

FOURTH GRADE VIRTUAL LEARNING ASSIGNMENTS

WEEK OF MAY 11-14

	MATH	ELA
	TOPIC 14: ALGEBRA: GENERATE & ANALYZE PATTERNS	PAIRED TEXT TOPIC: <u>OPINION</u> “TWO VIEWS ON VIDEO GAMING” (POSITIVE VS. NEGATIVE)
MONDAY	LESSON 14-1 1. Read the essential question and important math ideas on page 734. 2. Complete the independent practice and problem solving on pages 735-736.	Read text #1: “Student Opinion: Video Gaming Can Be Good for Our Minds” Complete the VOCABULARY & COMPREHENSION activities for this article.
TUESDAY	LESSON 14-2 1. Read the essential question and important math ideas on page 740. 2. Complete the independent practice and problem solving on pages 741-742.	Read text #2: “Student Opinion: Too Much Time Spent Playing Video Games Can Damage Kids’ Brains” Complete the VOCABULARY & COMPREHENSION activities for this article.
WEDNESDAY	LESSON 14-3 1. Read the essential question and important math ideas on page 746. 2. Complete the independent practice and problem solving on pages 747-748.	Reread both texts and complete the WRITING response: Write a three paragraph essay explaining which text you side with. Be sure to include at least two pieces of evidence from the text that convinced you to choose this side.
THURSDAY	LESSON 14-4 1. Read the essential question and important math ideas on page 752. 2. Complete the independent practice and problem solving on pages 753-754.	“POETRY THURSDAY” <u>HAIKU</u> Read the directions and examples on how to write a haiku. On the attached template, write a haiku poem of your own.

IN ADDITION, STUDENTS MUST COMPLETE 20 MINUTES OF LEXIA AND 20 MINUTES OF IMAGINE MATH DAILY.

FOURTH GRADE VIRTUAL LEARNING ASSIGNMENTS
WEEK OF MAY 18-22

	MATH	ELA
	FINISH TOPIC 14; TOPIC 15: GEOMETRIC MEASUREMENT	PAIRED TEXT TOPIC: <u>MAIN IDEA</u> “A NONFICTION & FICTION TEXT ABOUT THE POWER OF WORDS”
MONDAY	TOPIC 14 TEST	Read text #1: “Oxford English Dictionary” (nonfiction article) Complete the VOCABULARY & COMPREHENSION activities for this article.
TUESDAY	LESSON 15-1 1. Read the essential question and important math ideas on page 772. 2. Complete the independent practice and problem solving on pages 773-774.	Read text #2: “Translating Aunt Edna” (fiction story) Complete the VOCABULARY & COMPREHENSION activities for this story.
WEDNESDAY	LESSON 15-5 1. Read the essential question and important math ideas on page 796. 2. Complete the independent practice and problem solving on pages 797-798.	Reread both texts and complete the WRITING response. Answer the following questions by using the R.A.C.E. strategy: What is the main idea of both texts? How are both texts related? Use evidence from both texts to support your response.
THURSDAY	LESSON 15-5 Complete the following activities: “Reteach to Build Understanding” and “Math/Science Activity”	“POETRY THURSDAY” <u>CINQUAIN</u> Read the directions and examples on how to write a cinquain. On the attached template, write a cinquain poem of your own.

IN ADDITION, STUDENTS MUST COMPLETE 20 MINUTES OF LEXIA AND 20 MINUTES OF IMAGINE MATH DAILY.

Student Opinion: Too much time spent playing video games can damage kids' brains

By Margaret Buckler, student contributor, adapted by Newsela staff on 08.16.18

Word Count **559**

Level **610L**



Is playing video games bad for kids' brains? One student argues that they are. Image: Newsela staff

It's an invasion! Nope, not an alien invasion – a video game invasion. Video games are very popular with kids.

A study was done in 2011 by the group NPD. It said that more than 9 out of 10 kids played video games. That number has probably only gone up since then.

Children have growing minds and bodies. Too much video gaming is unhealthy for them.

Fortnite, Roblox and Minecraft are popular online games. Two or more people can play together at the same time. In the last 30 days, many people searched for Fortnite on Google. It was searched for more than U.S. history topics. Searches for Roblox were higher than biology searches. Biology is the study of living things.

It is clear kids are addicted to video games. They care about them more than school subjects.

Computers and tablets are easy to find. They are used in a lot of classrooms. Students can easily switch from educational websites to computer games. I see this very often. Video games are all kids want to do these days.

Brain Cells Are Dying

Adults often say that too much screen time can damage your brain. This is actually true. Studies were done at the University of Montreal in Canada. They watched people playing "shooter" games. These can harm the hippocampus area of the brain, they found. The hippocampus helps us store memories. Hurting it can kill brain cells. Damage to this part of the brain can also increase the chances of different mental illnesses. This includes Alzheimer's. It is a disease that causes people to lose their memory.

Such damage may also lead to depression.

Mental illnesses are serious. They are different than feeling sad. Feeling sad, lonely or unhappy sometimes is normal. The feelings usually go away. Mental illnesses affect someone's mood, thoughts and behavior for a longer time. Someone who is very depressed could have a mental illness. Daily life can be very hard for someone with a mental illness. Doctors can usually help.

Fortnite and Grand Theft Auto are popular games. They include guns and bad language. Many studies have shown that violent video games can increase violent behavior. Younger children often play these games.

In one study, some participants played violent games in a lab. Others in the experiment played nonviolent games. After, the researchers measured the behavior of each group. People who played the violent games were more violent.

Bad For The Body And The Mind

Constantly playing video games can hurt the body. It can also hurt the mind.

If people are busy gaming they might not shower as much. So gaming all the time can make people less clean.

It can also cause eye strain. Stressed eyes can lead to migraines. They are really painful headaches.

It is unhealthy for children to look at a screen all day. Kids should be outside playing sports. Instead, they are sitting inside playing sports on a screen.

Video gaming is very popular. While playing, it can be hard to realize all the bad effects it has on the brain and body. We must take a closer look at these bad effects. We should not be mindlessly gaming all day.

Do you have an opinion to share on an issue affecting your school or community? Students may submit their original opinion piece to editorial@newsela.com



About the Writer:

Margaret Buckler is a middle school student and writer. She is eager to reach new people through writing, and open them up to new topics and opinions.

1 Read the paragraph from the introduction [paragraphs 1-6].

Fortnite, Roblox and Minecraft are popular online games. Two or more people can play together at the same time. In the last 30 days, many people searched for Fortnite on Google. It was searched for more than U.S. history topics. Searches for Roblox were higher than biology searches. Biology is the study of living things.

What is the author's point of view about kids researching video games?

- (A) Kids would rather research video games than do schoolwork.
- (B) Kids have just realized they can research how to play video games.
- (C) Kids spend time researching video games when they are in school.
- (D) Kids are researching ways to include video games in their school lessons.

2 The author has an opinion about kids playing video games.

Which sentence from the article shows this?

- (A) It said that more than 9 out of 10 kids played video games.
- (B) Students can easily switch from educational websites to computer games.
- (C) Someone who is very depressed could have a mental illness.
- (D) It is unhealthy for children to look at a screen all day.

3 According to the author, what is one problem with children playing video games?

- (A) Children who play video games earn lower grades.
- (B) Video games can cause painful headaches.
- (C) Children who play video games never go outside.
- (D) Video games are not always educational.

4 Read the following selections from the section "Brain Cells Are Dying."

In one study, some participants played violent games in a lab.

After, the researchers measured the behavior of each group. People who played the violent games were more violent.

The first sentence is a cause and the second selection is an effect. What is something the author does to show this connection?

- (A) The first sentence previews the study by giving background knowledge.
- (B) The author explains why playing video games can be harmful.
- (C) The author describes the results of different parts of the study.
- (D) The second selection starts with "after" which shows that something else caused it to happen.

Student Opinion: Video gaming can be good for our minds

By Cheney Wu, student contributor, adapted by Newsela staff on 02.20.19

Word Count **625**

Level **700L**



Video games aren't all bad. In fact, 11-year-old Cheney Wu argues that they can even be good for managing stress, increasing heart rate and making friends. Photo by: Getty Images

This opinion article by Cheney Wu was submitted to Newsela in response to an article titled "Student Opinion: Video games are rotting kids' brains" by Margaret Buckler that was published August 16, 2018.

Video Games Are Not Rotting Our Brains

Your article, "Student Opinion: Video games are rotting kids' brains," says that video games harm our minds. I think some parts of the article do not make sense.

I agree that too much video gaming is not a good thing. It leaves you with no time for your schoolwork. But what is wrong with 30 minutes to one hour of playing? I think playing video games can be helpful.

They Help Improve Eyesight, Reflexes

Playing games can help you learn. Some gamers are better at focusing on 3-D objects than non-gamers. Gaming can also lead to an improvement in math and other subjects.

Video games also improve eyesight. For example, in shooter games, you focus on a target and shoot. This improves your reflexes. It is an exercise for your eyes. Eyesight gets worse when we reach a certain age, but video games may improve it.

Many video games are very social. You talk to friends while you play. We make a huge amount of friends on them. If you are the only one who does not play video games in your school, then you do not know what's happening. You will feel left out. Video games allow you to have a shared interest with many people at school.

They Can Also Help With Learning

Video gaming may help to improve decision-making. When you play, your brain and hands need to work together. You need to think and then apply what you are thinking to your game. Over time, your hand and head work together without even thinking. This helps you make decisions quickly.

You said in your article that learning is more important than gaming. I think video games improve focus and attention. You can focus more when a person is talking. People can get your attention faster. This is because video games have fast motion in them. It trains your mind to think quickly and focus so you won't make mistakes. It helps you stay focused in other areas of your life, like when a teacher is talking.



Active Gaming Can Be A Form Of Exercise

The American Academy of Pediatrics is a group of doctors who help children. They studied people who play active games. In these games, you move your body around. The doctors also studied people who walk on a treadmill. A treadmill is an exercise machine. They found that active gamers are as healthy as people who walk fast on the treadmill every day. This shows that active video games can be good for you.

Playing video games helps you learn from your mistakes faster. When you are playing video games, you often make mistakes. The mistakes stay in your head. You work hard not to make them again. You can apply those skills to your life and quickly learn from your mistakes in the real world.

There Are Many Upsides To Gaming

Finally, playing video games helps some people relax. Video games can help you calm down.

Video games have many upsides. Parents should take their time and study the information. Instead, they often just say, "Too many video games, kids." It is important to look at the many good parts of playing video games.

Cheney Wu is 11 years old and lives in Vancouver, Canada. He enjoys swimming and playing with friends. He likes reading and writing his own stories and comics. He codes and plays video games.

- 1 Which statement would the author MOST likely agree with?
- (A) Parents should take some time to learn about the good things that can come from video games.
 - (B) Playing video games is a fun way to spend time that has little effect on kids' regular lives.
 - (C) There are some video games that help kids learn better but many that make it harder to learn.
 - (D) The kids who play video games often may have a harder time making friends when at school.
- 2 How does the author of "Student Opinion: Video games are rotting kids' brains" describe video games? How is this different from the author of this article's description?
- (A) The author of "Student Opinion: Video games are rotting kids' brains" says that gamers have very good eyesight but the author of this article says video games are bad for eyesight.
 - (B) The author of "Student Opinion: Video games are rotting kids' brains" says that gaming is bad for kids' physical health but the author of this article says that it improves physical health.
 - (C) The author of "Student Opinion: Video games are rotting kids' brains" says that playing video games harms kids' minds but the author of this article thinks they can help kids in school.
 - (D) The author of "Student Opinion: Video games are rotting kids' brains" says that video games should be limited to an hour a day but the author of this article says they should have no limits.
- 3 According to the article, playing video games can help you learn.
How does the author support this claim?
- (A) The author provides facts and data about video games and grades.
 - (B) The author provides firsthand accounts from students who like video games.
 - (C) The author includes statements from teachers about student gamers.
 - (D) The author includes his observations about how gaming improves focus.
- 4 Read the sentence from the section "Active Gaming Can Be A Form Of Exercise."

They found that active gamers are as healthy as people who walk fast on the treadmill every day.

How does the author use this sentence to support the idea that gaming can be good for your health?

- (A) The author compares the health of gamers to people who exercise every day.
- (B) The author describes the way that gamers can get healthy on a treadmill.
- (C) The author provides evidence that walking on a treadmill is good for you.
- (D) The author gives data about how many active gamers doctors studied.

Translating Aunt Edna

By Rhonda Telfer, Cricket Media on 01.14.20

Word Count **491**

Level **MAX**



"It is my obligation to increase your vocabulary," says Aunt Edna. Illustrations: James Serafino/Cricket Media

We love our Aunt Edna. She's kind and sweet, she brings us donuts, and her dog Webster knows cool tricks. But every time she visits, she announces, "It is my obligation to increase your vocabulary."

Translation: she always teaches us new words. Lots of them.

When she arrives, she says, "It is time for a familial embrace!" Translation: a hug no matter what, even if she is wearing too much perfume and her buttons poke us in the eye.

When she makes lunch, she says things like, "The legumes are delectable." Translation: the peas are good, so don't hide any under your mashed potatoes.

She doesn't teach us manners, oh no. She teaches us to "avoid the social faux pas." Translation: don't embarrass her in public by burping on the bus or snorting through our noses when we laugh.

One day, when we were out "perambulating" Webster (Translation: walking him), little Hank said, "My brain is dizzy from all those big words."

"Mine, too. I can't even pronounce half of them," said Matt.

"Legumes don't taste any better than peas. We need a plan," I replied.

"A plot," said Matt.

"An effective scheme," said little Hank.

We stopped to watch Webster perambulate on his hind legs.

"I've got it!" I said. I whispered my idea and told them to make serious faces when we went inside. When we walked in the front door, Aunt Edna asked if we had "enjoyed our diversions."

"Yes," I translated, "We had lots of fun. But the cal-lee-hop-adids were really biting."

"Oh my," said Aunt Edna. She scrunched her eyebrows. After supper, she spent an hour looking through the encyclopedia for advice on preventing calleehopadid bites, but she could not find a thing.

Then she suggested we play Scrabble.

"I'm sorry," Matt said, "but I have to finish building my edi-fac-tabulous malli-pod, before the glue dries."

Aunt Edna tried desperately to find a description of an edifactabulous mallipod so she could help, but there was nothing in the books.

We told her we couldn't take baths because there were reports of "glaw-ba-tious bacter-yo-nee" in the local water. She spent the rest of the evening searching the news for updates on the epidemic. Poor Aunt Edna.

At bedtime, she looked tired. Exhausted. Fatigued. But she still asked, "Shall I read to you?" And little Hank, schemer of schemers, said, "Please do. May I suggest something yawny-fic-atiuous?"

How about ..."

"... the dictionary!" we cried.

Aunt Edna looked confused. She reached for the dictionary. "How do you spell yawny—"

Then she smiled. She grinned. She giggled and chuckled and laughed and tilted her head back and got downright boisterous. She even snorted through her nose!

"OK, you got me," she said. "Your pranks were quite clever. You're the cat's pajamas and the bee's knees!" (Whoa! What did that mean?!)

Then Aunt Edna hugged us, turned off the light, and went downstairs. We happily, gleefully, and mirthfully fell asleep.

- 1 Which statement about Aunt Edna is true?
- (A) She does not have very good manners when she visits.
 - (B) She likes to make up new words to use around her family.
 - (C) She wants to help her nephews learn bigger words.
 - (D) She is angry that she has to visit her nephews.

- 2 Why do the nephews make up new words?
- (A) to prank their Aunt Edna
 - (B) to explain a new experience
 - (C) to describe something they saw
 - (D) to help Aunt Edna use a dictionary

- 3 Read the sentence from the story.

But every time she visits, she announces, "It is my obligation to increase your vocabulary."

What does the word "obligation" mean?

- (A) woe
- (B) duty
- (C) dream
- (D) failure

- 4 Read the sentence from the story.

When we walked in the front door, Aunt Edna asked if we had "enjoyed our diversions."

What does the author mean by the word "diversions"?

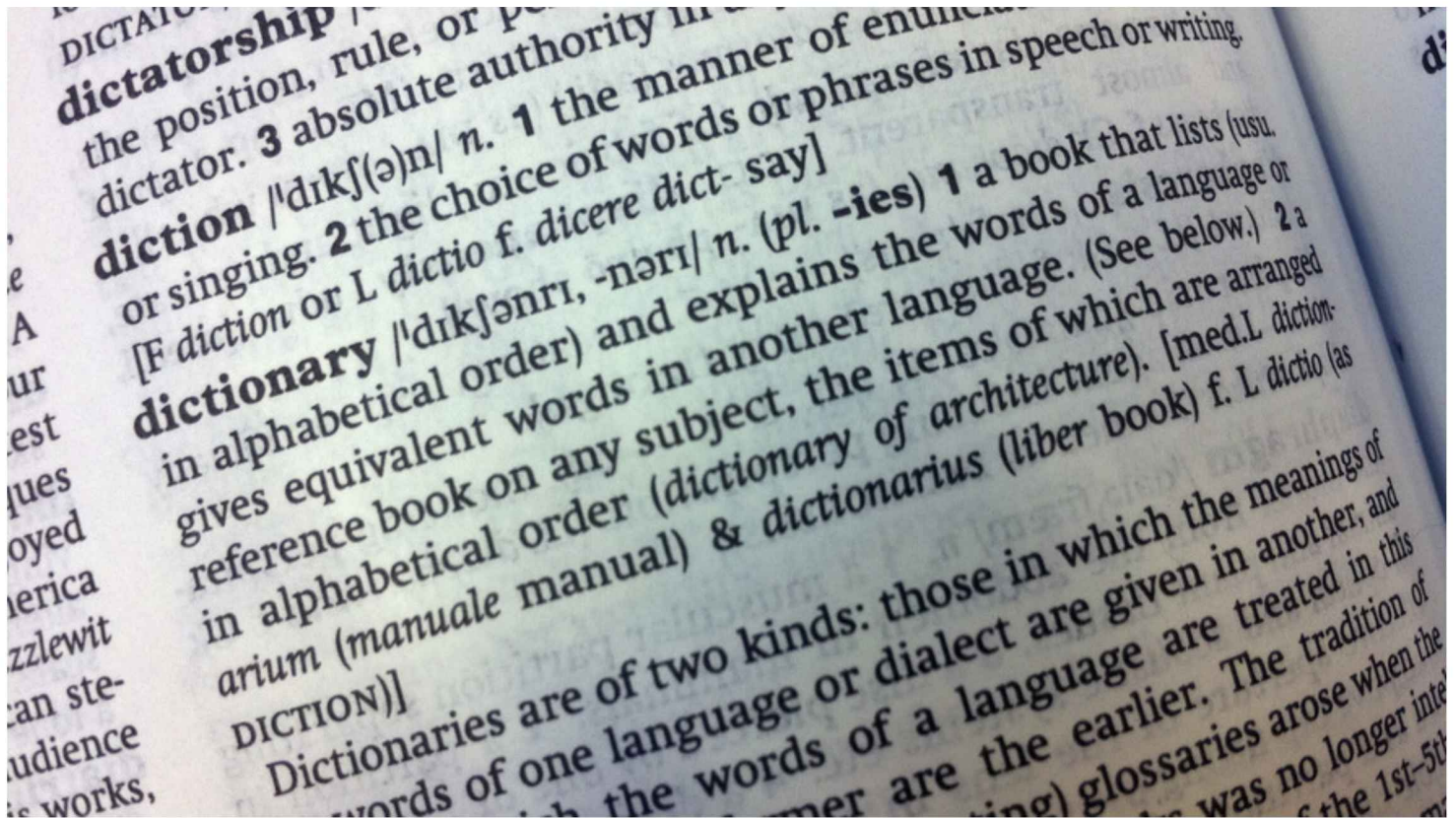
- (A) chores
- (B) jokes
- (C) classes
- (D) amusements

Oxford English Dictionary collects some unusual and funny words

By Alison Flood, The Guardian, adapted by Newsela staff on 07.16.18

Word Count 419

Level 580L



The entry in the Oxford English Dictionary defining (what else?) dictionary. Photo by: Associated Press

Most people in the United States speak English. In different parts of the U.S., people use different words to say the same thing. Those words might not be used anywhere else.

Around the world, people speak English. Some are in the United Kingdom, which includes England. Some are in other countries such as New Zealand.

People around the world have also come up with their own English words.

The Oxford English Dictionary is asking people to help it add new words. The dictionary is called OED for short. The people who put together the dictionary are called editors. They want to find the differences in English around the world.

People have given them words to add. One word, "hammajang," is from Hawaii. It means things are messed up.

English From Around The World

Last year, the OED asked for words in the United Kingdom. More than 100 words and phrases were added to the dictionary. One phrase was "cuddy wifter," which means a left-handed person.

Now, the OED is asking for words from English speakers around the world. Eleanor Maier is an editor at OED. She said the response has been great. Editors are making a list of words that might go in the dictionary.

One is the word for a swimsuit, "dookers" or "duckers." It is used in Scotland. There is also New Zealand's "munted," which means "broken."

The OED also might include the word "frog-drowner." Americans might use it to say heavy rain. Another possibility is "brick." It means "very cold" to people in New Jersey and New York City.

A loved one could be called a "pet" or "dou-dou" in different places.

Words Show Where People Come From

"The OED aims to cover all types of English," Maier said. It is important to include these words, she said.

Some of the ideas to add in the United Kingdom go back many years, such as "zamzawed." It is a word for food that has been cooked too long. One word that has already been added is "barry." It means great.

Maier said that it can be hard for the editors to find certain words. People say them but might not write them down.

Some words show where people come from, said Maier. They can be part of how people see themselves, she said.

Words from certain places have always been in the OED. Some include "ginnel" (an alley) and "far-welted" (a sheep on its back). Others are "nesh" (cold), "clarty" (very muddy) and "throng" (busy).

1 Read the paragraph from the section "English From Around The World."

Now, the OED is asking for words from English speakers around the world. Eleanor Maier is an editor at OED. She said the response has been great. Editors are making a list of words that might go in the dictionary.

Which sentence from the paragraph shows many people have sent words to the OED?

- (A) Now, the OED is asking for words from English speakers around the world.
- (B) Eleanor Maier is an editor at OED.
- (C) She said the response has been great.
- (D) Editors are making a list of words that might go in the dictionary.

2 Which sentence from the article explains WHY the OED wants to include the different words English speakers use?

- (A) Those words might not be used anywhere else.
- (B) People around the world have also come up with their own English words.
- (C) People say them but might not write them down.
- (D) They can be part of how people see themselves, she said.

3 Read the sentence from the section "Words Show Where People Come From."

"The OED aims to cover all types of English," Maier said.

Which word could replace "aims" WITHOUT changing the meaning of the sentence?

- (A) wants
- (B) points
- (C) leads
- (D) offers

4 Read the paragraph from the introduction [paragraphs 1-5].

The Oxford English Dictionary is asking people to help it add new words. The dictionary is called OED for short. The people who put together the dictionary are called editors. They want to find the differences in English around the world.

Fill in the blank. An "editor" is _____.

- (A) someone who uses the dictionary to learn new words
- (B) someone who helps write the dictionary
- (C) someone who can speak English in different ways
- (D) someone who makes up new words

Vocabulary Activity

"Video Gaming Can Be Good for Our Minds"

1. The first heading reads..."Video Games Are Not Rotting Our Brains"

Give a definition for the word "rotting".

What comes to mind when you see the word "rotting"?

Write your own sentence with the word "rotting" in it.

DEFINITION:
WHAT COMES TO MIND:
YOUR SENTENCE:

2. Which sentence is an example of the word "improve"?

The walls in Mary's room were white, and she thought it was a boring color.

OR

Mary thought her room looked much prettier after she painted the walls blue.

3. Think of the meaning of the word "submitted". Is the word being used correctly in the following sentences:

YES OR NO Toby submitted the ball out of the lunch crate to play with at recess.

YES OR NO Jack submitted his homework assignment on time.

YES OR NO I submitted to my dad that I wanted a new puppy.

YES OR NO Before going out to play, I submitted my report on google classroom.

Vocabulary Activity

“Too Much Time Spent Playing Video Games Can Damage Kids’ Brains”

1. Where can someone find the “hippocampus” and what does it do? Also, what happens if it is damaged?

LOCATION: (where?)
FUNCTION: (what does it do?)
RESULT IF DAMAGED: (what happens?)

2. Discuss the difference between the words “violent” and “nonviolent”. Explain how the prefix “non-” changes the meaning of the word violent.

3. Think about the meaning of the word “constantly” and circle the situation in which the word applies.

My friend plays video games all the time. He doesn’t even take a bath or shower.

Once in a while, I go fishing with my uncle and cousins.

Teddy won the spelling bee only one time in seven years.

My parents have never won the lottery.

4. TRUE OR FALSE. If someone is “mindlessly” working on a task, that means they are totally focused on and thinking about what he or she is doing.

Vocabulary Activity

“Translating Aunt Edna”

1. What does the word “obligation” mean as it is used in the following context:

“It is my obligation to increase your vocabulary.”

YOUR DEFINITION:

SYNONYM OR ANOTHER WORD YOU CAN USE IN THE SENTENCE:

USE THE WORD IN YOUR OWN SENTENCE:

2. What does the word effective mean? “That new bug spray did an effective job of keeping the mosquitoes away!”

YOUR DEFINITION:

SYNONYM OR ANOTHER WORD YOU CAN USE IN THE SENTENCE:

USE THE WORD IN YOUR OWN SENTENCE:

3. What kind of line would you draw for the word “increase”? Draw it below. Explain why you drew it like you did.



Vocabulary Activity

“Oxford English Dictionary”

1. Which sentence is an example of the word “includes”?

Jenni ate an apple as a snack because it was healthy and tasted good.

OR

Tammy put an apple in her lunch bag with her sandwich and crackers.

2. How does knowing the meaning of the word “edit” help you figure out what an “editor” is? Explain the job of an editor based on your knowledge of the word edit.

3. Write a sentence for the word “aim” then draw a picture of the word in action.

YOUR SENTENCE: ----- ----- ----- ----- -----	YOUR DRAWING:
--	--

CINQUAIN Poem

"Cinq" means five in French and a cinquain is a poem with five lines. Each line has a specific requirement.

- Line 1: One word subject of the poem (a noun)
- Line 2: Two words to describe the title (adjectives)
- Line 3: Three "ing" words that show action (verbs)
- Line 4: Four-word phrase that expresses a feeling
- Line 5: One word synonym for the subject

Mouse

By Miss Larson

Mouse,
Tiny, fast,
Scurrying, sniffing, squeaking,
Looking for some cheese,
Rodent.



Shoes

By Miss Larson

Shoes,
Comfortable, old,
Walking, running, jumping,
Wear them almost everywhere,
Sneakers.



Haiku Poem

Haiku is an ancient form of poetry that comes from Japan. These three lined poems deal with nature and feelings about the natural world. Each line of haiku is not a complete sentence but is a simple phrase.

Haiku poems must be written following a syllable pattern. The number of words is not as important as the number of "beats" per line.

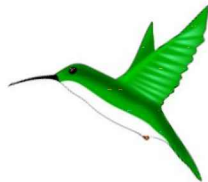
Line 1: Five syllables

Line 2: Seven syllables

Line 3: Five syllables

Hummingbird

By Miss Larson



Chirping in the trees,
In mid-air with beating wings,
Tiny precious bird.



Waves

By Miss Larson

Curling blue water,
Splashing at the sandy shore,
Beautiful ocean.

Mountains

By Miss Larson

Reaching to the sky,
Birds singing in the pine trees,
Home for animals.



My Cinquain Poem

Cinq means five in French and a Cinquain is a poem with five lines. Each line has specific rules.

- Line 1: One word subject of the poem (a noun)
- Line 2: Two words to describe the title (adjectives)
- Line 3: Three "ing" words that show action (verbs)
- Line 4: Four word phrase that expresses a feeling
- Line 5: One word synonym for the subject

Title

Cinquain

Number

Haiku

Alliteration

Shape

Triplets

My Haiku Poem

Haiku is an ancient form of poetry that comes from Japan. These three lined poems deal with nature and feelings about the natural world. Each line of haiku is not a complete sentence but is a simple phrase.

Haiku poems must be written following a syllable pattern. The number of words is not as important as the number of "beats" per line.

Line 1: Five syllables

Line 2: Seven syllables

Line 3: Five syllables

Title

Haiku

Alliteration

Shape

Triplets

A

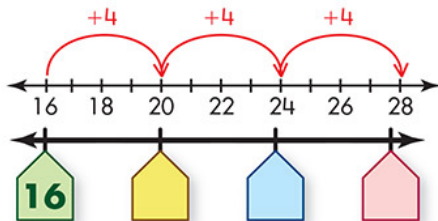
The house numbers on a street follow the rule "Add 4." If the pattern continues, what are the next three house numbers? Describe a feature of the pattern.



You can use a number line to help **make sense** of the problem and find the next three house numbers.

B Use a number line to continue the pattern.

A **rule** is a mathematical phrase that tells how numbers or shapes in a pattern are related. The rule for the house numbers is "Add 4."



The next three house numbers are 20, 24, and 28.

C Describe features of the pattern.

Some patterns have features that are not given in the rule.

16, 20, 24, 28

One of the features of this pattern is all of the house numbers are even numbers.

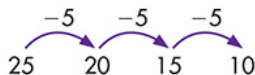
Another feature is all of the house numbers are multiples of 4.




Convince Me! Generalize Can you use the rule "Add 4" to create a different pattern with all odd numbers? Explain.

Another Example!

On another street, the house numbers follow the rule “Subtract 5.” What are the next three house numbers? Describe a feature of the pattern.



The next three house numbers are 20, 15, and 10. All of the house numbers are multiples of 5.



Some patterns have rules using addition, while others have rules using subtraction.


Guided Practice


Do You Understand?

1. **Reasoning** Rudy’s rule is “Add 2.” He started with 4 and wrote the numbers below. Which number does **NOT** belong to Rudy’s pattern? Explain.

4, 6, 8, 9, 10, 12

Do You Know How?

Continue the pattern. Describe a feature of the pattern.

2. Subtract 6

48, 42, 36, 30, 24, _____, _____, _____


Independent Practice


For **3–6**, continue each pattern. Describe a feature of each pattern.

3. Subtract 3: 21, 18, 15, _____, _____

4. Add 7: 4, 11, 18, _____, _____

5. Add 5: 5, 10, 15, _____, _____

6. Add 2: 5, 7, 9, _____, _____

For **7–12**, use the rule to generate each pattern.

7. Rule: Subtract 10

90, _____, _____

8. Rule: Add 11

16, _____, _____

9. Rule: Add 5

96, _____, _____

10. Rule: Add 4

43, _____, _____

11. Rule: Subtract 15

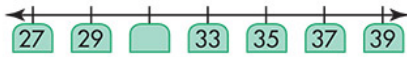
120, _____, _____

12. Rule: Subtract 9

99, _____, _____

*For another example, see Set A on page 759.

13. **Reasoning** Orlando delivers mail. He sees one mailbox that does not have a number. If the numbers are in a pattern, what is the missing number?



14. A bus tour runs 9 times a day, 6 days a week. The bus can carry 30 passengers. Find the greatest number of passengers who can ride the tour bus each week.

15. The year 2005 was the year of the Rooster on the Chinese calendar. The next year of the Rooster will be 2017. The rule is "Add 12." What are the next five years of the Rooster?

The pattern of animals repeats every 12 years.



16. Suppose you were born in the year of the Snake. How old will you be the next time the year of the Snake is celebrated?

17. **A-Z Vocabulary** Define *rule*. Create a number pattern using the rule "Subtract 7."

18. **Higher Order Thinking** Some patterns use both addition and subtraction in their rules. The rule is "Add 3, Subtract 2." Find the next three numbers in the pattern.

1, 4, 2, 5, 3, 6, 4, 7, _____, _____, _____

Assessment

19. Rima used "Subtract 3" as the rule to make a pattern. She started with 60, and wrote the next 6 numbers in her pattern. Which number does **NOT** belong in Rima's pattern?

- (A) 57
- (B) 54
- (C) 45
- (D) 26

Which number is NOT a multiple of 3?



20. Ivan counted all the beans in a jar. If he counted the beans in groups of 7, which list shows the numbers Ivan could have named?

- (A) 7, 14, 21, 24
- (B) 7, 14, 28, 54
- (C) 7, 14, 21, 28
- (D) 14, 24, 34, 44

A

There are 3 leaflets on 1 cloverleaf.
 There are 6 leaflets on 2 cloverleaves.
 There are 9 leaflets on 3 cloverleaves.
 How many leaflets are on 4 cloverleaves?
 How many cloverleaves will have 12 leaflets?

A cloverleaf has 3 leaflets.



You can use a table to create, extend, and identify features of a pattern.

B

How many leaflets are on 4 cloverleaves?

Rule: Multiply by 3

Number of Cloverleaves	Number of Leaflets
1	3
2	6
3	9
4	12

There are 12 leaflets on 4 cloverleaves. The number of leaflets is a multiple of the number of cloverleaves.

C

How many cloverleaves for 12 leaflets?

Rule: Divide by 3

Number of Leaflets	Number of Cloverleaves
3	1
6	2
9	3
12	4

There are 4 cloverleaves for 12 leaflets. The number of cloverleaves is a factor of the number of leaflets.

Convince Me! Reasoning If you know the number of leaflets, how can you find the number of cloverleaves? If you know the number of cloverleaves, how can you find the number of leaflets?

☆ Guided Practice ☆

LESSON 14-2

Do You Understand?

1. **Reasoning** The rule for this table is "Multiply by 4." What number does not belong?

My Marbles	John's Marbles
1	4
2	8
3	12
4	15

Do You Know How?

Complete the table. Describe a feature of the pattern.

2. Rule: Divide by 4

Total Number of Wheels	8	12	16	20
Number of Cars	2	3	4	

☆ Independent Practice ☆

For 3–6, use the rule to complete each table. Describe a feature of each pattern.

3. Rule: Multiply by 8

Number of Spiders	1	2	3	4	5
Number of Legs	8		24	32	

4. Rule: Divide by 5

Number of Fingers	Number of Hands
5	1
10	2
15	
20	

You can multiply or divide to find the patterns in these tables.



5. Rule: Multiply by 16

Number of Books	1	2	3	4
Weight of Books in Ounces	16	32		

6. Rule: Divide by 2

Number of Shoes	12	14	16	18
Number of Pairs	6	7		

*For another example, see Set B on page 759.

7. The table shows how much money Joe makes babysitting. How much money will Joe make when he babysits for 6 hours?

Rule: Multiply by 7

Hours of Babysitting	Amount Earned
3	\$21
4	\$28
5	\$35
6	

8. The table shows the total number of pounds of potatoes for different numbers of bags. How many bags does it take to hold 96 pounds of potatoes?

Rule: Divide by 8

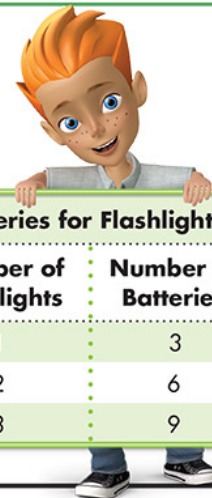
Number of Pounds	Number of Bags
72	9
80	10
88	11
96	

9. **Number Sense** What is the greatest number you can make using each of the digits 1, 7, 0 and 6 once?

10. **Algebra** A penguin can swim 11 miles per hour. At this speed, how far can it swim in 13 hours? Use s as a variable. Write and solve an equation.

For 11–12, the rule is “Multiply by 3.”

11. **Reasoning** Using the rule, how many batteries do 8 flashlights need? 10 flashlights?
12. **Higher Order Thinking** How many more batteries do 6 flashlights need than 4 flashlights? Explain.



Batteries for Flashlights	
Number of Flashlights	Number of Batteries
1	3
2	6
3	9

Assessment

13. There are 6 rolls in each package. Use the rule “Divide by 6” to show the relationship between the number of rolls and the number of packages. Use each digit from the box once to complete the table.

Number of Rolls	522	528	534	540	546	552
Number of Packages	□□	88	89	□□	9□	9□

0	1
2	7
8	9

A

Rashad is making a repeating pattern for the rule "Triangle, Square, Trapezoid." What will be the 49th shape in the pattern?

A **repeating pattern** is made up of shapes or numbers that form a part that repeats.



B Look for Features of the Repeating Pattern



The trapezoid is the 3rd, 6th, and 9th shape in the pattern. The positions of the trapezoids are multiples of 3.



The triangle is the 1st, 4th, and 7th shape in the pattern. The positions of the triangles are 1 more than a multiple of 3.



The square is the 2nd, 5th, and 8th shape in the pattern. The positions of the squares are 1 less than a multiple of 3.

C Use the Repeating Pattern to Solve

When you divide 49 by 3, the quotient is 16 R1. The pattern repeats 16 times. The 1st shape in the repeating pattern, a triangle, then appears.

$$\begin{array}{r} 16R1 \\ 3 \overline{)49} \end{array}$$

You divide by 3 because there are 3 items in the repeating pattern.

49 is one more than a multiple of 3.

The 49th shape is a triangle.



Convince Me! **Be Precise** Suppose the rule is "Square, Triangle, Square, Trapezoid" in a repeating pattern. What is the 26th shape in the pattern? Describe features of the repeating pattern. Be precise in your description.

Another Example!

Write the next three numbers in the repeating pattern.
Then name the 100th number in the pattern.

Rule: 1, 3, 5, 7

1, 3, 5, 7, 1, 3, 5, 7, 1, 3, 5, 7, , , ...

There are 4 items in the repeating pattern. To find the 100th number, divide by 4. The pattern repeats 25 times. The 100th number is 7.

$$\begin{array}{r} 25 \\ 4 \overline{)100} \\ \underline{-100} \\ 0 \end{array}$$

LESSON 14-3

A repeating pattern can be made up of shapes or numbers.




☆ Guided Practice *

Do You Understand?

1. **Look for Relationships** In the "Triangle, Square, Trapezoid" example on the previous page, what will be the 48th shape? the 50th shape? Explain.


Do You Know How?

2. What is the 20th shape? The rule is "Triangle, Circle, Circle."

3. Write the next three numbers. The rule is "9, 2, 7, 6."
 9, 2, 7, 6, 9, 2, 7, 6, , ,

☆ Independent Practice ☆

For 4–7, draw or write the next three items to continue each repeating pattern.


4. The rule is "Square, Triangle, Square."


5. The rule is "Up, Down, Left, Right."


6. The rule is "1, 1, 2."
 1, 1, 2, 1, 1, 2, , , ...

7. The rule is "5, 7, 4, 8."
 5, 7, 4, 8, 5, 7, 4, 8, 5, 7, , , ...

For 8–9, determine the given shape or number in each repeating pattern.

8. The rule is "Tree, Apple, Apple." What is the 19th shape?


9. The rule is "1, 2." What is the 42nd number?
 1, 2, 1, 2, 1, 2, ...

*For another example, see Set C on page 760.

10. Create a repeating pattern using the rule "Triangle, Square, Square."

11. **Math and Science** Margot measured the distance for 6 wavelengths of visible light as 2,400 nanometers. What is the distance for 1 wavelength?

12. **Look for Relationships** Hilda is making a repeating pattern with the shapes below. The rule is "Heart, Square, Triangle." If Hilda continues the pattern, what will be the 11th shape?



13. **Look for Relationships** Josie puts beads on a string in a repeating pattern. The rule is "Blue, Green, Yellow, Orange." There are 88 beads on her string. How many times did Josie repeat her pattern?

14. How many more years passed between the first steam locomotive and the gasoline-powered automobile than between the gasoline-powered automobile and the first diesel train in the U.S.?

Year	Invention
1804	Steam Locomotive
1885	Gasoline-powered Automobile
1912	Diesel Train in U.S.

15. **Reasoning** Louisa used the rule "Blue, Green, Green, Green" to make a bracelet with a repeating pattern. She used 18 green beads. How many beads did Louisa use to make the bracelet? How many beads were **NOT** green?

16. **Higher Order Thinking** Marcus is using shapes to make a repeating pattern. He has twice as many circles as squares. Make a repeating pattern that follows this rule.

Assessment

17. Which rules give a repeating pattern that has a square as the 15th shape? Select all that apply.

- Square, Circle
- Circle, Square, Triangle
- Square, Circle, Triangle
- Circle, Triangle, Square
- Trapezoid, Circle, Square

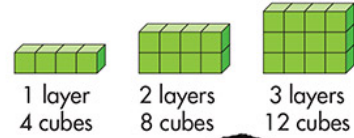
18. Which rules give a repeating pattern that has a 7 as the 15th number? Select all that apply.

- 1, 7
- 1, 7, 9
- 1, 9, 7
- 1, 7, 7
- 7, 1, 9

A

Alisa made three walls with cubes. She recorded her pattern. If she continues the pattern, how many cubes will be in a 10-layer wall? a 100-layer wall?

Rule: Each layer has 4 cubes.



What do you need to do to find the number of cubes in a 10-layer and 100-layer wall?

I need to continue the pattern using the rule and analyze the pattern to find features not stated in the rule itself.



Here's my thinking.

B

How can I make use of structure to solve this problem?

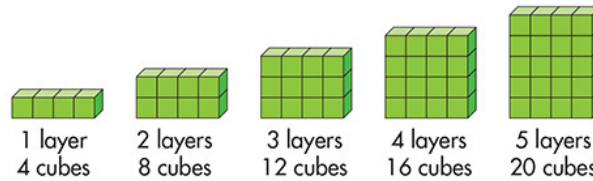
I can

- look for and describe patterns in three-dimensional shapes.
- use the rule that describes how objects or values in a pattern are related.
- use features of the pattern not stated in the rule to generate or extend the pattern.

C

Make a table and look for patterns.

Number of Layers	1	2	3	4	5
Number of Cubes	4	8	12	16	20



There are 4 cubes in each layer. Multiply the number of layers by 4 to calculate the number of cubes.

A 10-layer wall contains $10 \times 4 = 40$ cubes.

A 100-layer wall contains $100 \times 4 = 400$ cubes.

Convince Me! **Look For Relationships** How could you use multiples to describe Alisa's pattern?

☆ Guided Practice ☆

LESSON 14-4

Use Structure

Leah arranged triangular tiles in a pattern like the one shown. She used the rule “Multiply the number of rows by itself to get the number of small triangles.” How many small triangles would be in the pattern if there were 10 rows?

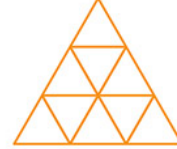
1 row
 $1 \times 1 = 1$



2 rows
 $2 \times 2 = 4$



3 rows
 $3 \times 3 = 9$



1. Complete the table to help describe the pattern.

Number of Rows	1	2	3	4	5
Number of Small Triangles	1	4	9		

When you look for **relationships**, you use features of the pattern not stated in the rule to extend the pattern.



2. Describe the pattern another way.
3. How many triangles would be in 10 rows?

☆ Independent Practice ☆

Look for Relationships

Alan built the towers shown using the rule “Each story has 2 blocks.” How many blocks will a 10-story tower have? Use Exercises 4–6 to answer the question.



4. Complete the table to help describe the pattern.

Number of Stories	1	2	3	4	5
Number of Blocks	2	4	6		

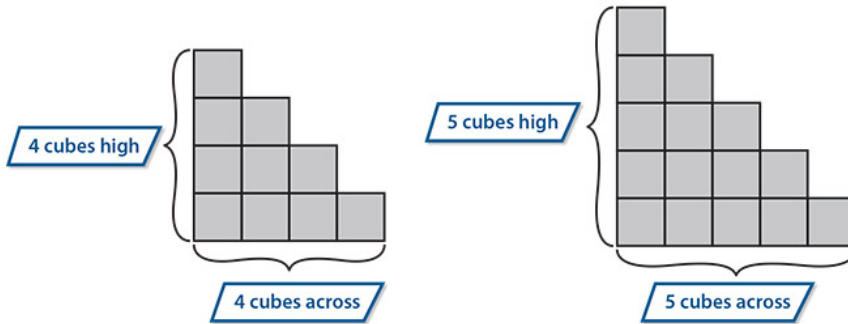
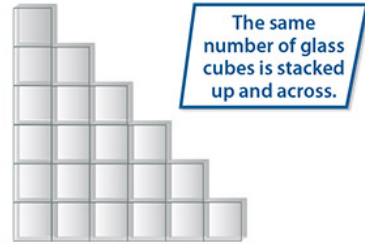
5. What is another way to describe the pattern that is not described by the rule?
6. How many blocks are in a 10-story tower? Explain.

*For another example, see Set D on page 760.

Performance Assessment

Glass Stairs

An art gallery staircase is built using glass cubes. The diagram below shows 4 steps are 4 cubes high and 4 cubes across. Five steps are 5 cubes high and 5 cubes across. How many glass cubes are used to make 7 steps? Use Exercises 7–10 to answer the question.



7. **Make Sense and Persevere** What do you know, and what do you need to find?

When you look for relationships, you use the rule that describes how objects or values in a pattern are related.

8. **Reasoning** Complete the table.

Cubes Up or Across	2	3	4	5	6
Total Cubes Needed	3	6			

9. **Look For Relationships** What pattern can you determine from the table?

10. **Reasoning** How many cubes are needed for 7 steps? Write and solve an equation.



Name _____

1. Charlene and Luke play a game with scoring tags as shown below. They follow the rule "Add 5."



Part A

What number belongs on the front of the blank scoring tag? Explain.

Part B

Describe two features of the pattern.

2. There are 8 juice boxes in each package. Two packages contain 16 juice boxes. The rule for this pattern is "Multiply by 8." Draw lines to connect the number of juice boxes with the number of packages.

4 packages	48 boxes
20 packages	32 boxes
6 packages	120 boxes
15 packages	160 boxes

3. Use the rule "Multiply by 10" to continue the pattern.

Number of Dollars	4	6	7	9
Number of Dimes	40	60	70	

4. Which statement is true? Use the table and rule in Exercise 3.
- (A) The number of dollars is always more than the number of dimes.
 - (B) The number of dimes will always be an even number.
 - (C) The number of dollars must be even to follow the rule.
 - (D) The number of dimes will always be less than the number of dollars.

5. Choose the correct word from the box to complete each statement that describes the table in Exercise 3.

multiple	factor
----------	--------

The number of dollars is a _____ of the number of dimes.

The number of dimes is a _____ of the number of dollars.

6. Choose numbers from the box to continue the pattern for the rule "Multiply by 2." Use each number from the box once.

8, 16, 32, _____, _____, ...

1	2	4	6	8
---	---	---	---	---

7. The rule for the repeating pattern is "2, 8, 2, 6, 3." Write the next three numbers in the pattern. Then tell what will be the 23rd number in the pattern. Explain.

2, 8, 2, 6, 3, 2, 8, 2, _____, _____, _____

8. Marti wrote different patterns for the rule "Add 7." Which patterns could Marti have written?

8a. 1, 7, 14, 21, 28 Yes No

8b. 7, 14, 21, 28, 35 Yes No

8c. 3, 10, 17, 24, 31 Yes No

8d. 70, 63, 56, 49, 42 Yes No

9. Select all the true statements. The rule is "Oval, Star, Tree, Circle."



- The next shape in the repeating pattern is an oval.
- The tree is the 3rd, 7th, 11th, etc. shape in the repeating pattern.
- The 15th shape in the repeating pattern is the circle.
- The circle only repeats once in the repeating pattern.
- The 10th shape in the repeating pattern is the star.

10. The table shows the different numbers of bracelets formed by different numbers of links. The rule is "Divide by 9."

Links	36	45	81	108
Bracelets	4	5	<i>b</i>	12

How many bracelets can be formed with 81 links?

- (A) 5 bracelets
- (B) 8 bracelets
- (C) 9 bracelets
- (D) 90 bracelets

11. Mario lives in an apartment complex where all the building numbers are consecutive multiples of 6. If the first number in the complex is 6, what are the next three building numbers? Explain.

12. The rule is "Subtract 4." What are the next three numbers in the pattern? Describe two features of the pattern.

48, 44, 40, 36, 32, 28, ...

Essential Question

What Are Some Common Geometric Terms?

LESSON 15-1

A

Point, line, line segment, ray, right angle, acute angle, obtuse angle, and straight angle are common geometric terms.



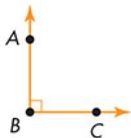
Lines and parts of lines are named for their points. A ray is named with its endpoint first.

Geometric Term	Example	Label	What You Say
A point is an exact location in space.		Point Z	Point Z
A line is a straight path of points that goes on and on in opposite directions.		\overleftrightarrow{AB}	Line AB
A line segment is a part of a line with two endpoints.		\overline{GR}	Line Segment GR
A ray is a part of a line that has one endpoint and continues on forever in one direction.		\overrightarrow{NO}	Ray NO

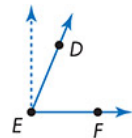
B

An angle is formed by two rays that have the same endpoint.

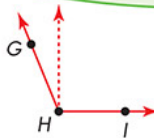
Angles are named with 3 letters. The shared endpoint of the rays is the center letter. The other letters represent points from each ray.



$\angle ABC$ is a right angle. A **right angle** forms a square corner.



$\angle DEF$ is an acute angle. An **acute angle** is open less than a right angle.



$\angle GHI$ is an obtuse angle. An **obtuse angle** is open more than a right angle but less than a straight angle.



$\angle JKL$ is a straight angle. A **straight angle** forms a straight line.

Convince Me! **Look for Relationships** Complete each figure to show the given angle.

Obtuse angle

 Straight angle

 Acute angle

 Right angle

★ Guided Practice ★

LESSON 15-1

Do You Understand?

1. **Be Precise** What geometric term describes a part of a line that has one endpoint? Draw an example.
2. What geometric term describes a part of a line that has two endpoints? Draw an example.
3. Which geometric term describes an angle that forms a square corner? Draw an example.

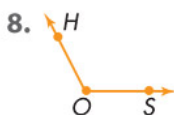
Do You Know How?

For 4–7, use geometric terms to describe what is shown.



★ Independent Practice ★

For 8–11, use geometric terms to describe what is shown.

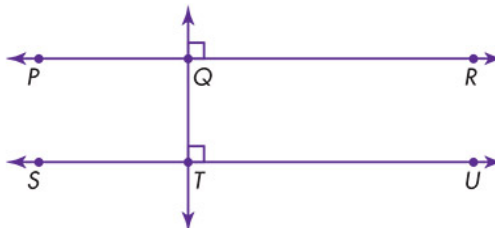


For 12–14, use the diagram at the right.

12. Name four line segments.

13. Name four rays.

14. Name 2 right angles.



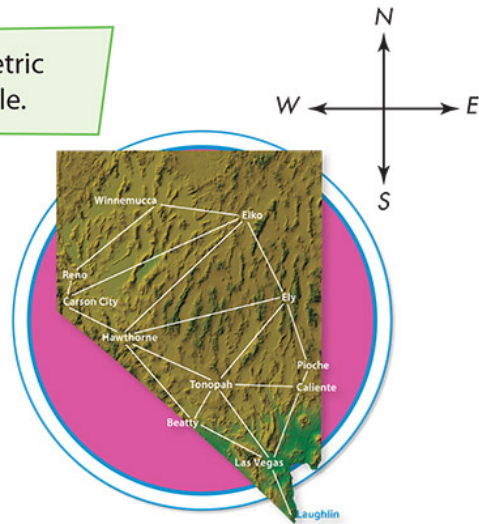
*For another example, see Set A on page 809.

Problem Solving

LESSON 15-1

For 15–17, use the map of Nevada. Write the geometric term that best fits each description. Draw an example.

- Be Precise** The route between 2 cities.
- The cities
- Where the north and west borders meet

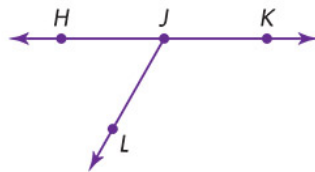


- A-Z Vocabulary** Write a definition for *right angle*. Draw a right angle. Give 3 examples of right angles in the classroom.

- Higher Order Thinking** Nina says she can make a right angle with an acute angle and an obtuse angle that have a common ray. Is Nina correct? Draw a picture and explain.

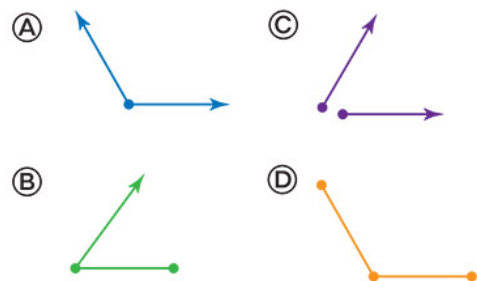
Assessment

- Which geometric term describes $\angle HJK$?



- (A) Acute (C) Right
(B) Obtuse (D) Straight

- Lisa drew 2 rays that share an endpoint. Which of the following is Lisa's drawing?



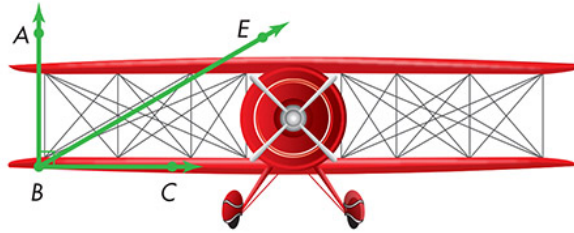
Essential Question

How Can You Add and Subtract to Find Unknown Angle Measures?

LESSON 15-5

A

Elinor designs wings for biplanes. First she draws a right angle, $\angle ABC$. Then she draws \overline{BE} . She finds $\angle EBC$ measures 30° . How can Elinor find the measure of $\angle ABE$ without using a protractor?

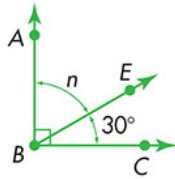


$\angle ABC$ is decomposed into two non-overlapping parts.

B

$\angle EBC$ and $\angle ABE$ do not overlap, so the measure of right $\angle ABC$ is equal to the sum of the measures of its parts.

The measure of $\angle ABC$ equals the measure of $\angle ABE$ plus the measure of $\angle EBC$.



C

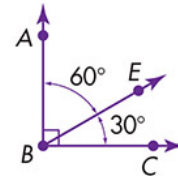
Write an equation to determine the missing angle measure.

$$n + 30^\circ = 90^\circ$$

Solve the equation.

$$n = 90^\circ - 30^\circ$$

$$n = 60^\circ$$

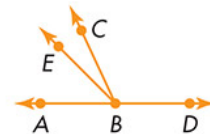


All right angles measure 90° .



The measure of $\angle ABE$ is 60° .

Convince Me! **Make Sense and Persevere** $\angle ABD$ is a straight angle. What is the measure of $\angle ABE$ if the measure of $\angle DBC$ is 115° and the measure of $\angle CBE$ is 20° ? How did you decide? Write and solve an equation.



★ Guided Practice ★

Do You Understand?

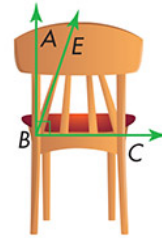
- Model with Math** Use the information below to draw and label a diagram.
 $\angle PQR$ measures 45° .
 $\angle RQS$ measures 40° .
 $\angle PQR$ and $\angle RQS$ do not overlap.
 Write and solve an equation to find the measure of $\angle PQS$.

Do You Know How?

LESSON 15-5

For 2–3, use the diagram to the right of each exercise. Write and solve an equation to find the missing angle measure.

- What is the measure of $\angle EBC$ if $\angle ABE$ measures 20° ?



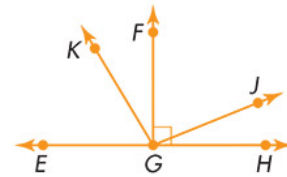
- What is the measure of $\angle AEB$ if $\angle CEB$ measures 68° ?



★ Independent Practice ★

For 4–7, use the diagrams to the right. Write and solve an addition or subtraction equation to find the missing angle measure.

- What is the measure of $\angle FGJ$ if $\angle JGH$ measures 22° ?
- What is the measure of $\angle KGF$ if $\angle EGK$ measures 59° ?
- Use the angle measures you know to write an equation to find the angle measure of $\angle EGH$. What kind of angle is $\angle EGH$?



- Which two non-overlapping angles that share a ray make an obtuse angle? Use addition to explain.

*For another example, see Set E on page 810.

Problem Solving

LESSON 15-5

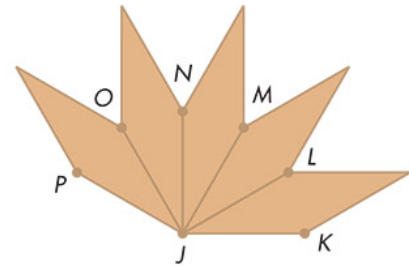
8. Shane says a straight angle always has 180° degrees. Is Shane correct? Explain.

9. **Model with Math** Talla earns 85¢ for cans she recycles. If she gets a nickel for each can, how many cans does Talla recycle? Draw a bar diagram to represent how to solve the problem.

10. Alex draws an angle that measures 110° . He then draws a ray that divides the angle into 2 equal parts. What is the measure of each smaller angle?

11. Six angles share a vertex. Each of the angles has the same measure. The sum of the measures of the angles is 330° . What is the measure of one angle?

12. **Higher Order Thinking** Li uses pattern blocks to make a design. He puts 5 pattern blocks together, as shown in the diagram. The measure of $\angle LJK$ is 30° . Name all the 60° angles shown that have point J as a vertex.



Assessment

13. Carla drew two acute nonoverlapping angles that share a ray and labeled them $\angle JLK$ and $\angle KLM$. The two angles have different measures. Carla says $\angle JLM$ is greater than a right angle.



An acute angle is open less than a right angle.

Part A

Is it possible for Carla to be correct? Write to explain.

Part B

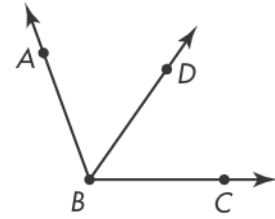
Write an equation showing one possible sum for Carla's angles.

AZ Vocabulary

1. An **angle** is formed by two rays that have the same endpoint. Two angles can share a common ray.

$\angle ABD$ and $\angle DBC$ share a common ray.

Name the common ray. _____



2. Find the measure of $\angle KJM$.

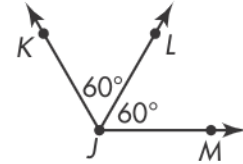
$\angle KJL$ and $\angle LJM$ do not overlap, so the measure of $\angle KJM$ is equal to the sum of its parts.

Write and solve an equation.

measure of $\angle KJM$ = measure of $\angle KJL$ + measure of $\angle LJM$

measure of $\angle KJM$ = 60° + _____

measure of $\angle KJM$ = _____



3. The measure of $\angle AKC$ is 70° . Find the measure of $\angle AKB$.

$\angle AKC$ is decomposed into two non-overlapping angles, $\angle AKB$ and $\angle BKC$.

Write an equation.

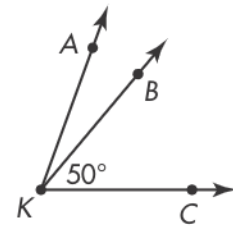
measure of $\angle AKB$ + measure of $\angle BKC$ = measure of $\angle AKC$

measure of $\angle AKB$ + 50° = _____

Find the missing angle measure.

measure of $\angle AKB$ = $70^\circ - 50^\circ$

measure of $\angle AKB$ = _____

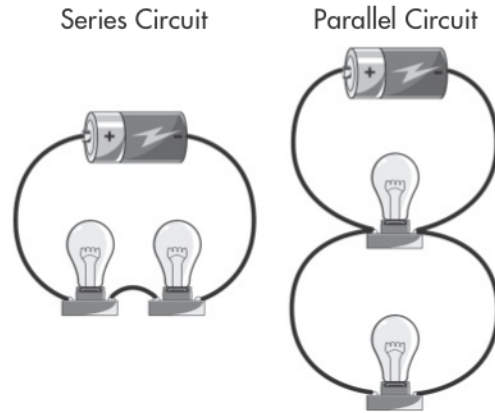


On the Back!

4. Two non-overlapping angles that share a common ray form a right angle. One of the angles has a measure of 55° . What is the measure of the other angle?

Electric Circuits

Did You Know? A flashlight, an electric stove, and the engine in a car all involve electric circuits. For these items to work, electricity has to flow through a circuit. There are two types of circuits: series and parallel. A series circuit is a single-loop circuit. A parallel circuit has multiple loops, allowing the electrical current to split in different paths.



During a science experiment, a class tested various circuits. The diagram shows one of the circuits the class tested.

- 1 $\angle ACE$ is a right angle. What is the measure of $\angle BCE$? Write and solve an equation.

- 2 The measure of $\angle CBD$ is 65° . What is the measure of $\angle ABD$? Write and solve an equation.

- 3 **Extension** Classify each of the angles as straight, obtuse, right, or acute.

$\angle ABC$ is an _____ angle.

$\angle FED$ is an _____ angle.

$\angle CBD$ is an _____ angle.

$\angle DEC$ is an _____ angle.

$\angle BDE$ is an _____ angle.

$\angle ECB$ is an _____ angle.

$\angle EDF$ is an _____ angle.

$\angle BCA$ is an _____ angle.

$\angle ACE$ is a _____ angle.

$\angle FEC$ is a _____ angle.

