tremulous white;

Robins will wear their feathery fire,

Whistling their whims on a low fence-wire;

And not one will know of the war, not one

Will care at last when it is done.

Not one would mind, neither bird nor tree,

if mankind perished utterly;

And Spring herself, when she woke at dawn

Would scarcely know that we were gone."

The fire burned on the stone hearth and the cigar fell away into a mound of quiet ash on its tray. The empty chairs faced each other between the silent walls, and the music played.

At ten o'clock the house began to die.

The wind blew. A failing tree bough crashed through the kitchen window. Cleaning solvent, bottled, shattered over the stove. The room was ablaze in an instant!

"Fire!" screamed a voice. The house lights flashed, water pumps shot water from the ceilings. But the solvent spread on the linoleum, licking, eating, under the kitchen door, while the voices took it up in chorus: "Fire, fire, fire!"

The house tried to save itself. Doors sprang tightly shut, but the windows were broken by the heat and the wind blew and sucked upon the fire.

The house gave ground as the fire in ten billion angry sparks moved with flaming ease from room to room and then up the stairs. While scurrying water rats squeaked from the walls, pistoled their water, and ran for more. And the wall sprays let down showers of mechanical rain.

But too late. Somewhere, sighing, a pump shrugged to a stop. The quenching rain ceased.

The reserve water supply which had filled baths and washed dishes for many quiet days was gone.

The fire crackled up the stairs. It fed upon Picassos and Matisses in the upper halls, like delicacies, baking off the oily flesh, tenderly crisping the canvases into black shavings.

Now the fire lay in beds, stood in windows, changed the colors of drapes!

And then, reinforcements.

From attic trapdoors, blind robot faces peered down with faucet mouths gushing green chemical.

The fire backed off, as even an elephant must at the sight of a dead snake. Now there were twenty snakes whipping over the floor, killing the fire with a clear cold venom of green froth.

But the fire was clever. It had sent flames outside the house, up through the attic to the pumps there. An explosion! The attic brain which directed the pumps was shattered into bronze shrapnel on the beams.

The fire rushed back into every closet and felt of the clothes hung there.

The house shuddered, oak bone on bone, its bared skeleton cringing from the heat, its wire, its nerves revealed as if a surgeon had torn the skin off to let the red veins and capillaries quiver in the scalded air. Help, help! Fire! Run, run! Heat snapped mirrors like the brittle winter ice. And the voices wailed Fire, fire, run, run, like a tragic nursery rhyme, a dozen voices, high, low, like children dying in a forest, alone, alone. And the voices fading as the wires popped their sheathings like hot chestnuts. One, two, three, four, five voices died.

In the nursery the jungle burned. Blue lions roared, purple giraffes bounded off. The panthers ran in circles, changing color, and ten million animals, running before the fire, vanished off toward a distant steaming river....

Ten more voices died. In the last instant under the fire avalanche, other choruses, oblivious, could be heard announcing the time, playing music, cutting the lawn by remote-control mower, or setting an umbrella frantically out and in the slamming and opening front door, a thousand things happening, like a clock shop when each clock strikes the hour insanely before or after the other, a scene of maniac confusion, yet unity; singing, screaming, a few last cleaning mice darting bravely out to carry the horrid ashes away! And one voice, with sublime disregard for the situation, read poetry aloud in the fiery study, until all the film spools burned, until all the wires withered and the circuits cracked.

The fire burst the house and let it slam flat down, puffing out skirts of spark and smoke.

In the kitchen, an instant before the rain of fire and timber, the stove could be seen making breakfasts at a psychopathic rate, ten dozen eggs, six loaves of toast, twenty dozen bacon strips, which, eaten by fire, started the stove working again, hysterically hissing!

The crash. The attic smashing into kitchen and parlor. The parlor into cellar, cellar into sub-cellar. Deep freeze, armchair, film tapes, circuits, beds, and all like skeletons thrown in a cluttered mound deep under.

Smoke and silence. A great quantity of smoke.

Dawn showed faintly in the east. Among the ruins, one wall stood alone. Within the wall, a last voice said, over and over again and again, even as the sun rose to shine upon the heaped rubble and steam:

"Today is August 5, 2026, today is August 5, 2026, today is…"

There Will Come Soft Rains

By: Sara Teasdale

There will come soft rains and the smell of the ground,
And swallows circling with their shimmering sound;

And frogs in the pools singing at night,
And wild plum trees in tremulous white,

Robins will wear their feathery fire
Whistling their whims on a low fence-wire;

And not one will know of the war, not one
Will care at last when it is done.

Not one would mind, neither bird nor tree
If mankind perished utterly;

And Spring herself, when she woke at dawn,
Would scarcely know that we were gone.

If you could go back in time and restart the school year, what would you do differently and why?

1

What were your favorite parts of this school year?

2

What were your least favorite parts of this school year?

3

What one word would describe this school year? Explain why you chose the word.

4

What will you miss most about your classmates?

5

What will you miss most about your teacher?

6

What will you miss most about your classroom/school?

7

What was your favorite non-academic activity or event from this school year?

8

What was your favorite academic activity or event from this school year?

9

What was the best day you had this year? What made it the best?

10

What was the most interesting skill or topic you learned this year?

11

What was the most difficult skill or topic you learned this year?

12

What was something that was difficult for you at first but is now easy?

13

What was the easiest skill or topic you learned this year?

14

What do you wish that you had studied or learned this year?

15

What do you think was the most important things you learned this school year?

16

What did you accomplish this year that you are most proud of?

17

What was the kindest gesture you did for someone this year?

18

What was the kindest gesture someone did for you this year?

19

Which area of the classroom was your favorite? Why?

20

Which area of the school was your favorite? Why?

21

What will you miss most about this school year?

22

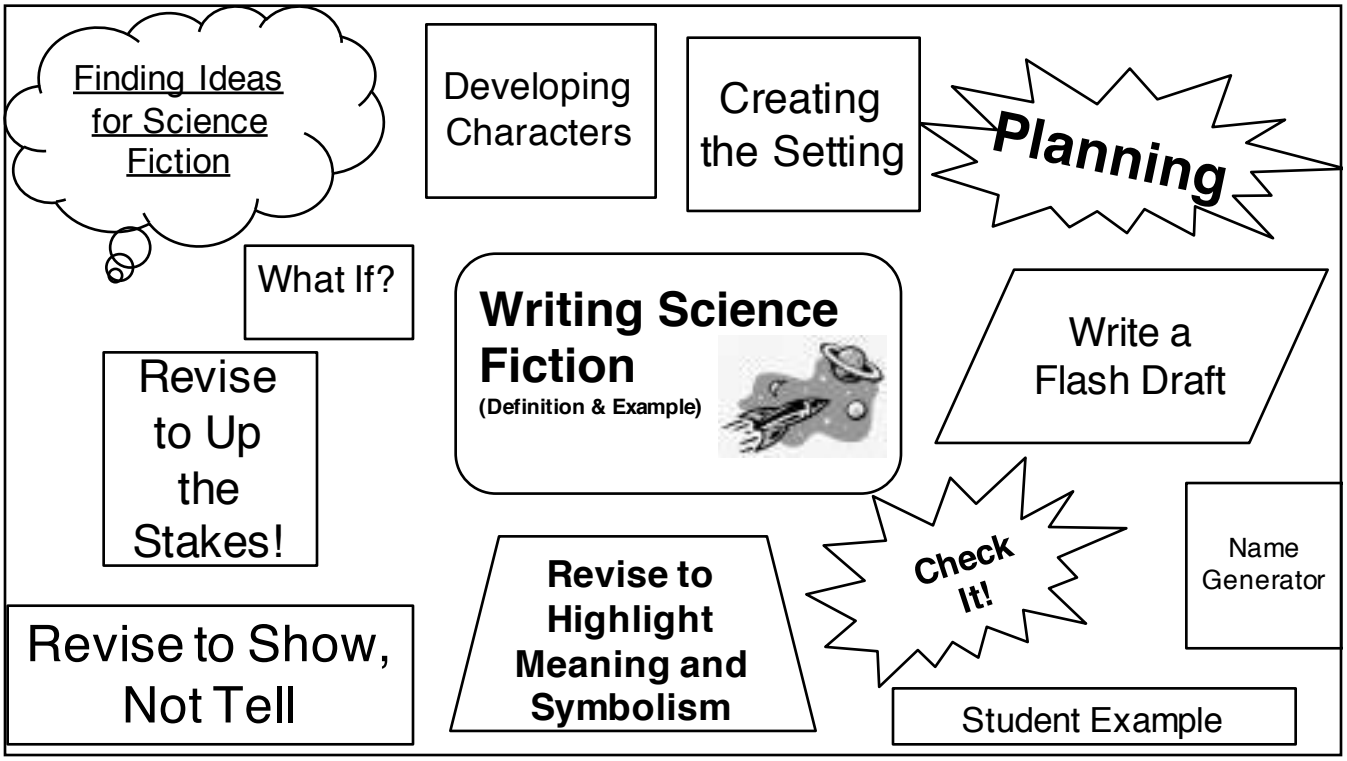
What was your favorite part of a normal school day? Why?

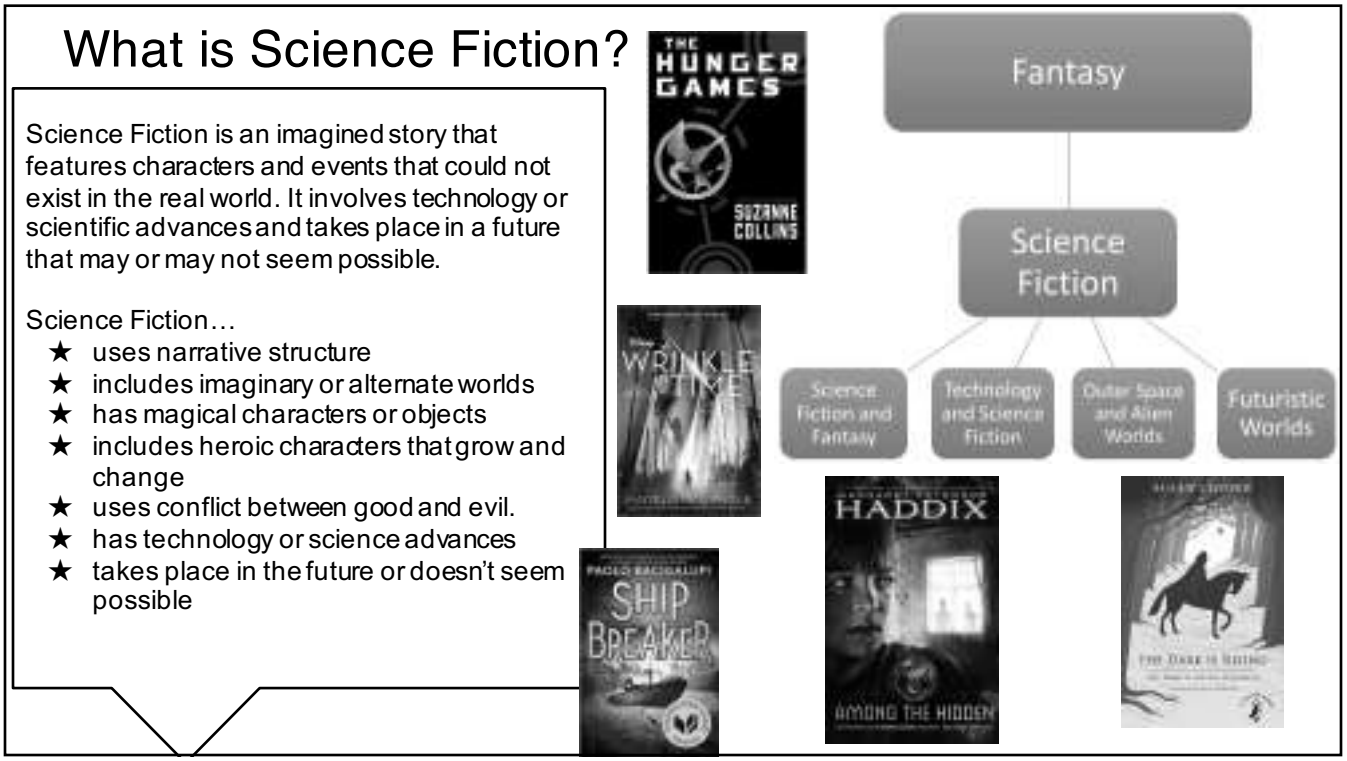
23

What was your favorite book you read in school this year?

24

Grade 8 Science Fiction Writing Choice Board - Visit the online option for an interactive board with tutorials. Use the anchor charts to help you write your own science fiction story.





Finding Ideas for Science Fiction...Science Fiction Writers:

Ask "What If?" about the world they live in to generate story ideas. Read the poem by Jackie French Koller and jot your thinking about IF these events had never happened to help you develop your ideas. What If?

Find Inspiration in Real Life

- Pay attention to the small moments in your life that could be fictionalized.
- Consider places where stories could take place, and then imagine those stories.
- Read about current events in newspapers, blogs, magazines, etc. Allow yourself to be inspired by true events that could be fictionalized.
- Ask, "What stories do I wish existed in the world?" Let this question lead you to invent a character with traits, struggles, actions.
- Think about an issue that is important to you, and create a character who struggles with that issue.

Think about setting: Gather ideas for a potential setting for your science fiction story and let that be the starting point for your story.

Earth, outer space, another dimension...

main character

You want to make sure you create a main character that sticks in your reader's mind.

- ★ What does your character look like? What are their facial features? Their voice?
- ★ What is special about your character? For example:
  - How do they walk?
  - How do they talk?
  - Who are their friends?
  - What does your character want?
- ★ What kinds of internal thoughts is your character having? For example, is there a problem your character is dealing with?

The robot was magnificent. Its frame was mostly heavy cardboard that had been painted silver. A sparkling pot sat atop the body, bolts welded into place for eyes and teeth.

Tin can hands dangled from lengths of rope wrapped in duct tape, which served as arms. The robot's legs and feet were sledgehammers standing on end.

A multitude of colored light bulbs were affixed to every surface that was vaguely straight and sturdy enough to hold them. An enormous boat wheel protruded from the back, its spokes ringing futuristic-sounding bells as it spun.

Setting

You decide when your story takes place. You can create a setting in your own world, one that is built on portals in another world, or based entirely in outer space. Anywhere!

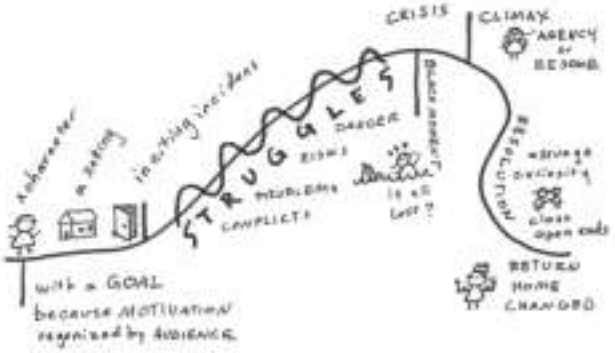
- ★ Is your setting similar to your real world?
- ★ Did you create a setting in another world or in outer space?
- ★ Did you create objects and scenery from another world?
- ★ Does your story take place in the present or in the future?
- ★ How is your setting important to what your characters say and do and the way they act?

Somebody asked me if I'd heard that there were immortal people on the Yendian Plane, and somebody else told me that there were, so when I got there, I asked about them. The travel agent rather reluctantly showed me a place called the Island of the Immortals on her map. "You don't want to go there," she said.

I

Plan

Revisit your ideas about setting and main character. Ask yourself: Do you think you can grow it into a full science fiction story? If so, create a plan for your story.



Be sure to include scientific facts or data as you create your plan. What problems will the characters face?

Flash Draft

Bring your story to life!

- ★ Block everything out and begin to "**flash draft**" your story.
- ★ Enter the world which you have already created: the **characters**, **setting**, and **use your plot plan**.
- ★ Write **fast and furious**, using all the **important details** you have worked on.
- ★ Be sure to include a conflict including the rising actions & resolution.

A government decree.

That's all it took for all mankind to come crashing down.

I remember my grandfather telling me how his great-great-grandfather had seen it all happen. Passed down through seven generations, it became the story of our family. The story of our end. Grandpa recalled it word by word.

He had said, "I remember it like yesterday, yes I do. It was broadcast on live television, and the whole internet was overridden by it. The little TVs inside of cars, SmartBoards in classrooms, I heard even New York's Times Square was bugged by this broadcast.

"The Expiration Act, it was called. The old man president was standing with all the other world leaders. All nice and organized, fake smiles and all. Not a single bit of remorse was shown by any of them, I'm telling you.

"They said something like, 'Starting on April 23, 2049, every human who is above 18 years of age shall be issued an expiration date. It has been decided these dates will be carved by specialists into the individual's skin, as that is the only way to ensure the date is not lost. This may seem quite frightening, but we can rest assured knowing that this is the way to maintain the world's growing population.'

"But I'm very sure, positive with no doubt in my old mind, that it was not the right way. And nobody else thought it was either. But it was the world's most powerful aristocrats. What could we do? We lost all our hope in humanity."

That was how this miserable part of life came about. An announcement made by world leaders, and now the people are dying even more than before. All for the sake of maintaining population.

Revise to Up the Stakes!

Writers try different ways to up the stakes and keep their readers interested. They…

- Increase the obstacles characters face
- Make it challenging for characters to act
- Raise the character's motivation
- Or add danger or a crunch time.

"Under the new rule, both tributes from the same district will be declared winners if they are the last two alive. Claudius pauses, as if he knows we're not getting it, and repeats the change again.

The news sinks in. Two tributes can win this year. If they're from the same district. Both can live. Both of us can live.

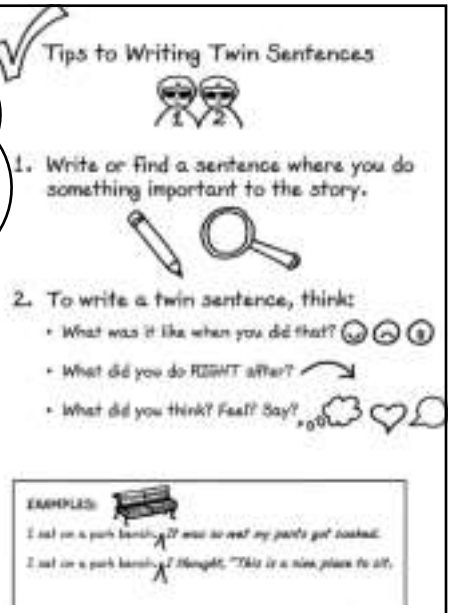
Before I can stop myself, I call out Peeta's name" (p. 231).

She walked into the room and felt scared. She looked left and right, but couldn't see much in the darkness. She continued further into the house. All of a sudden the lights turned on and the intercom said, "Welcome Kira."

As a writer, I can show my reader what's important by using sentence twinning and descriptive words. This is an important moment, and I tell the reader she's scared. I can "twin" my sentences instead.

She walked into the room and immediately felt coldness. The hairs on her arms stood up, and she shivered uncontrollably.

Revise to Show, Not Tell



Revise to Highlight Meaning and Symbolism

Now You Try!

1) Think about what your story is really about - what's the deeper meaning?
2) Re-read and look for objects, settings, or actions that connect to your meaning
3) Try describing them in detail, repeating them throughout, or making them really important to the characters
4) Always remember to re-read to make sure what you added makes your meaning clearer.

Dark They Were, and Golden-eyed, by Ray Bradbury

The very first sentence he introduces the "wind" which he uses repeatedly to emphasize the eery unknown of the planet Mars where the characters are living and symbolize what is changing and unknown throughout the story.

"The rocket metal cooled in the meadow winds. Its lid gave a bulging pop. From its clock interior stepped a man, a woman, and three children."

Then when the characters find out the rockets have been destroyed and they can never go back to Earth, Bradbury writes…

"Laura wept, 'We are stranded on Mars, forever and ever!' For a long time there was only the sound of the wind in the afternoon."

Ray Bradbury repeats the "wind" over 10 times throughout the story!

"The wind blew as if to flake away their identities."

Narrative Writing Checklist

	Conventions			
Spelling	I used the Internet and other sources to check the spelling of literary, historical, and geographical words.	☐	☐	☐
Punctuation and Sentence Structure	I used different sentence structures to achieve different purposes throughout my piece.	☐	☐	☐
	I used verb tenses that shift when needed (such as when moving from a flashback back into the present tense of the story), deciding between active and passive voice where	☐	☐	☐

Check It!

Punctuating Dialogue

- “Fool!” cried Bramante.
- “I prefer the rockets myself,” said old Bramante.
- “You understand?” he asked.

Using Commas

- He would tiptoe from bed, certain that his kind wife was dreaming, to let himself out into the night air.
- Science, comfort, new things for all! Ha!

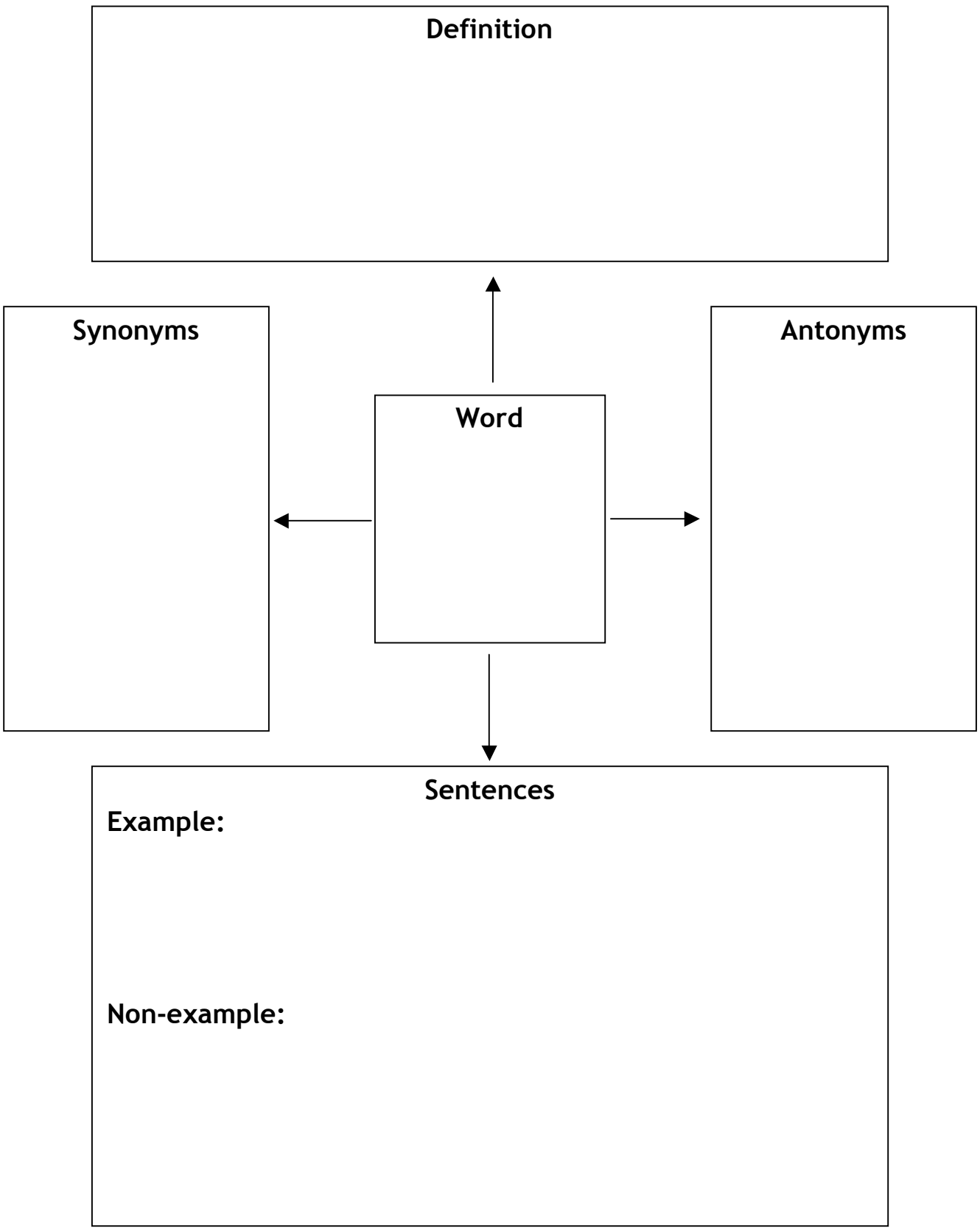
Using Apostrophes

- “Oh, its you, bramante!:
- “Think what you would see,” said Bodoni’s wife.
- It held the whiteness of the moon and the blueness of the star’s.

Last [illegible] Editing Checklist

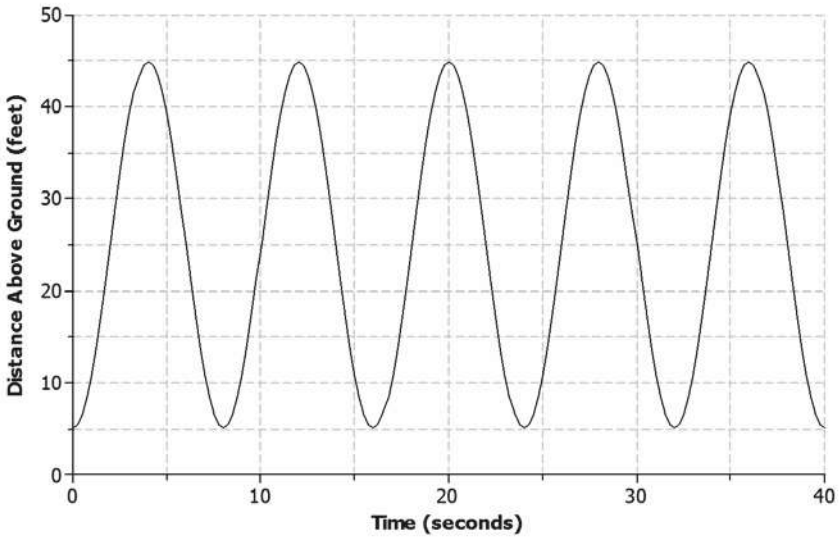
- ✓ I checked that the names of people and places are spelled correctly.
- ✓ I ran a finger over each sentence to make sure my ending punctuation is clear and that the commas seem sensible and similar to those I see in books and articles.
- ✓ I looked at my quotes and compared the very specific punctuation to these models.
  - a. Introducing the source, then giving the quotation.
    According to one witness, “The car came out of nowhere, and so did the brave bystander.”
  - b. Tucking a quote into narrative/explanation.
    A witness first claimed that “the car came out of nowhere,” before adding, “and so did the brave bystander.”
  - c. Leading with a quote, then adding narration/explanation.
    “The man swept the dog right from under the car’s wheels” was how witnesses described the incident.
- ✓ I indented or skipped lines to paragraph when the setting changes, when time changes, for a mood change, and expository paragraphs for new ideas or examples.

New Vocabulary Word: _____



Example 3: Ferris Wheel

Lamar and his sister are riding a Ferris wheel at a state fair. Using their watches, they find that it takes 8 seconds for the Ferris wheel to make a complete revolution. The graph below represents Lamar and his sister's distance above the ground with respect to time.



Exercises 6–9

6. Use the graph from Example 3 to answer the following questions.

   a. Is the function represented by the graph linear or nonlinear?

   b. Where is the function increasing? What does this mean within the context of the problem?

   c. Where is the function decreasing? What does this mean within the context of the problem?

7. How high above the ground is the platform for passengers to get on the Ferris wheel? Explain your reasoning.

8. Based on the graph, how many revolutions does the Ferris wheel complete during the 40-second time interval? Explain your reasoning.

9. What is the diameter of the Ferris wheel? Explain your reasoning.

Lesson Summary

The graph of a function can be used to help describe the relationship between the quantities it represents.

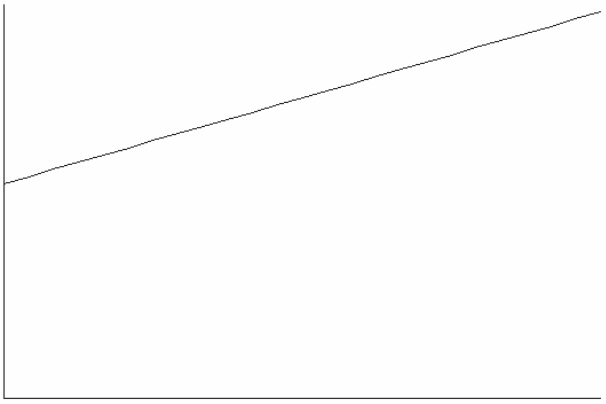
A linear function has a constant rate of change. A nonlinear function does not have a constant rate of change.

- A function whose graph has a positive rate of change is an *increasing function*.
- A function whose graph has a negative rate of change is a *decreasing function*.
- Some functions may increase and decrease over different intervals.

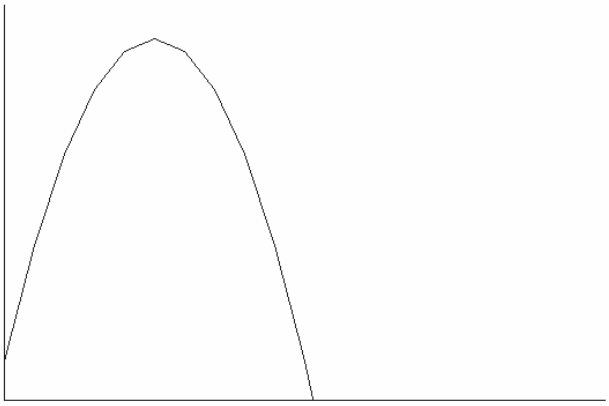
Problem Set

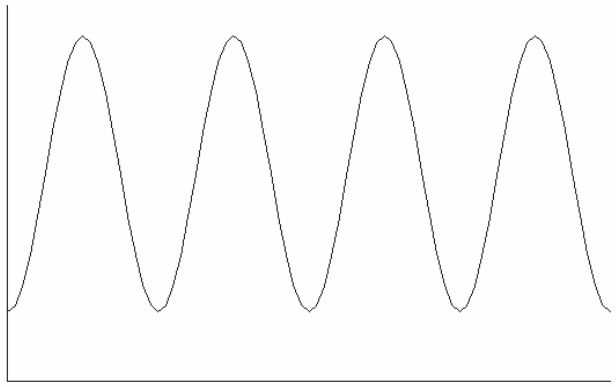
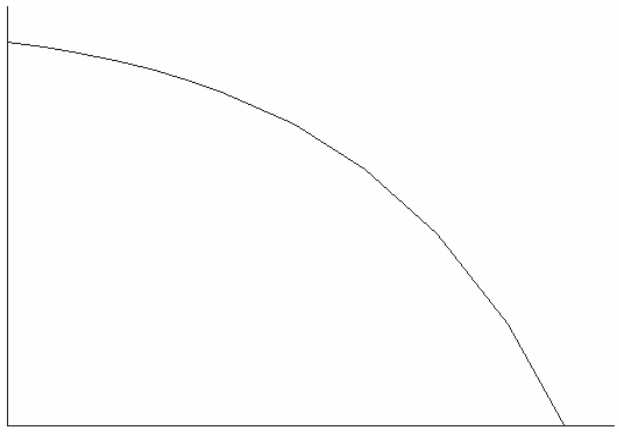
1. Read through the following scenarios, and match each to its graph. Explain the reasoning behind your choice.
   a. This shows the change in a smartphone battery charge as a person uses the phone more frequently.
   b. A child takes a ride on a swing.
   c. A savings account earns simple interest at a constant rate.
   d. A baseball has been hit at a Little League game.

Scenario: ____

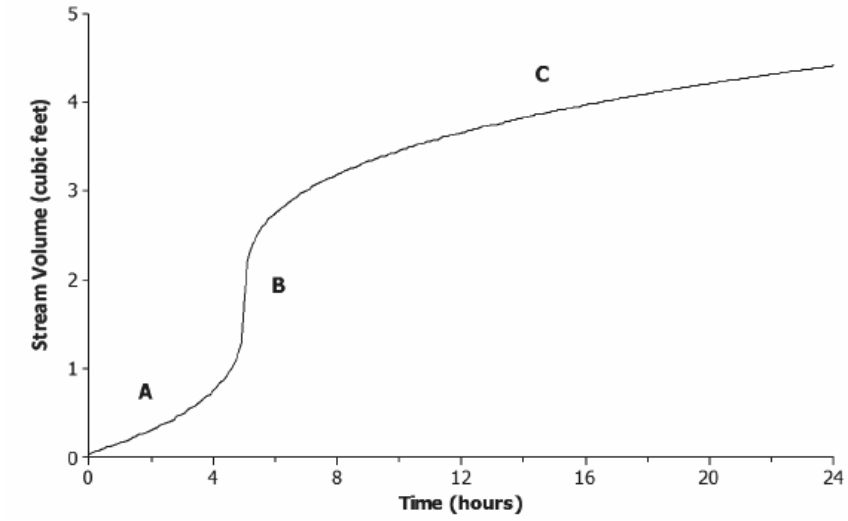


Scenario: ___



Scenario: ___	Scenario: ___
	

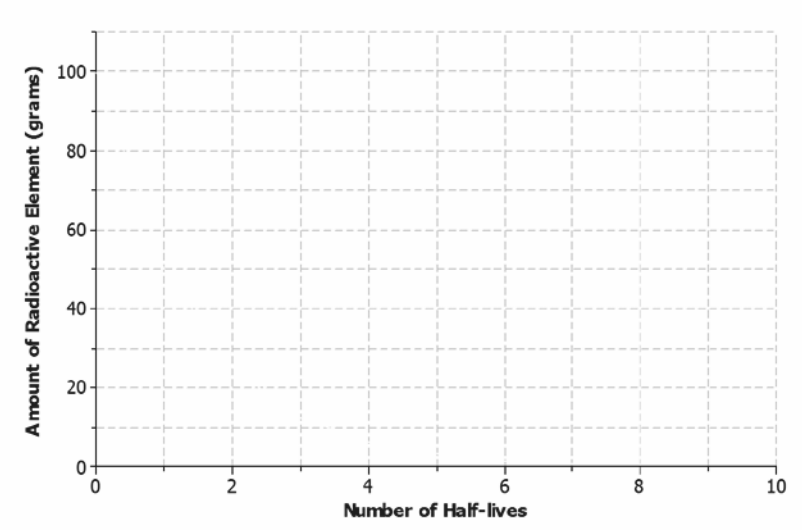
2. The graph below shows the volume of water for a given creek bed during a 24-hour period. On this particular day, there was wet weather with a period of heavy rain.



Describe how each part (A, B, and C) of the graph relates to the scenario.

3. Half-life is the time required for a quantity to fall to half of its value measured at the beginning of the time period. If there are 100 grams of a radioactive element to begin with, there will be 50 grams after the first half-life, 25 grams after the second half-life, and so on.

   a. Sketch a graph that represents the amount of the radioactive element left with respect to the number of half-lives that have passed.

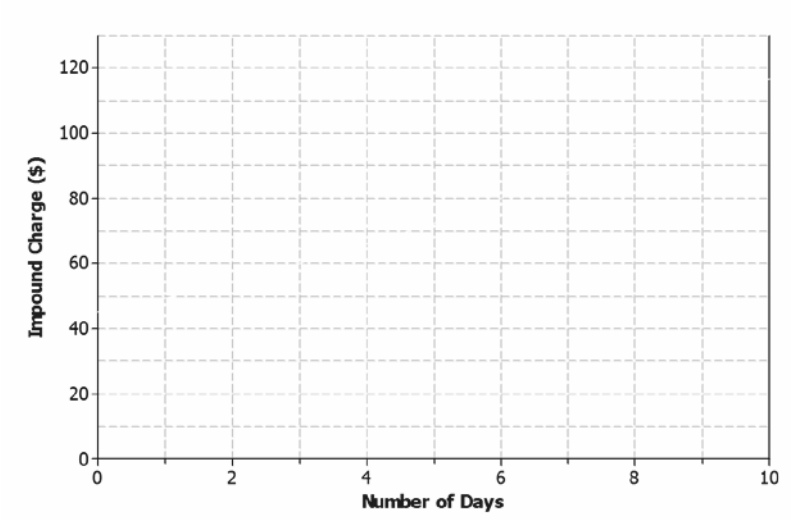


   b. Is the function represented by the graph linear or nonlinear? Explain.

   c. Is the function represented by the graph increasing or decreasing?

4. Lanae parked her car in a no-parking zone. Consequently, her car was towed to an impound lot. In order to release her car, she needs to pay the impound lot charges. There is an initial charge on the day the car is brought to the lot. However, 10% of the previous day's charges will be added to the total charge for every day the car remains in the lot.

   a. Sketch a graph that represents the total charges with respect to the number of days a car remains in the impound lot.

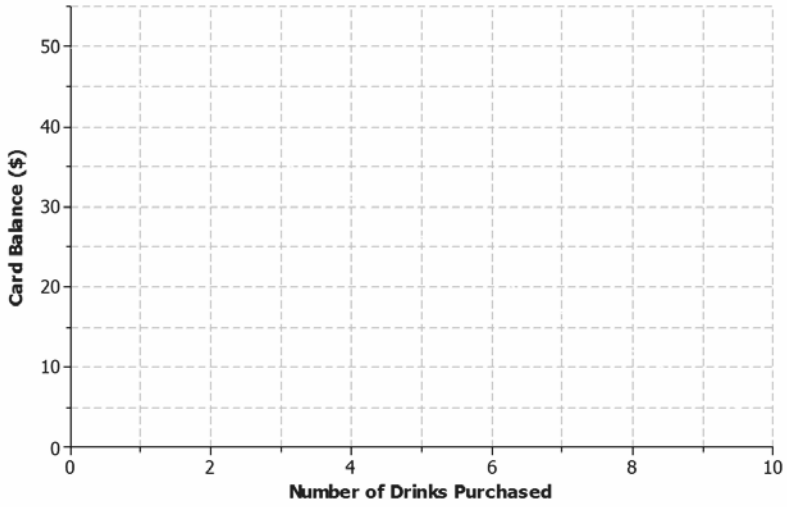


b. Is the function represented by the graph linear or nonlinear? Explain.

c. Is the function represented by the graph increasing or decreasing? Explain.

5. Kern won a $50 gift card to his favorite coffee shop. Every time he visits the shop, he purchases the same coffee drink.

a. Sketch a graph of a function that can be used to represent the amount of money that remains on the gift card with respect to the number of drinks purchased.



b. Is the function represented by the graph linear or nonlinear? Explain.

c. Is the function represented by the graph increasing or decreasing? Explain.

6. Jay and Brooke are racing on bikes to a park 8 miles away. The tables below display the total distance each person biked with respect to time.

Jay

Time (minutes)	Distance (miles)
0	0
5	0.84
10	1.86
15	3.00
20	4.27
25	5.67

Brooke

Time (minutes)	Distance (miles)
0	0
5	1.2
10	2.4
15	3.6
20	4.8
25	6.0

a. Which person's biking distance could be modeled by a nonlinear function? Explain.

b. Who would you expect to win the race? Explain.

Lesson Summary

- When constructing a scatter plot, the variable that you want to predict (i.e., the dependent or response variable) goes on the vertical axis. The independent variable (i.e., the variable not related to other variables) goes on the horizontal axis.
- When the pattern in a scatter plot is approximately linear, a line can be used to describe the linear relationship.
- A line that describes the relationship between a dependent variable and an independent variable can be used to make predictions of the value of the dependent variable given a value of the independent variable.
- When informally fitting a line, you want to find a line for which the points in the scatter plot tend to be closest.

Problem Set

1. The table below shows the mean temperature in July and the mean amount of rainfall per year for 14 cities in the Midwest.

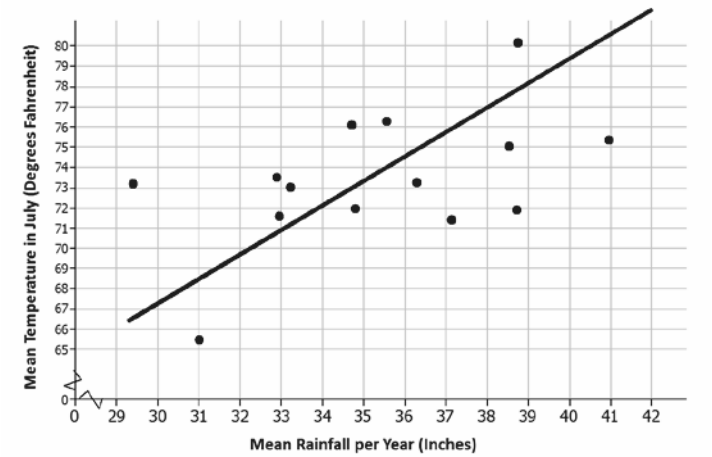
City	Mean Temperature in July (degrees Fahrenheit)	Mean Rainfall per Year (inches)
Chicago, IL	73.3	36.27
Cleveland, OH	71.9	38.71
Columbus, OH	75.1	38.52
Des Moines, IA	76.1	34.72
Detroit, MI	73.5	32.89
Duluth, MN	65.5	31.00
Grand Rapids, MI	71.4	37.13
Indianapolis, IN	75.4	40.95
Marquette, MI	71.6	32.95
Milwaukee, WI	72.0	34.81
Minneapolis–St. Paul, MN	73.2	29.41
Springfield, MO	76.3	35.56
St. Louis, MO	80.2	38.75
Rapid City, SD	73.0	33.21

Data Source: http://countrystudies.us/united-states/weather/

a. What do you observe from looking at the data in the table?

b. Look at the scatter plot below. A line is drawn to fit the data. The plot in the Exit Ticket had the mean July temperatures for the cities on the horizontal axis. How is this plot different, and what does it mean for the way you think about the relationship between the two variables—temperature and rain?

July Rainfall and Temperatures in Selected Midwestern Cities

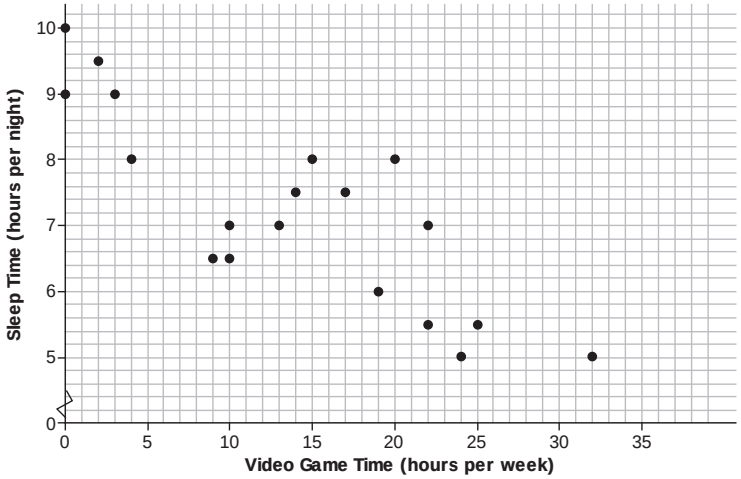


c. The line has been drawn to model the relationship between the amount of rain and the temperature in those midwestern cities. Use the line to predict the mean July temperature for a midwestern city that has a mean of 32 inches of rain per year.

d. For which of the cities in the sample does the line do the worst job of predicting the mean temperature? The best? Explain your reasoning with as much detail as possible.

2. The scatter plot below shows the results of a survey of eighth-grade students who were asked to report the number of hours per week they spend playing video games and the typical number of hours they sleep each night.

Mean Hours Sleep per Night Versus Mean Hours Playing Video Games per Week



a. What trend do you observe in the data?

b. What was the fewest number of hours per week that students who were surveyed spent playing video games? The most?

c. What was the fewest number of hours per night that students who were surveyed typically slept? The most?

d. Draw a line that seems to fit the trend in the data, and find its equation. Use the line to predict the number of hours of sleep for a student who spends about 15 hours per week playing video games.

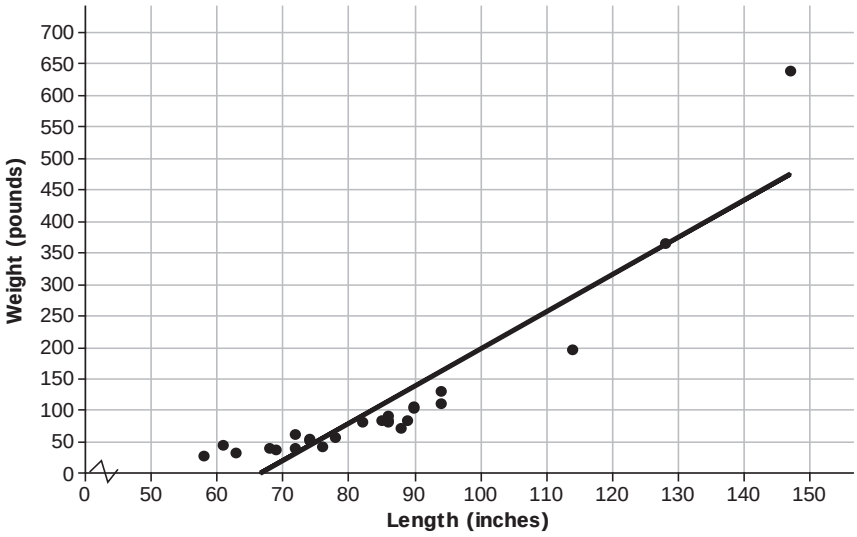
3. Scientists can take very good pictures of alligators from airplanes or helicopters. Scientists in Florida are interested in studying the relationship between the length and the weight of alligators in the waters around Florida.

a. Would it be easier to collect data on length or weight? Explain your thinking.

b. Use your answer to decide which variable you would want to put on the horizontal axis and which variable you might want to predict.

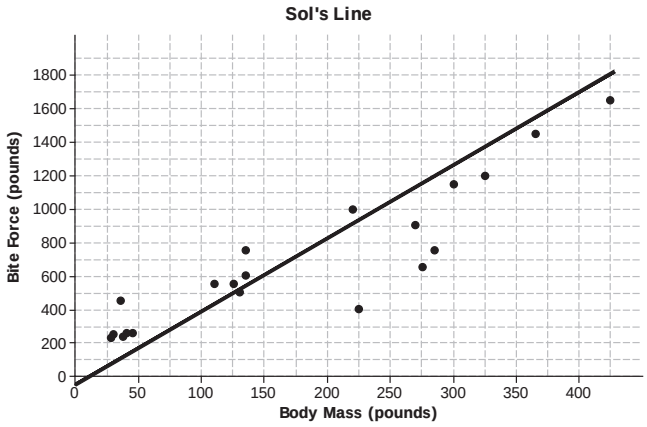
4. Scientists captured a small sample of alligators and measured both their length (in inches) and weight (in pounds). Torre used their data to create the following scatter plot and drew a line to capture the trend in the data. She and Steve then had a discussion about the way the line fit the data. What do you think they were discussing, and why?

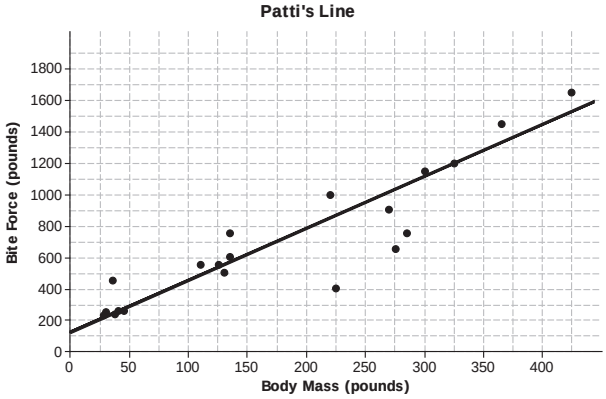
Alligator Length (inches) and Weight (pounds)

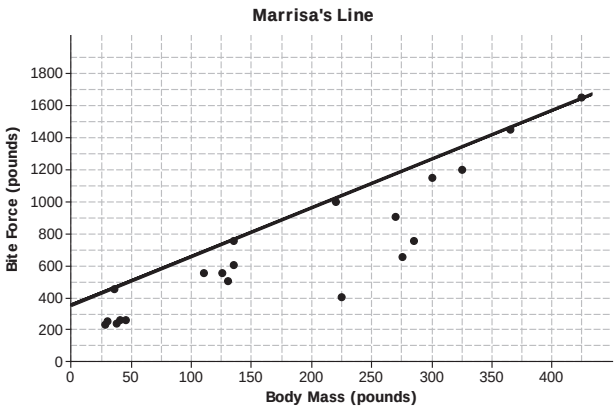


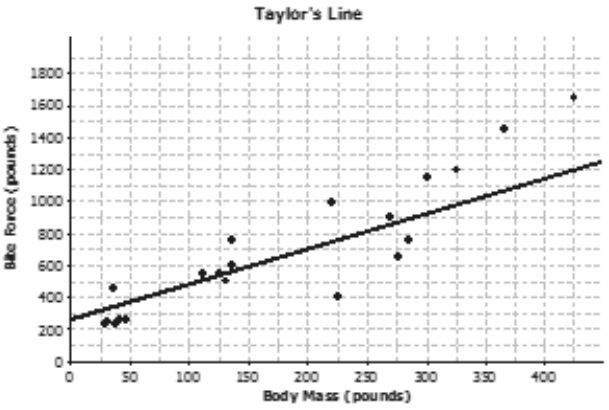
Data Source: James Landwehr and Ann Watkins, *Exploring Data*, Quantitative Literacy Series (Dale Seymour, 1987).

4. Several students decided to draw lines to represent the trend in the data. Consider the lines drawn by Sol, Patti, Marrisa, and Taylor, which are shown below.









For each student, indicate whether or not you think the line would be a good line to use to make predictions. Explain your thinking.

a. Sol's line

b. Patti's line

c. Marrisa's line

d. Taylor's line

Lesson Summary

- A line can be used to represent the trend in a scatter plot.
- Evaluating the equation of the line for a value of the independent variable determines a value predicted by the line.
- A good line for prediction is one that goes through the middle of the points in a scatter plot and for which the points tend to fall close to the line.

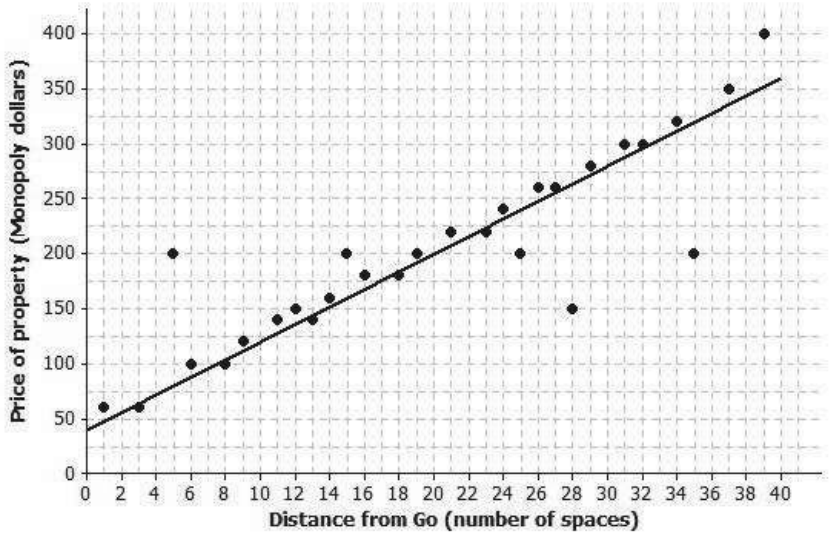
Problem Set

1. The Monopoly board game is popular in many countries. The scatter plot below shows the distance from "Go" to a property (in number of spaces moving from "Go" in a clockwise direction) and the price of the properties on the Monopoly board. The equation of the line is $P = 8x + 40$, where P represents the price (in Monopoly dollars) and x represents the distance (in number of spaces).

Distance from "Go" (number of spaces)	Price of Property (Monopoly dollars)
1	60
3	60
5	200
6	100
8	100
9	120
11	140
12	150
13	140
14	160
15	200
16	180
18	180
19	200

Distance from "Go" (number of spaces)	Price of Property (Monopoly dollars)
21	220
23	220
24	240
25	200
26	260
27	260
28	150
29	280
31	300
32	300
34	320
35	200
37	350
39	400

Price of Property Versus Distance from "Go" in Monopoly



a. Use the equation to find the difference (observed value—predicted value) for the most expensive property and for the property that is 35 spaces from "Go."

b. Five of the points seem to lie in a horizontal line. What do these points have in common? What is the equation of the line containing those five points?

c. Four of the five points described in part (b) are the railroads. If you were fitting a line to predict price with distance from "Go," would you use those four points? Why or why not?

2. The table below gives the coordinates of the five points shown in the scatter plots that follow. The scatter plots show two different lines.

Data Point	Independent Variable	Response Variable
A	20	27
B	22	21
C	25	24
D	31	18
E	40	12

Line 1 **Line 2**

a. Find the predicted response values for each of the two lines.

Independent	Observed Response	Response Predicted by Line 1	Response Predicted by Line 2

b. For which data points is the prediction based on Line 1 closer to the actual value than the prediction based on Line 2?

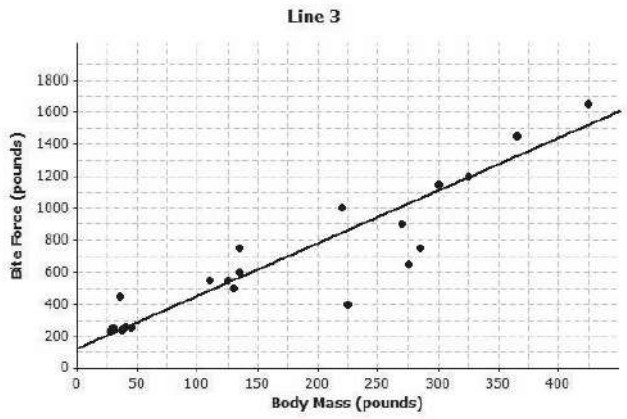
c. Which line (Line 1 or Line 2) would you select as a better fit? Explain.

3. The scatter plots below show different lines that students used to model the relationship between body mass (in pounds) and bite force (in pounds) for crocodilians.

   a. Match each graph to one of the equations below, and explain your reasoning. Let B represent bite force (in pounds) and W represent body mass (in pounds).

Equation 1	Equation 2	Equation 3
$B = 3.28W + 126$	$B = 3.04W + 351$	$B = 2.16W + 267$

Equation:	
Equation:	

Equation:	

b. Which of the lines would best fit the trend in the data? Explain your thinking.

4. Comment on the following statements:
   a. A line modeling a trend in a scatter plot always goes through the origin.
   b. If the response variable increases as the independent variable decreases, the slope of a line modeling the trend is negative.

Lesson Summary

Equations that contain variables that are squared or cubed can be solved using the properties of equality and the definition of square and cube roots.

Simplify an equation until it is in the form of $x^2 = p$ or $x^3 = p$, where p is a positive rational number; then, take the square or cube root to determine the positive value of x.

Example:

Solve for x.

$$\frac{1}{2}(2x^2 + 10) = 30$$
$$x^2 + 5 = 30$$
$$x^2 + 5 - 5 = 30 - 5$$
$$x^2 = 25$$
$$\sqrt{x^2} = \sqrt{25}$$
$$x = 5$$

Check:

$$\frac{1}{2}(2(5)^2 + 10) = 30$$
$$\frac{1}{2}(2(25) + 10) = 30$$
$$\frac{1}{2}(50 + 10) = 30$$
$$\frac{1}{2}(60) = 30$$
$$30 = 30$$

Problem Set

Find the positive value of x that makes each equation true, and then verify your solution is correct.

1. $x^2(x + 7) = \frac{1}{2}(14x^2 + 16)$

2. $x^3 = 1331^{-1}$

3. Determine the positive value of x that makes the equation true, and then explain how you solved the equation.

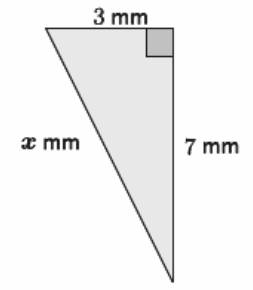
$$\frac{x^9}{x^7} - 49 = 0$$

4. Determine the positive value of x that makes the equation true.

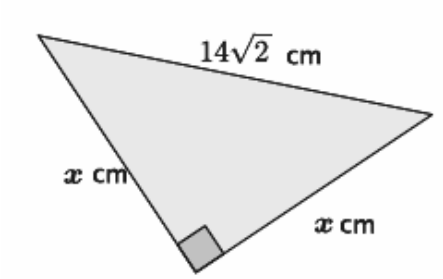
$$(8x)^2 = 1$$

5. $\left(9\sqrt{x}\right)^2 - 43x = 76$

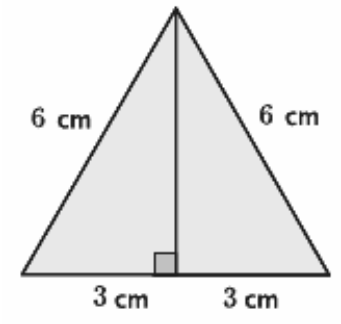
6. Determine the length of the hypotenuse of the right triangle below.



7. Determine the length of the legs in the right triangle below.



8. An equilateral triangle has side lengths of 6 cm. What is the height of the triangle? What is the area of the triangle?



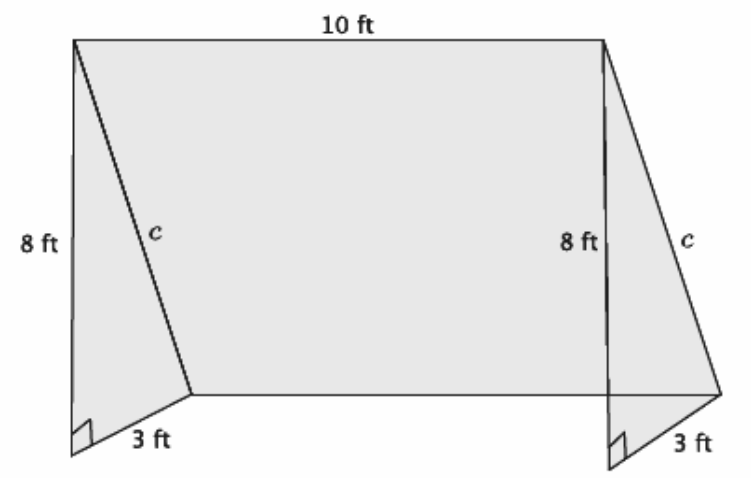
9. Challenge: Find the positive value of x that makes the equation true.

$$\left(\frac{1}{2}x\right)^2 - 3x = 7x + 8 - 10x$$

10. Challenge: Find the positive value of x that makes the equation true.

$$11x + x(x-4) = 7(x+9)$$

2. The diagram below is a representation of a soccer goal.



a. Determine the length of the bar, c, that would be needed to provide structure to the goal. Round your answer to the tenths place.

b. How much netting (in square feet) is needed to cover the entire goal?

Name: _____ Date: _____

Solving Inequalities

1. Solve the inequality and graph the solution.

$2x + 5 > 22$

2. Which of the following is NOT A SOLUTION to the following inequality?

$-2x + 3 \leq 9$

a. -3
b. 0
c. -5
d. -1

3. Solve the inequality.

$\frac{y}{-2} + 3 < 5$

a. y < 4
b. y >-4
c. y< -4
d. y >4

4. Solve and graph the following inequality.

$\frac{y}{-3} + 12 \geq 16$

5. Solve for the inequality for w.

$-2w < -10$

a. $w > 20$

b. $w < -5$

c. $w < -2$

d. $w > 5$

6. Solve the following inequality.
   $2x < 8$
   a. x<8
   b. x<4
   c. x>4
   d. x>8

7. $5x - 125 < 10 - 15x + 1$
   a. x<7
   b. 3.7=x
   c. 7.3>x
   d. x>7.3

8. $9 + p \leq 17$
   a. $p \leq 8$
   b. $p \geq 8$
   c. $p > 8$
   d. none of the above

9. Solve the inequality $-5x \leq 25$
   a. $x \leq 5$
   b. $x \geq -5$
   c. $x < 5$
   d. $x \geq 25$

ZIP LINE

DESIGN SQUAD™ PBS®

as built on TV™

pbs.org/designsquad

YOUR CHALLENGE

Design and build something that can carry a Ping-Pong ball from the top of a zip line string to the bottom in four seconds (or less!).

BRAINSTORM & DESIGN

Look at your materials and think about the questions below. Then sketch your ideas on a piece of paper or in your design notebook.

1. Using these materials, what can you design that can carry a Ping-Pong ball down a zip line?
2. How will your Ping-Pong ball carrier stay on the zip line as it goes from the top to the bottom?
3. What kinds of materials should be in contact with the zip line so that the carrier slides quickly?

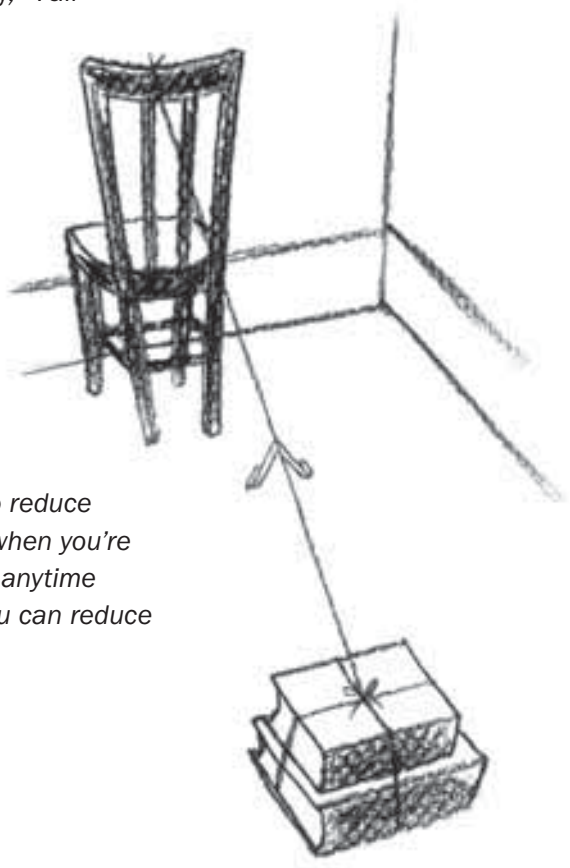
BUILD, TEST, EVALUATE & REDESIGN

Use the materials to build your Ping-Pong ball carrier. Then make a zip line. Run the line between the back of a chair and a stack of books. Make sure the high end is about two feet above the low end. Test the carrier by putting it on the line. When you test, your design may not work as planned. The design process is all about "if at first you don't succeed, then try, try again." On *Design Squad,* we say, "Fail fast—succeed sooner!" Study the problems and then redesign. For example, if your Ping-Pong ball carrier:

- keeps dropping the ball—*Check that it has a big enough place to hold the ball.*
- stops partway down—*Make sure there's nothing blocking your carrier where it touches the line.*
- doesn't balance well—*Adjust the weights. Add weights or move them so they are farther below the zip line. Doing this changes the carrier's* **center of gravity***, the point within an object where all parts are in balance with one another. See how changing the numbers and positions of washers affects the carrier's balance.*
- takes longer than four seconds to travel the zip line—*Find ways to reduce friction. Yes, there's* **friction***—the force that resists motion—even when you're dealing with something as smooth as fishing line. You'll find friction anytime things rub together. Experiment with different materials to see if you can reduce friction and speed up the Ping-Pong ball carrier.*

MATERIALS (per person)

- chipboard (from a cereal box or back of a notepad)
- 2–4 small paper cups (i.e., 3-ounce)
- Ping-Pong ball
- 4 plastic straws
- scissors
- single-hole hole punch
- 4 feet of smooth line (e.g., fishing line or unwaxed dental floss)
- tape (duct or masking)
- 4 standard, flat steel washers (1 inch in diameter or larger)
- 4 wooden skewers



TAKE IT TO THE NEXT LEVEL

- Slow down! Build a carrier that takes ten seconds to travel the length of the zip line.
- Piggyback time. Make a carrier that can hold several Ping-Pong balls at the same time.
- Blast off! Find a way to launch the Ping-Pong ball when the carrier gets to the end of the zip line.
- On your mark. Get set. Go! Set up two zip lines and race different ball carriers.

MAKE IT ONLINE

Travel by blimp, anyone? Build a jet-propelled blimp that can travel across a large room. Make it out of 2 balloons, 2 straws, and some clay and tape. See how on Make Magazine's project page at makezine.com/designsquad.

ENGINEERING IN ACTION

Ever want to zip up the side of a building like Batman or Spiderman? Now this superpower can be yours, thanks to engineer Nate Ball, host of *Design Squad*, and his friends. For a contest, they designed and built a climbing device that could carry a person 50 feet up the side of a building in less than five seconds. After months of work, the team tested their climber by lifting a 150-pound load of tires. Nate recalls, "After a few seconds, there was an awful sound. The gearbox exploded. The tires smashed to the ground with a huge crash." After analyzing the ruined climber, they made lots of changes and ended up winning third prize in the contest. Ultimately, they patented the climber and started a company to sell it. Today, soldiers, firefighters, and rescue workers around the world use the team's climber to fly up buildings. Now, those are *real* superheroes.

DESIGN SQUAD PBS®

Watch the DESIGN SQUAD Backyard Thrill Ride episode on PBS or online at pbs.org/designsquad.

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Design Squad is produced by WGBH Boston.

Grade 8 Science

Can You Trust Physics?

Phenomenon

You and a friend see a YouTube video and wonder about why this works…

"Trust in Physics" - Bowling Ball Pendulum https://www.youtube.com/watch?v=xXXF2C-vrQE
(choose a portion)
OR
Cannon Recoil https://www.youtube.com/watch?v=EL13quhcUMw

Stimulus

Masses, Diameters, and Forces for Various Objects			
Item	Mass (kg)	Diameter (cm)	Force (N)
golf ball	0.046 kg	4,3 cm	
marble	0.005 kg	1 cm	
playground ball	0.3kg	22 cm	
bowling ball	7.26 kg	22 cm	
baseball pitch	0.145 kg	7.5 cm	12 N
bullet being shot	0.0042 kg		4 N

Prompt
Choose any of the objects from the table above and use them to plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. Use the graphic organizer on the following page. On the back of the graphic organizer, explain how changing the mass of the ball, or the force applied to the ball, would change the motion of the (bowling ball pendulum or cannon).

Planning and Carrying Out Investigations

1 Identify the **Research Question**

Cause

3 Identify the Cause

Mechanism

4 Identify the Effect

Effect

2 Sketch and label the **Lab Setup**

5 List ten **Constants**

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

6 Record the Procedure Steps

Grade 8 Social Studies

What is technology's impact on social movements?

Today's activists use social media as a tool to collaborate and plan protests, to prompt discussions about their ideas and to communicate demands for change.

Watch this video: Internet Activism and Social Change
https://mass.pbslearningmedia.org/resource/eotp16-soc-socialmedia/wgbh-world-channel-civil-rights-internet-activism-and-social-change/

Is social media an effective replacement for one of the hallmarks of grassroots campaigns: face-to-face engagement? Name at least one advantage and one disadvantage for each of the following types of campaign work when done through only social media compared to using posters, newspapers, and in-person contact.

	Advantages of Social Media	Disadvantages of Social Media
Planning and coordinating events		
Discussing ideas		
Educating and sharing persuasive information		
Communicating demands for change		
Building trust and personal working relationships		

ESL at Home 6-8 Weeks 11-12

Use notebook paper to complete these activities. Do one each day!

Monday	Tuesday	Wednesday	Thursday	Friday
Pick a character from a book. Write 3 different messages that character would post on social media! Can include pictures! 	Find **10 random food items** of your choice in your house. Line them up in alphabetical order. A-Z. **Example:** Crackers, Apple, Banana ↓ **A**pple, **B**anana, **C**rackers	Write a letter to students that will be in 6th grade next year. What do they need to know to be a successful middle schooler or 6th grader? Make sure you share with your teacher!	Create a poster on a piece of paper to persuade others about **conservation**. It can be about recycling, saving an endangered species, etc. 	Write your own math problem and solve it. Then, write to explain how you solved it. **Example**: 5/8+7/11= First, ____. Next, ___. Last, ____.
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Rewrite part of a fiction story from a different **point of view**. Does the story change? What would we learn about different characters? Be creative!	Use things around your house to create an invention to launch items into the air using **force**. How do you get items to go farther? Less distance? Higher? Sketch and label your invention.	Practice reading aloud to someone in your family. Then, ask your family member questions about the text to see if they were listening!	Find 5 things in your home that have **acute angles**. Find 5 things in you home that have **obtuse angles**. Find 5 things in your home with lines that are **parallel**. Sketch and label these items!	Write your opinion on distance learning. How do you feel about learning from home? Do you like it/dislike it? Why? Write three reasons. I like/dislike distance learning. First, ____ because ____. Another reason I ____ is because ____. Finally, _____.