FIRSTLINE SCHOOLS
EDUCATION FOR LIFE

DISTANCE LEARNING FOR FIRSTLINE STUDENTS

PACKET #2

Start Date: Monday, March 30, 2020

GRADE:

K 1 2 3 4 5 6 7 8

CONTENT INCLUDED:

ELA MATH SCIENCE SOCIAL STUDIES

FIRSTLINE SCHOOLS

MS ENGLISH LANGUAGE ARTS

DISTANCE LEARNING MATERIALS

2020

Read for Deeper Meaning:

When reading fiction...

- Write a **gist** for each section or stanza
- Describe the **setting**: Where and when does the story take place? How does the setting influence the characters?
- Name the **conflict or problem:** who wants what? And what is getting in their way?
- Describe the **point of view:**
  - 1st - "I" "We" "Our"
  - 2nd- "You" "Your"
  - 3rd- "He" "She" "They"
  - Is it an all-knowing "omniscient" point of view or a limited point of view?
- Define the **perspective:** How is the narrator/ character connected to the events? How do they feel about them?
- Identify how the **characters change** over the course of the story: How did the events of the story affect the characters?
- Identify the **theme**

LITERARY ANALYSIS TASK:

Students read two fiction texts on a similar topic (which could be a story or poem) and compare the texts approach-which could include structure, point of view, setting or other literary elements.

Criteria for Success

1. *Answers the prompt with a clear claim*
2. *Gives reasons to support the claim*
3. *Includes evidence from all texts referenced in the prompt*
4. *Explains or interprets evidences' connection to reasons and claim*

GEORGES AND THE JEWELS

Today you will analyze a passage from *The Georges and the Jewels* and a passage from *Black Beauty: The Autobiography of a Horse*. As you read these passages, you will gather information and answer questions about how the authors develop each narrator's point of view so you can write an essay.

Read the passage from the novel *The Georges and the Jewels*. Then answer the questions.

from *The Georges and the Jewels*

by Jane Smiley

1 Sometimes when you fall off your horse, you just don't want to get right back on. Let's say he started bucking and you did all the things you knew to do, like pull his head up from between his knees and make him go forward, then use a pulley rein on the left to stop him. Most horses would settle at that point and come down to a walk. Then you could turn him again and trot off—it's always harder for the horse to buck at the trot than at the lope. But if, right when you let up on the reins, your horse put his head between his knees again and took off bucking, kicking higher and higher until he finally dropped you and went tearing off to the other end of the ring, well, you might lie there, as I did, with the wind knocked out of you and think about how nice it would be not to get back on, because that horse is just dedicated to bucking you off.

2 So I did lie there, looking up at the branches of the oak tree that grew beside the ring, and I did wait for Daddy to come trotting over with that horse by the bridle, and I did stare up at both their faces, the face of that horse flicking his ears back and forth and snorting a little bit, and the face of my father, red-cheeked and blue-eyed, and I did listen to him say, "Abby? You okay, honey? Sure you are. I saw you bounce! Get up, now."

3 I sighed.

4 "How am I going to tell those folks who are looking to buy these horses that a little girl can ride them, if you don't get up and ride them?"

5 I sat up. I said, "I don't know, Daddy." My elbow hurt, but not too badly. Otherwise I was okay.

6 "Well, then."

7 I stood up, and he brushed off the back of my jeans. Then he tossed me on the horse again.

8 Some horses buck you off. Some horses spook you off—they see something scary and drop a shoulder and spin and run away. Some horses stop all of a sudden, and there you are, head over heels and sitting on the ground. I had a horse rear so high once that I just slid down over her tail and landed in the grass easy as you please, watching her run back to the barn. I started riding when I was three. I started training horses for my dad when I was eight. I wasn't the only one—my brother, Danny, was thirteen at the time, and he did most of the riding (Kid's Horse for Sale), but I'm the only one now.

GO ON ▶

9 Which is not to say that there aren't good horses and fun horses. I ride plenty of those, too. But they don't last, because Daddy turns those over fast. I had one a year ago, a sweet bay mare. We got her because her owner had died and Daddy picked her up for a song from the bank. I rode her every day, and she never put a foot wrong. Her lope was as easy as flying. One of the days she was with us, I had a twenty-four-hour virus, so when I went out to ride, I tacked her up and took her down to the crick at the bottom of the pasture, out of sight of the house.

10 I knew Daddy had to go into town and would be gone for the afternoon, so when I got down there, I just took off the saddle and hung it over a tree limb, and the bridle, too, and I lay down in the grass and fell asleep. I knew she would graze, and she did for a while, I suppose. But when I woke up (and feeling much better, thank you), there she was, curled up next to me like a dog, kind of pressed against me but sweet and large and soft. I lay there feeling how warm she was and smelling her fragrance and I thought, I never heard of this before. I don't know why she did that, but now when Daddy tells me that horses only know two things, the carrot and the stick, and not to fill my head with silly ideas about them, I just remember that mare (she had a star shaped like a triangle and a little snip down by her left nostril). We sold her for a nice piece of change within a month, and I wish I knew where she was.

GO ON ▶

1. **Part A**

What is the meaning of **tearing** as it is used in paragraph 1 of the passage from *The Georges and the Jewels*?

Ⓐ ripping

Ⓑ pulling

Ⓒ speeding

Ⓓ crying

2. **Part B**

Which phrase in paragraph 1 helps the reader understand the meaning of **tearing**?

Ⓐ ". . . let up on the reins . . ."

Ⓑ ". . . put his head between his knees . . ."

Ⓒ ". . . off to the other end of the ring . . ."

Ⓓ ". . . kicking higher and higher . . ."

3. **Part A**

In the passage from *The Georges and the Jewels*, how do the father's actions affect the narrator's life?

Ⓐ The father's kindness causes him to carry the narrator into the house after she falls off the horse.

Ⓑ The father's love of horses causes him to show the narrator how beautiful the animals are when they walk.

Ⓒ The father's desire to sell horses causes him to quickly place the narrator back on the horse after she falls.

Ⓓ The father's expectation of obedience causes him to require the narrator to keep trying.

4. **Part B**

Choose evidence from the passage from *The Georges and the Jewels* that best supports the answer to Part A.

Ⓐ ". . . and I did wait for Daddy to come trotting over with that horse . . . ." (paragraph 2)

Ⓑ ". . . and the face of my father, red-cheeked and blue-eyed . . ." (paragraph 2)

Ⓒ " 'Abby? You okay, honey?' " (paragraph 2)

Ⓓ ". . . he tossed me on the horse again." (paragraph 7)

GO ON ▶

5. **Part A**

In the passage from *The Georges and the Jewels*, how are the father's and narrator's points of view toward horses different?

Ⓐ The father thinks horses are easy to tame, while the narrator believes horses are dangerous animals.

Ⓑ The father believes horses only respond to punishment and reward, while the narrator thinks horses have feelings.

Ⓒ The father thinks only boys should ride horses, while the narrator thinks girls should be able to ride them, too.

Ⓓ The father wants his daughter to ride horses more, but the narrator worries about getting hurt.

6. **Part B**

Which **two** pieces of evidence **best** support the answer to Part A?

Ⓐ "Sometimes when you fall off your horse, you just don't want to get right back on." (paragraph 1)

Ⓑ ". . . my brother, Danny, was thirteen at the time, and he did most of the riding. . . ." (paragraph 8)

Ⓒ "Which is not to say that there aren't good horses and fun horses." (paragraph 9)

Ⓓ "Her lope was as easy as flying." (paragraph 9)

Ⓔ ". . . there she was, curled up next to me like a dog, kind of pressed against me but sweet and large and soft." (paragraph 10)

Ⓕ ". . . Daddy tells me that horses only know two things, the carrot and the stick, and not to fill my head with silly ideas about them. . . ." (paragraph 10)

GO ON ▶

BLACK BEAUTY: THE AUTOBIOGRAPHY OF A HORSE

Read the passage from the novel *Black Beauty: The Autobiography of a Horse*. Then answer the questions.

from *Black Beauty: The Autobiography of a Horse*

by Anna Sewell

1 Every one may not know what breaking in is, therefore I will describe it. It means to teach a horse to wear a saddle and bridle, and to carry on his back a man, woman or child; to go just the way they wish, and to go quietly. Besides this he has to learn to wear a collar, a crupper, and a breeching, and to stand still while they are put on; then to have a cart or chaise fixed behind, so that he cannot walk or trot without dragging it after him; and he must go fast or slow, just as his driver wishes. He must never start at what he sees, nor speak to other horses, nor bite, nor kick, nor have any will of his own; but always do his master's will, even though he may be very tired or hungry; but the worst of all is, when his harness is once on, he may neither jump for joy nor lie down for weariness. So you see this breaking in is a great thing.

2 I had of course been used to a halter and a headstall, and to be led about in the fields and lanes quietly, but now I was to have a bit and bridle; my master gave me some oats as usual, and after a good deal of coaxing he got the bit into my mouth, and the bridle fixed, but it was a nasty thing! Those who have never had a bit in their mouths cannot think how bad it feels; a great piece of cold hard steel as thick as a man's finger to be pushed into one's mouth, between one's teeth, and over one's tongue, with the ends coming out at the corner of your mouth, and held fast there by straps over your head, under your throat, round your nose, and under your chin; so that no way in the world can you get rid of the nasty hard thing; it is very bad! Yes, very bad! At least I thought so; but I knew my mother always wore one when she went out, and all horses did when they were grown up; and so, what with the nice oats, and what with my master's pats, kind words, and gentle ways, I got to wear my bit and bridle.

3 Next came the saddle, but that was not half so bad; my master put it on my back very gently, while old Daniel held my head; he then made the girths fast under my body, patting and talking to me all the time; then I had a few oats, then a little leading about; and this he did every day till I began to look for the oats and the saddle. At length, one morning, my master got on my back and rode me round the meadow on the soft grass. It certainly did feel queer; but I must say I felt rather proud to carry my master, and as he continued to ride me a little every day, I soon became accustomed to it.

Black Beauty: The Autobiography of a Horse—Public Domain

GO ON ▶

1. **Part A**

As used in paragraph 2 of the passage from *Black Beauty: The Autobiography of a Horse*, what is the meaning of the word **fast**?

Ⓐ cheerfully

Ⓑ securely

Ⓒ carefully

Ⓓ quickly

2. **Part B**

As used in paragraph 2, which phrase supports the meaning of the word **fast**?

Ⓐ ". . . cannot think how bad it feels . . ."

Ⓑ ". . . no way in the world can you get rid of the nasty hard thing . . ."

Ⓒ ". . . I knew my mother always wore one when she went out . . ."

Ⓓ ". . . and what with my master's pats, kind words, and gentle ways . . ."

GO ON ▶

3. **Part A**

How does the horse feel about wearing riding gear in the passage from *Black Beauty: The Autobiography of a Horse*?

Ⓐ The horse dislikes wearing the gear and will never get used to wearing it.

Ⓑ The horse is displeased with wearing the gear but learns to accept it.

Ⓒ The horse believes the saddle is the worst part of wearing the gear.

Ⓓ The horse wishes to be like his mother and enjoy wearing the gear.

4. **Part B**

Which **two** statements support the correct answer to Part A?

Ⓐ Being broken in means to carry a man, woman, or child on his back.

Ⓑ A bit is placed in the horse's mouth and is held by a strap over the head.

Ⓒ The horse's mother always wore a bit when she went out.

Ⓓ The horse complains about how uncomfortable the bit feels in his mouth.

Ⓔ The master rides the horse around a meadow.

Ⓕ The horse enjoys the attention he receives from wearing his saddle.

GO ON ▶

You have read passages from the novels *The Georges and the Jewels* and *Black Beauty: The Autobiography of a Horse*. Both were written in the first person point of view.

Write an essay in which you compare the way the authors use first person point of view to develop the characters.

Be sure to cite specific examples from **both** passages.

GO ON ▶

GO ON ▶


STOP

RESEARCH TASK:

Students read 2-3 non fiction texts and write an informative essay in which they use evidence from all of the texts provided.

Criteria for Success

1. *Answers the prompt with a clear claim*
2. *Gives reasons to support the claim*
3. *Includes evidence from all texts referenced in the prompt*
4. *Explains or interprets evidences' connection to reasons and claim*

Read for Deeper Meaning:

When reading non fiction...

- Write a gist for each section of the passages
- Describe the point of view: Who is the author? How are they connected to the topic? How does this influence what they include?
- Name the structure: cause & effect? chronological? description? compare/ contrast? problem/solution?
- Identify the different types of evidence used: Quotations from experts, statistics, personal anecdotes (stories), facts
- Write a central idea

RESEARCH TASK:

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KLONDIKE GOLD RUSH

Today you will research the gold rush in the late 1800s. You will read the article "Klondike Gold Rush." Then you will read a passage from *A Woman Who Went to Alaska* and read a transcript from the video *City of Gold.* As you review these sources, you will gather information and answer questions about the authors' points of view and the way they present information so you can write an essay.

Read the article "Klondike Gold Rush." Then answer the questions.

Klondike Gold Rush

Yukon Territory, 1897

1 The Klondike gold rush began in July of 1897 when two ships docked in San Francisco and Seattle carrying miners returning from the Yukon with bags of gold. The press was alerted, and papers carried the story to the masses.

2 Soon, miners of all shapes and sizes, called "stampeders," were on their way to the gold fields. Within six months, approximately 100,000 gold-seekers set off for the Yukon. Only 30,000 completed the trip.

3 Most stampeders knew little or nothing about where they were going, so pamphlets were available to help them on their way. Many of the pamphlets contained little or no real information and made outrageous claims of wealth to be had by everyone. Outfitters sprang up overnight that were happy to sell the stampeders whatever they needed to get started. This included food; clothing; tools; and camping, mining, and transportation equipment. Helping the outfitters in this regard were the Northwest Mounted Police who required all stampeders to have one year's supply of goods before they allowed them across the border into Canada. This was roughly one ton of goods per person. Towns such as Seattle made fortunes outfitting the miners.

4 The easiest and most expensive route to the gold fields was by boat upstream from the mouth of the Yukon in western Alaska. The most difficult route was the "All Canadian Route" from Edmonton and overland through the wilderness.

5 The most common route taken by the stampeders to reach the fields was by boat from the west coast of the continental U.S. to Skagway in Alaska, over the Chilkoot Pass or White Pass to the Yukon River at Whitehorse and then by boat 500 miles to Dawson City.

6 The Chilkoot Pass trail was steep and hazardous. Rising 1,000 feet in the last 1/2 mile, it was known as the "golden staircase": 1,500 steps carved out of snow and ice worked their way to the top of the pass. Too steep for packhorses, stampeders had to "cache" their goods, moving their equipment piecemeal up the mountain. Stampeders who gave up often did it here, discarding their unneeded equipment on the side of the trail.

7 Conditions on the White Pass trail were even more horrendous. Steep, narrow, and slick, over 3,000 pack animals died on the trail, causing it to be dubbed the "dead horse trail."

GO ON ▶

8 Those who made it across the passes found themselves at Bennett Lake. Here, boats had to be built to run the final 500 miles down the Yukon River to the gold fields. A three-week trip, the miners had to survive many sets of rapids before making it to Dawson City. Many miners lost their lives or their possessions when their boats broke up in the rapids.

9 Those who survived the perilous journey mostly found disappointment once they reached Dawson City. Locals had already claimed all of the gold-bearing creeks, and claims of "gold for the taking" were grossly exaggerated. Many stampeders headed home, some worked for others on the claims, and still others stayed to work in Dawson City.

10 The work that was necessary to retrieve the gold was incredible. Most of the gold was not at the surface, but rather 10 or more feet below. To reach it, the miners had to dig through the permafrost—the layer of permanently frozen ground. The ground had to be thawed before it could be dug. Then the dirt had to be sluiced to separate it from the gold. All digging had to be done during the summer as it was impossible to dig in the winter when temperatures could reach –60°F. It was incredibly difficult work.

11 The biggest boom to hit this part of the world was a huge bust for the miners. The only ones to strike it rich were the merchants and profiteers who took advantage of those who hoped to "get rich quick."

"Klondike Gold Rush"—Public Domain

GO ON ▶

1. **Part A**

What is the meaning of **pamphlets** as it is used in paragraph 3 of "Klondike Gold Rush"?

Ⓐ tokens for miners

Ⓑ stocked wagons

Ⓒ guides for miners

Ⓓ camping kits

2. **Part B**

Which detail from paragraph 3 helps the reader understand the meaning of **pamphlets**?

Ⓐ "Most stampeders knew little or nothing about where they were going. . . ."

Ⓑ "This included food; clothing; tools; and camping, mining, and transportation equipment."

Ⓒ "Helping the outfitters in this regard were the Northwest Mounted Police. . . ."

Ⓓ "This was roughly one ton of goods per person."

3. **Part A**

How does the author **mainly** organize paragraphs 1 and 2 in the article "Klondike Gold Rush"?

Ⓐ chronological order

Ⓑ cause and effect

Ⓒ problem and solution

Ⓓ compare and contrast

4. **Part B**

Which description **best** illustrates how the structure in Part A is achieved?

Ⓐ "The Klondike gold rush began in July of 1897. . . ." (paragraph 1)

Ⓑ "The press was alerted. . . ." (paragraph 1)

Ⓒ ". . . miners of all shapes and sizes . . ." (paragraph 2)

Ⓓ "Only 30,000 completed the trip." (paragraph 2)

GO ON ▶

5. **Part A**

Based on the information from "Klondike Gold Rush," which sentence states a central idea of the article?

Ⓐ Most miners were pleased with the outcome of the gold rush.

Ⓑ Most miners labored hard for very little gain.

Ⓒ Work in the Yukon Territory was worth the danger of traveling there.

Ⓓ The gold rush hurt many small businesses.

6. **Part B**

Which **two** sentences from the article provide the best evidence for the answer in Part A?

Ⓐ "Outfitters sprang up overnight that were happy to sell the stampeders whatever they needed to get started." (paragraph 3)

Ⓑ "Towns such as Seattle made fortunes outfitting the miners." (paragraph 3)

Ⓒ "Those who made it across the passes found themselves at Bennett Lake." (paragraph 8)

Ⓓ "Many stampeders headed home, some worked for others on the claims, and still others stayed to work in Dawson City." (paragraph 9)

Ⓔ "The work that was necessary to retrieve the gold was incredible." (paragraph 10)

Ⓕ "The biggest boom to hit this part of the world was a huge bust for the miners." (paragraph 11)

7. **Part A**

Based on evidence in the article, why did so few miners stay in the Klondike to mine gold after arriving?

Ⓐ The conditions for mining were difficult.

Ⓑ Many laws outlawed miners.

Ⓒ The lack of wildlife made mining nearly impossible.

Ⓓ The value of gold dropped significantly.

8. **Part B**

Which detail from the article supports the answer to Part A?

Ⓐ "Helping the outfitters in this regard were the Northwest Mounted Police. . . ." (paragraph 3)

Ⓑ "The Chilkoot Pass trail was steep and hazardous." (paragraph 6)

Ⓒ "Here, boats had to be built. . . ." (paragraph 8)

Ⓓ "Most of the gold was not at the surface. . . ." (paragraph 10)

GO ON ▶

A WOMAN WHO WENT TO ALASKA

Read the passage from the book *A Woman Who Went to Alaska*. Then answer the questions.

from *A Woman Who Went to Alaska*

by May Kellogg Sullivan

The Rush

1 Since the discovery of gold by George Carmack on Bonanza Creek in September 1896, the growth of this country has been phenomenal, more especially so to one who has visited and is familiar with Dawson and the Klondyke mining section.

2 As to the entire yield of gold from the Klondyke Creeks, none can say except approximately; for the ten percent royalty imposed by the Canadian government has always met a phase of human nature which prompts to concealment and dishonesty, so that a truthful estimate cannot be made.

3 The Canadian Dominion government is very oppressive. Mining laws are very arbitrary and strictly enforced. A person wishing to prospect for gold must first procure a miner's license, paying ten dollars for it. If anything is discovered, and he wishes to locate a claim, he visits the recorder's office, states his business, and is told to call again. In the meantime, men are sent to examine the locality and if anything of value is found, the man wishing to record the claim is told that it is already located. The officials seize it. The man has no way of ascertaining if the land was properly located, and so has no redress. If the claim is thought to be poor, he can locate it by the payment of a fifteen dollar fee.

4 One half of all mining land is reserved for the crown, a quarter or more is gobbled by corrupt officials, and a meager share left for the daring miners who, by braving hardship and death, develop the mines and open up the country.

5 "Any one going into the country has no right to cut wood for any purpose, or to kill any game or catch any fish, without a license for which a fee of ten dollars must be paid. With such a license it is unlawful to sell a stick of wood for any purpose, or a pound of fish or game." The law is strictly enforced. To do anything, one must have a special permit, and for every such permit he must pay roundly.

6 The story is told of a miner in a hospital who was about to die. He requested that the Governor be sent for. Being asked what he wanted with the Governor, he replied: "I haven't any permit, and if I should undertake to die without a permit, I should get myself arrested."

GO ON ▶

7 It is a well-known fact that many claims on Eldorado, Hunker, and Bonanza Creeks have turned out hundreds of thousands of dollars. One pan of gravel on Eldorado Creek yielded $2,100. Frank Dinsmore on Bonanza Creek took out ninety pounds of solid gold or $24,480 in a single day. On Aleck McDonald's claim on Eldorado, one man shoveled in $20,000 in twelve hours. McDonald, in two years, dug from the frozen ground $2,207,893. Charley Anderson, on Eldorado, panned out $700 in three hours. T.S. Lippy is said to have paid the Canadian government $65,000 in royalties for the year 1898 and Clarence Berry about the same.

8 On Skukum Gulch $30,000 were taken from two boxes of dirt. Frank Phiscator of Michigan, after a few months' work, brought home $100,000 in gold, selling one-third of his claim interests for $1,333,000, or at the rate of $5,000,000 for the whole.

9 When a man is compelled to pay one thousand dollars out of every ten thousand he digs from the ground, he will boast little of large "clean-ups"; and for this reason it is hard to estimate the real amount of gold extracted from the Klondyke mines.

"A Woman Who Went to Alaska"—Public Domain

GO ON ▶

1. **Part A**

As used in paragraph 3 of the passage from *A Woman Who Went to Alaska*, what is the meaning of the word **oppressive**?

Ⓐ unjustly harsh

Ⓑ occasionally flexible

Ⓒ unexpectedly angry

Ⓓ appropriately demanding

2. **Part B**

Which phrase from paragraph 3 in the passage from *A Woman Who Went to Alaska* helps the reader understand the meaning of the word **oppressive**?

Ⓐ ". . . Canadian Dominion government . . ."

Ⓑ ". . . arbitrary and strictly enforced . . ."

Ⓒ ". . . prospect for gold . . ."

Ⓓ ". . . he visits the recorder's office . . ."

GO ON ▶

3. **Part A**

Which statement **best** describes the Canadian government's treatment of the miners in the passage from *A Woman Who Went to Alaska*?

Ⓐ a controlling government that takes advantage of the miners

Ⓑ a fair government that wants the miners to succeed without assistance

Ⓒ a disorganized government that fails to set appropriate rules for the miners

Ⓓ an irresponsible government that is indifferent to the miners

4. **Part B**

Which **three** actions does the government take that provide evidence for the answer to Part A?

Ⓐ charging high taxes on mined gold

Ⓑ encouraging fishing and hunting

Ⓒ enforcing a nightly curfew

Ⓓ requiring multiple licenses and permits

Ⓔ seizing property known to contain gold

Ⓕ assisting newcomers seeking a claim

Ⓖ banning the use of explosives

GO ON ▶

CITY OF GOLD

Read a transcript of an excerpt from *City of Gold*. Then answer the questions.

from *City of Gold*

a transcript

1 The winter of 1897, beyond mountains two thousand miles north from civilization, the cry was "Gold!" All over the world a million people laid plans to go. A hundred thousand actually set out, but the going was so hard, the way so weary, that more than half turned back.

2 My father was one of those who struggled on. Scarcely any of these men were miners; most were white-collar workers. My father had just graduated from university in civil engineering. All of them had one idea. They were on their way to the Klondike to shovel up gold, and they were going to be rich beyond the dreams of avarice.

3 The Chilkoot Pass: this scene above all others remained in my father's mind to his dying day. Even when his memory began to fail, this spectacle remained. You had to pack a ton of goods up this terrible 45-degree slope of pure ice, a hundred pounds at a time, over and over again, a year's outfit. Without that, the mounties would not let you enter the Yukon. You couldn't stop to rest or it might be hours before they'd let you back into that endless human chain.

4 At the top, a city of provisions. Seventy feet of snow fell that winter, and by spring there were seven such cities, layer upon layer buried beneath it, but the persistent ones dug out their supplies and sledded off down the mountain slopes on the next lap of the great adventure.

GO ON ▶

1 **Part A**

What are the **most likely** reasons the narrator mentions that his father was a part of the gold rush? Select **two** answers.

Ⓐ It explains that the narrator respects his family.

Ⓑ It shows the extent to which the narrator values history.

Ⓒ It helps the reader understand the narrator's life.

Ⓓ It reveals a connection between the narrator and the miners.

Ⓔ It highlights the impact of the experience on a specific person.

Ⓕ It emphasizes that there were a large number of miners with families.

2. **Part B**

Which words from the transcript of *City of Gold* provide the **best** evidence for the answers to Part A?

Ⓐ "beyond mountains . . . the cry was 'Gold!' " (paragraph 1)

Ⓑ "Scarcely any of these men were miners; most were white-collar workers." (paragraph 2)

Ⓒ "All of them had one idea. . . . they were going to be rich . . ." (paragraph 2)

Ⓓ "The Chilkoot Pass: this scene above all others remained in my father's mind. . . ." (paragraph 3)

GO ON ▶

The authors of "Klondike Gold Rush" and *A Woman Who Went to Alaska* and the narrator of the transcript from *City of Gold* are discussing the same topic but are using different points of view.

How does each person's point of view shape the reader's understanding of the miners' lives? Use details from each source to support your answer.

GO ON ▶

GO ON ▶

GO ON ▶


STOP

7th Grade Live Oak Math			
Date	**Lesson**	**Learning Goals**	**Assignment**
Monday, March 30	Unit 7, Lesson 1: Relationships of Angles	• I can find unknown angle measures by reasoning about adjacent angles with known measures. • I can recognize when an angle measures 90 degrees, 180 degrees, or 360 degrees .	Complete **Daily Warm-Up** Complete **Illustrative Mathematics Lesson** for the Day For each lesson: 1. Review Lesson Summary 2. Complete Lesson Activities 3. Complete Practice Problems
Tuesday, March 31	Unit 7, Lesson 2: Adjacent Angles	• I can find unknown angle measures by reasoning about complementary or supplementary angles. • I can recognize when adjacent angles are complementary or supplementary	
Wednesday, April 1	Unit 7, Lesson 3: Nonadjacent Angles	• I can determine if angles that are not adjacent are complementary or supplementary. • I can explain what vertical angles are in my own words.	
Thursday, April 2	Unit 7, Lesson 4: Solving for Unknown Angles	• I can reason through multiple steps to find unknown angle measures. • I can recognize when an equation represents a relationship between angle measures.	
Friday, April 3	Unit 7, Lesson 5: Using Equations to Solve for Unknown Angles	• I can write an equation to represent a relationship between angle measures and solve the equation to find unknown angle measures	
Monday, April 6	Unit 7 Extra Practice	• Complete Cool Downs for Lessons 1-5	
Tuesday, April 7	Unit 8, Lesson 1: Mystery Bags	• I can get an idea for the likelihood of an event by using results from previous experiments.	
Wednesday, April 8	Unit 8, Lesson 2: Chance Experiments	• I can describe the likelihood of events using the words impossible, unlikely, equally likely as not, likely, or certain. • I can tell which event is more likely when the chances of different events are expressed as fractions, decimals, or percentages	
Spring Break: April 9- April 13			

7th Grade Warm Ups

Monday, March 30

The cost of granola bars is proportional to the number of granola bars as shown in the table.

Number of Granola Bars	Cost
4	$9.00
12	$27.00
24	$54.00

What is the constant of proportionality, in dollars per granola bar?

Enter your answer in the box.

$ ☐

Last year, Andrea bought 85 songs from an online company for a total of $96.90. Each song cost $1.09 plus tax.

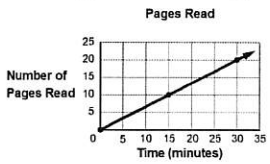
Part A

Which equation can be used to determine the amount of tax, x, in dollars, that Andrea paid for each song?

- $85\,(1.09) + x = 96.90$
- $85x + 1.09 = 96.90$
- $85\,(1.09 + x) = 96.90$
- $x\,(85 + 1.09) = 96.90$

Tuesday, March 31

Raul created a graph to show the number of pages he read over a period of time.



Raul claims his graph shows a proportional relationship because the data forms a straight line. He also claims his graph shows he read 1.5 pages per minute. Are Raul's claims correct? Justify your reasoning. Write an equation to represent the data in the graph.

Enter your justifications and equation in the box.

Calculator

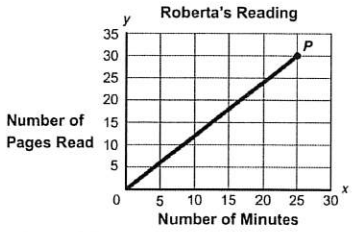
A family buys 6 tickets to a show. They also pay a $3 parking fee. They spend $27 to see the show.

Create an equation to model the situation.

What is the cost of each ticket?

Wednesday, April 1

The graph represents the number of pages Roberta read over a period of time.



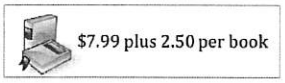
Drag tiles to the empty boxes to correctly complete the sentences about the graph.

Point *P* represents that Roberta read [ ] pages in [ ] minutes.

The unit rate, in pages read per minute, is the [ ]-coordinate in the ordered pair [ ].

x	y	25	30	(1, 0.83)	(1, 1.2)	(25, 30)	(30, 25)

Jalen orders books from an online company. The company has a special deal on their books as shown.



The equation $7.99 + 2.50b = 82.99$ represents the number of books, b, Jalen orders. How many books does Jalen order? Show your work or explain how you found your answer.

Thursday, April 2

Simone paid $5.25 for 3 pounds of apples. Which equation represents the cost, in dollars, C, of buying a pounds of apples?

- $C = 1.75a$
- $C = 2.25a$
- $C = 1.75 + a$
- $C = 2.25 + a$

Solve each equation.

a. $2(x - 3) = 14$

b. $-5(x - 1) = 40$

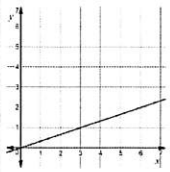
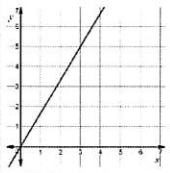
c. $12(x + 10) = 24$

d. $\frac{1}{6}(x + 6) = 11$

e. $\frac{5}{7}(x - 9) = 25$

Friday, April 3

In each row, the equation or graph shows that y is proportional to x. Select one choice in each row of the table to identify the constant of proportionality.

	0	$\frac{1}{3}$	$\frac{3}{4}$	1	$\frac{5}{3}$	3	5
$y = x$	○	○	○	○	○	○	○
$y = \frac{1}{3}x$	○	○	○	○	○	○	○
	○	○	○	○	○	○	○
	○	○	○	○	○	○	○

Match each equation to its solution and to the story it describes.

Equations:

A. $5x - 7 = 3$

B. $7 = 3(5 + x)$

C. $3x + 5 = -7$

D. $\frac{1}{3}(x + 7) = 5$

Solutions:

1. -4
2. $\frac{-8}{3}$
3. 2
4. 8

Monday, April 6

The table shows the number of hours Nina worked on three different days and the amount of money she earned.

Hours Worked	Amount Earned
3	$34.50
5	$57.50
8	$92.00

Part A

Based on the data in the table, write an equation that can be used to determine the amount of money Nina earns given the number of hours she works. Show your work or explain how you determined your equation. Be sure to define your variables.

Solve each equation.

a. $4x = -28$

b. $x - -6 = -2$

c. $-x + 4 = -9$

d. $-3x + 7 = 1$

e. $25x + -11 = -86$

Tuesday, April 7

Consider proportional relationships.

Part A

Which tables show a proportional relationship between x and y? Select **all** that apply.

x	y
1	1
2	4
3	9

x	y
2	1
4	1
6	1

x	y
1	0.5
2	1
3	1.5

x	y
10	30
15	45
20	60

x	y
0	1
2.5	5
5	10

Part B

On a coordinate plane, a line goes through the point $(3,\ 1)$ and is the graph of a proportional relationship. Which point does this line also go through?

- $(2,\ 0)$
- $(4,\ 12)$
- $(6,\ 4)$
- $(15,\ 5)$

Calculator

Solve each equation

Part A

$\frac{1}{3}p + 7 = 25$

Enter your answer in the box.

$p =$ ☐

Part B

$-20 = 2(n - 3)$

Enter your answer in the box.

$n =$ ☐

Wednesday, April 8

What is the constant of proportionality in the table below?

What does it represent in the context of the situation?

Cost of Grain by Weight

Pounds	Cost (in dollars)
1.0	0.25
4.0	1.00

The table shows a proportional relationship between the number of pounds of grapes purchased and the total cost of the grapes.

Grapes

Number of Pounds	Total Cost (dollars)
4	2.76
7	4.83
9	6.21

A row of values is missing in the table.

Which number of pounds of grapes and total cost of the grapes could be used as the missing values in the table?

Select **each** correct response.

(a) Pounds of grapes: 2
Total cost: $1.38

(b) Pounds of grapes: 3
Total cost: $2.53

(c) Pounds of grapes: 6
Total cost: $3.68

(d) Pounds of grapes: 8
Total cost: $5.52

(e) Pounds of grapes: 11
Total cost: $8.97

7th Grade Live Oak Distance Learning Materials
March 30-April 8

Unit 7
Student Task Statements

Angles, Triangles, and Prisms

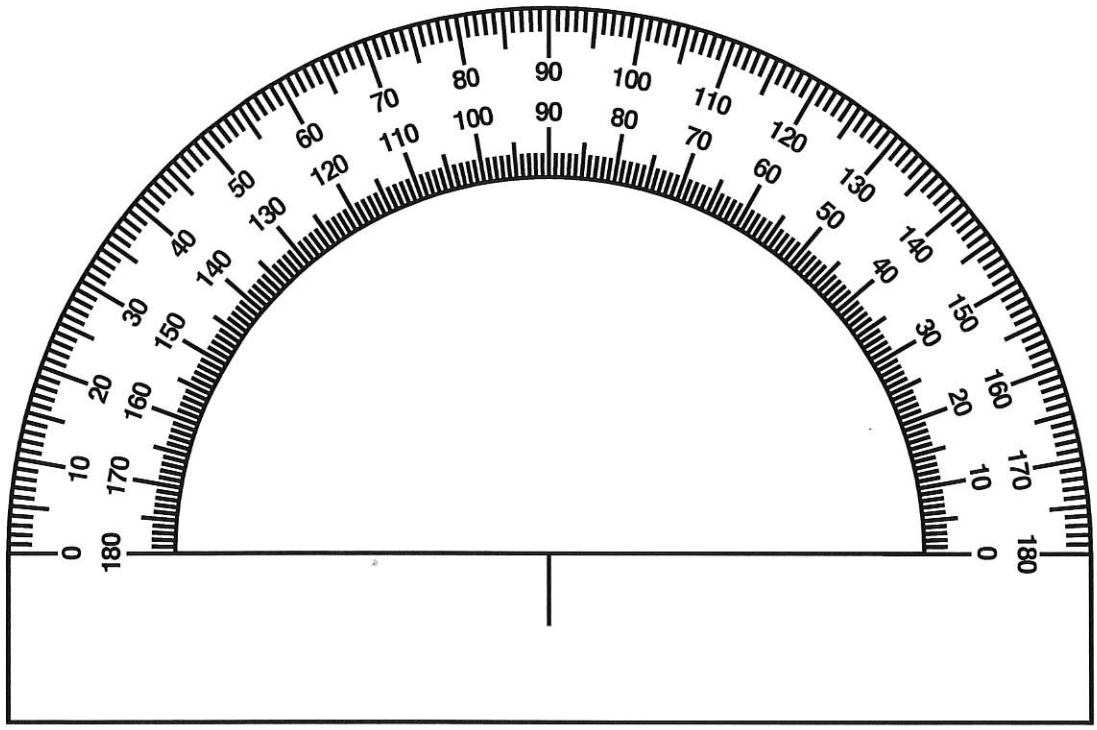
Click on a title in the list below to scroll directly to that lesson.

Unit 8

Probability and Sampling

Protractor

Detach and use throughout Unit 7 Lessons 1-5 as needed.



NAME DATE PERIOD

Unit 7, Lesson 1

Relationships of Angles

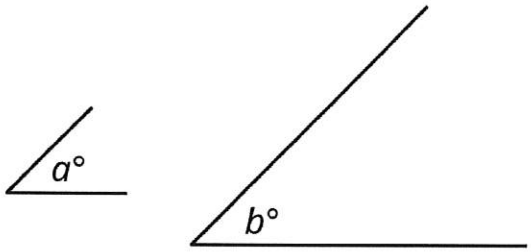
Let's examine some special angles.

1.1 Visualizing Angles

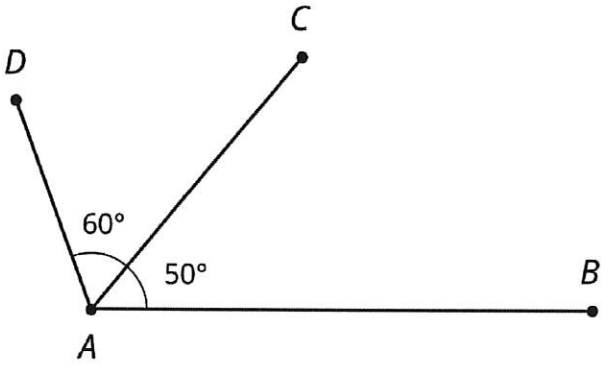
Interactive digital version available

a.openup.org/ms-math/en/s/ccss-7-7-1-1

1. Which angle is bigger?



2. Identify an obtuse angle in the diagram.



1.2 Pattern Block Angles

Interactive digital version available

a.openup.org/ms-math/en/s/ccss-7-7-1-2

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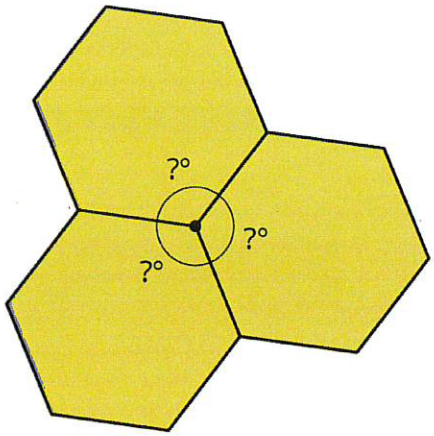
1. Trace one copy of every different pattern block. Each block contains either 1 or 2 angles with different degree measures. Which blocks have only 1 unique angle? Which have 2?

2. If you trace three copies of the hexagon so that one vertex from each hexagon touches the same point, as shown, they fit together without any gaps or overlaps. Use this to figure out the degree measure of the angle inside the hexagon pattern block.



3. Figure out the degree measure of all of the other angles inside the pattern blocks that you traced in the first question. Be prepared to explain your reasoning.

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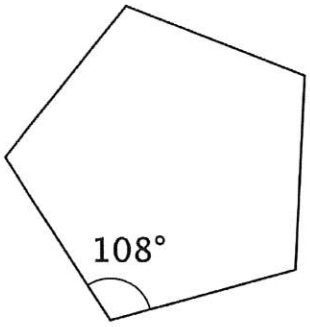
Are you ready for more?

We saw that it is possible to fit three copies of a regular hexagon snugly around a point.

Each interior angle of a regular pentagon measures 108°. Is it possible to fit copies of a regular pentagon snugly around a point? If yes, how many copies does it take? If not, why not?

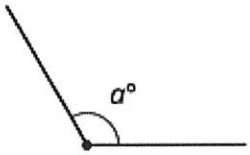


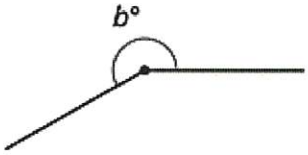
1.3 More Pattern Block Angles

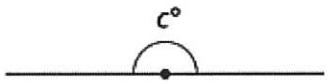
Interactive digital version available

a.openup.org/ms-math/en/s/ccss-7-7-1-3

1. Use pattern blocks to determine the measure of each of these angles.







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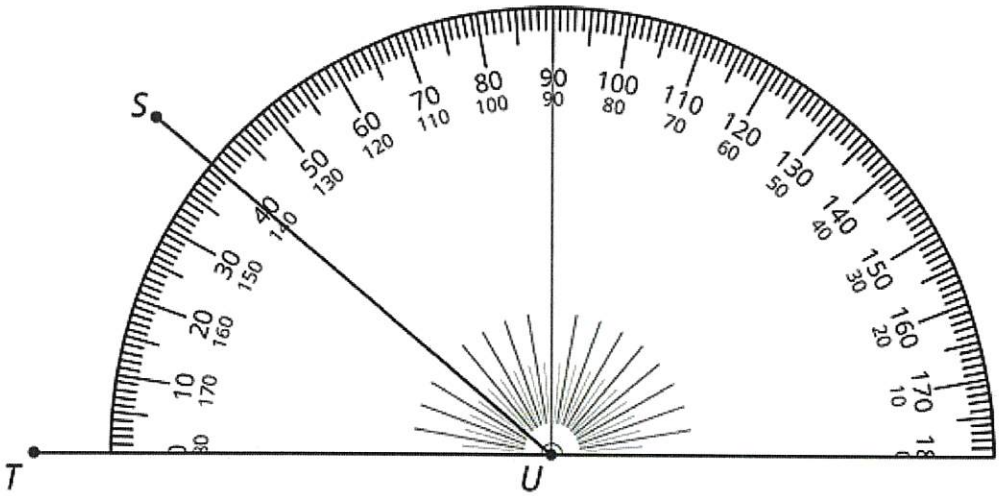
2. If an angle has a measure of 180°, then its sides form a straight line. An angle that forms a straight line is called a straight angle. ~~Find as many different combinations of pattern blocks as you can that make a straight angle.~~ Draw two examples of straight angles below.

1.4 Measuring Like This or That

Tyler and Priya were both measuring angle TUS.



Priya thinks the angle measures 40 degrees. Tyler thinks the angle measures 140 degrees. Do you agree with either of them? Explain your reasoning.

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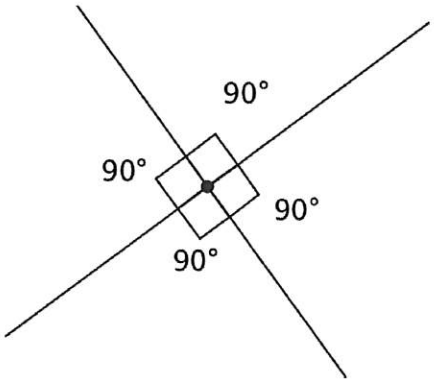
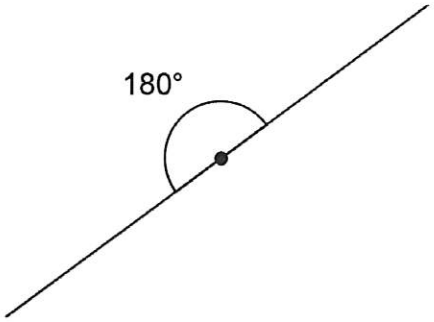
Lesson 1 Summary

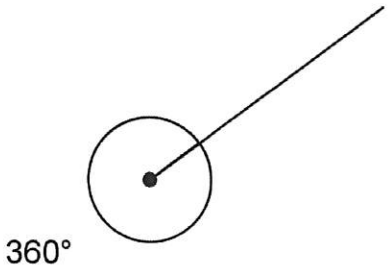
When two lines intersect and form four equal angles, we call each one a **right angle**. A right angle measures 90°. You can think of a right angle as a quarter turn in one direction or the other.



An angle in which the two sides form a straight line is called a **straight angle**. A straight angle measures 180°. A straight angle can be made by putting right angles together. You can think of a straight angle as a half turn, so that you are facing in the opposite direction after you are done.



If you put two straight angles together, you get an angle that is 360°. You can think of this angle as turning all the way around so that you are facing the same direction as when you started the turn.



When two angles share a side and a vertex, and they don't overlap, we call them **adjacent angles**.

Glossary Terms

adjacent angles

right angle

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straight angle

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Unit 7, Lesson 1
Practice Problems

1. Here are questions about two types of angles.

   Draw a right angle. How do you know it's a right angle? What is its measure in degrees?

   Draw a straight angle. How do you know it's a straight angle? What is its measure in degrees?

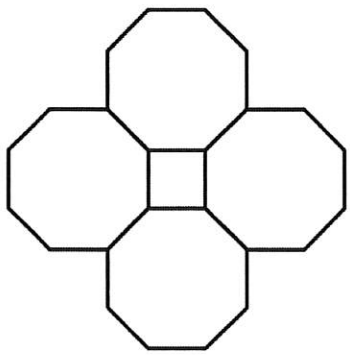
2. An equilateral triangle's angles each have a measure of 60 degrees.

   a. Can you put copies of an equilateral triangle together to form a straight angle? Explain or show your reasoning.

   b. Can you put copies of an equilateral triangle together to form a right angle? Explain or show your reasoning.

3. Here is a square and some regular octagons.

   In this pattern, all of the angles inside the octagons have the same measure. The shape in the center is a square. Find the measure of one of the angles inside one of the octagons.



4. The height of the water in a tank decreases by 3.5 cm each day. When the tank is full, the water is 10 m deep. The water tank needs to be refilled when the water height drops below 4 m.

   a. Write a question that could be answered by solving the equation $10 - 0.035d = 4$.

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b. Is 100 a solution of $10 - 0.035d > 4$? Write a question that solving this problem could answer.

5. Use the distributive property to write an expression that is equivalent to each given expression.

   a. $-3(2x - 4)$

   b. $0.1(-90 + 50a)$

   c. $-7(-x - 9)$

   d. $\frac{4}{5}(10y + -x + -15)$

6. Lin's puppy is gaining weight at a rate of 0.125 pounds per day. Describe the weight gain in days per pound.

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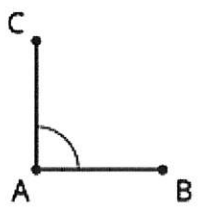
Unit 7, Lesson 2

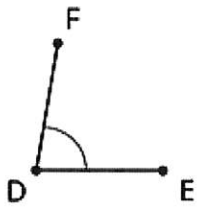
Adjacent Angles

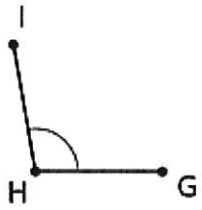
Let's look at some special pairs of angles.

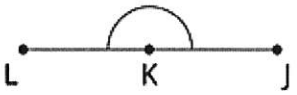
2.1 Estimating Angle Measures

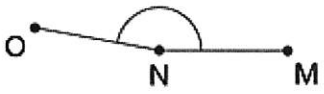
Estimate the degree measure of each indicated angle.

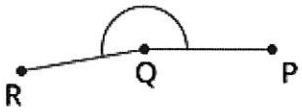


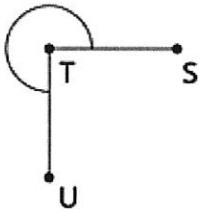


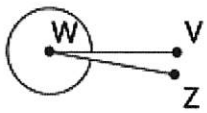










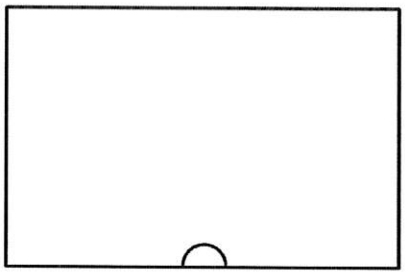


NAME DATE PERIOD

2.2 Cutting Rectangles

Your teacher will give you two small, rectangular papers.

1. On one of the papers, draw a small half-circle in the middle of one side.



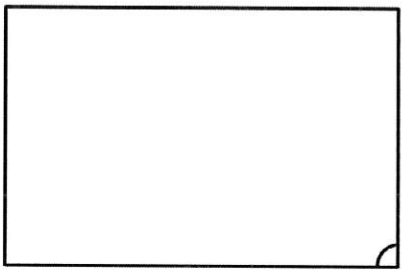
2. Cut a straight line, starting from the center of the half-circle, all the way across the paper to make 2 separate pieces. (Your cut does not need to be perpendicular to the side of the paper.)

3. On each of these two pieces, measure the angle that is marked by part of a circle. Label the angle measure on the piece.

4. What do you notice about these angle measures?

5. Clare measured 70 degrees on one of her pieces. Predict the angle measure of her other piece.

6. On the other rectangular paper, draw a small quarter-circle in one of the corners.



7. Repeat the previous steps to cut, measure, and label the two angles marked by part of a circle.

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8. What do you notice about these angle measures?

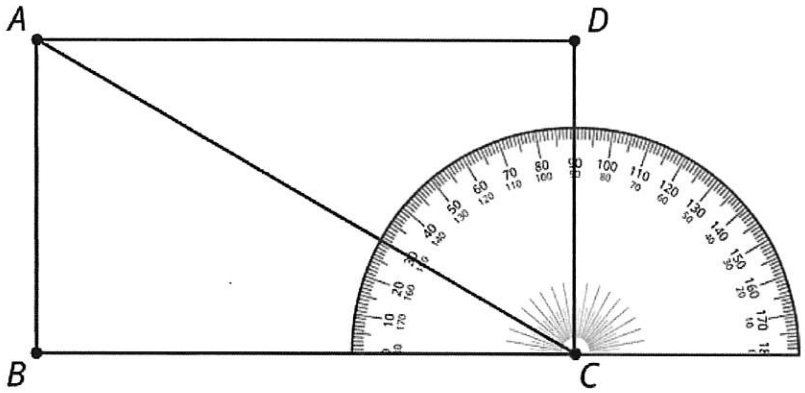
9. Priya measured 53 degrees on one of her pieces. Predict the angle measure of her other piece.

2.3 Is It a Complement or Supplement?

1. Use the protractor in the picture to find the measure of angles:

   a. BCA

   b. BCD



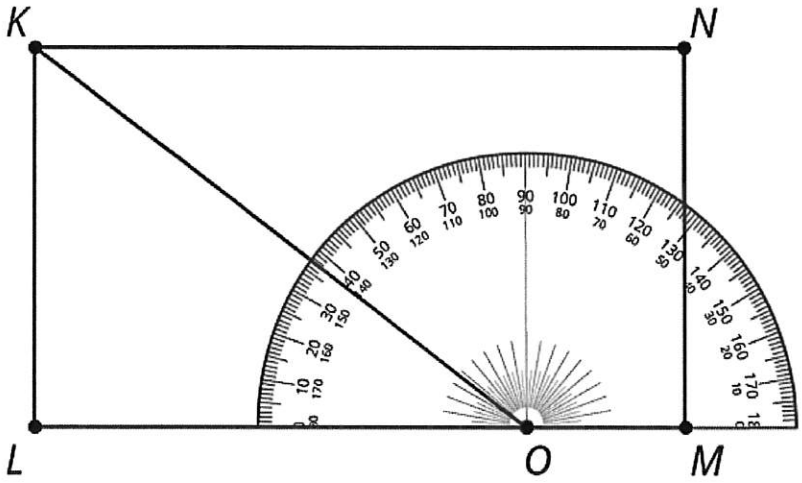
   c. Explain how to find the measure of angle ACD without repositioning the protractor.

NAME DATE PERIOD

2. Use the protractor in the picture to find the measure of angles:

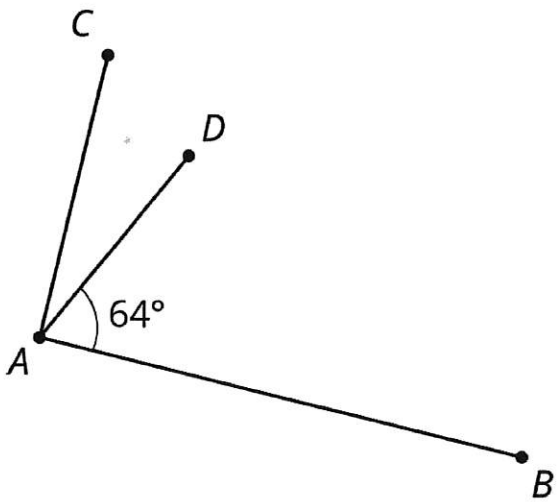
a. LOK

b. LOM



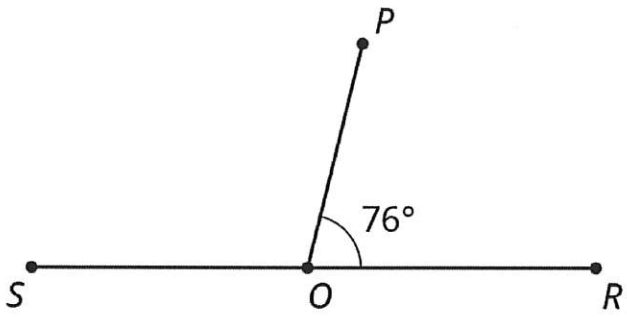
c. Explain how to find the measure of angle KOM without repositioning the protractor.

3. Angle BAC is a right angle. Find the measure of angle CAD.



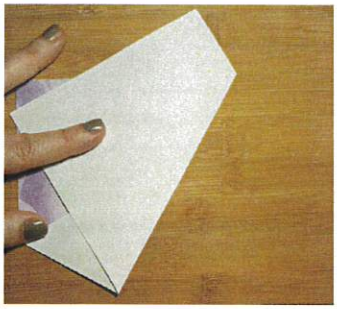
NAME DATE PERIOD

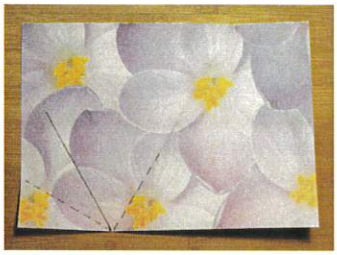
4. Point O is on line RS. Find the measure of angle SOP.



Are you ready for more?

Clare started with a rectangular piece of paper. She folded up one corner, and then folded up the other corner, as shown in the photos.



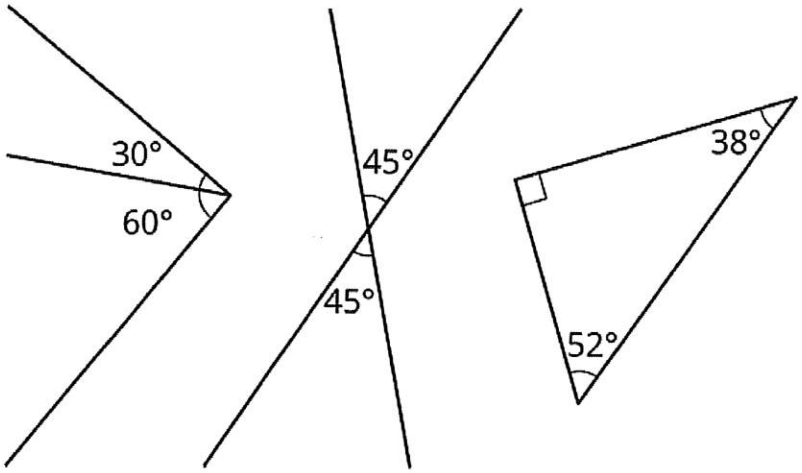


1. Try this yourself with any rectangular paper. Fold the left corner up at any angle, and then fold the right corner up so that the edges of the paper meet.
2. Clare thought that the angle at the bottom looked like a 90 degree angle. Does yours also look like it is 90 degrees?
3. Can you explain why the bottom angle *always has to be* 90 degrees? Hint: the third photo shows Clare's paper, unfolded. The crease marks have dashed lines, and the line where the two paper edges met have a solid line. Mark these on your own paper as well.

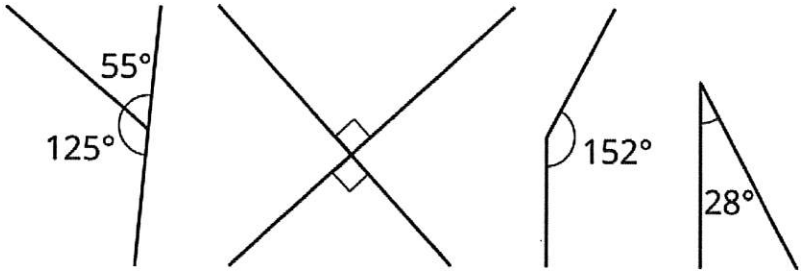
Lesson 2 Summary

If two angle measures add up to 90°, then we say the angles are **complementary**. Here are three examples of pairs of complementary angles.

NAME DATE PERIOD



If two angle measures add up to 180°, then we say the angles are **supplementary**. Here are three examples of pairs of supplementary angles.



Glossary Terms

complementary

supplementary

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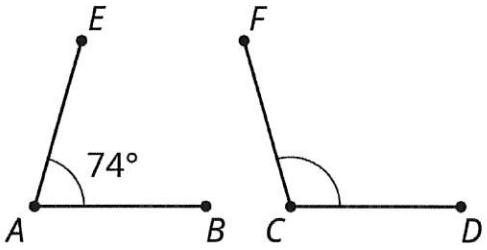
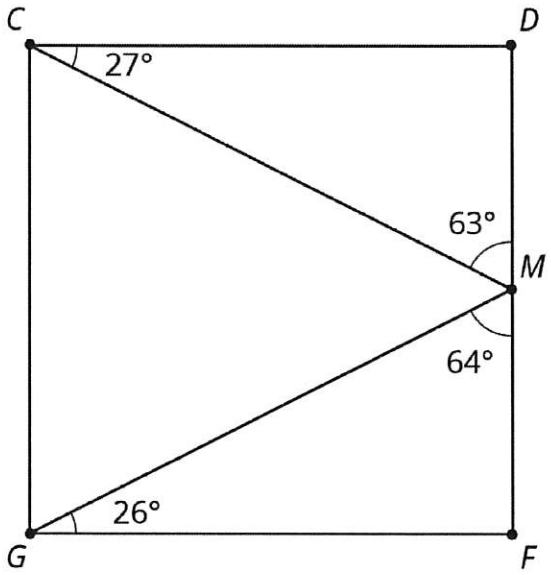
Unit 7, Lesson 2
Practice Problems

1. Angles A and C are supplementary. Find the measure of angle C.



2. a. List two pairs of angles in square $CDFG$ that are complementary.

   b. Name three angles that sum to 180°.



3. Complete the equation with a number that makes the expression on the right side of the equal sign equivalent to the expression on the left side.

$$5x - 2.5 + 6x - 3 = \_\_(2x - 1)$$

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4. Match each table with the equation that represents the same proportional relationship.

1. $y = 1.5x$
2. $y = 1.25x$
3. $y = 4x$

A.

x	y
2	8
3	12
4	16
5	20

B.

x	y
3	4.5
6	9
7	10.5
10	15

C.

x	y
2	$\frac{5}{2}$
4	5
6	$\frac{15}{2}$
12	15

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Unit 7, Lesson 3

Nonadjacent Angles

Let's look at angles that are not right next to one another.

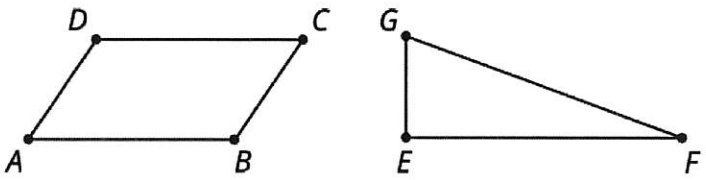
3.1 Finding Related Statements

Given a and b are numbers, and $a + b = 180$, which statements also must be true?

$a = 180 - b$ $a - 180 = b$ $360 = 2a + 2b$ $a = 90$ and $b = 90$

3.2 Polygon Angles

Use any useful tools in the geometry toolkit to identify any pairs of angles in these figures that are complementary or supplementary.



3.3 Vertical Angles

Use a straightedge to draw two intersecting lines. Use a protractor to measure all four angles whose vertex is located at the intersection.

Compare your drawing and measurements to the people in your group. Make a conjecture about the relationships between angle measures at an intersection.

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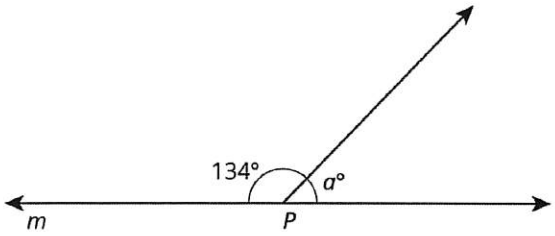
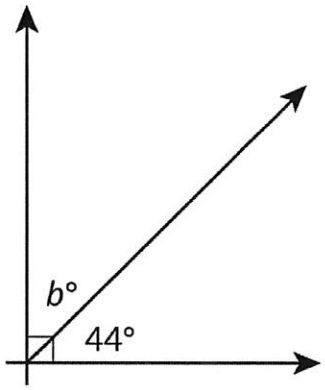
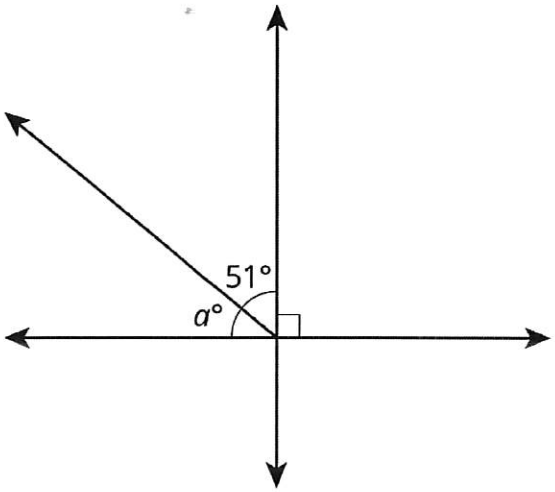
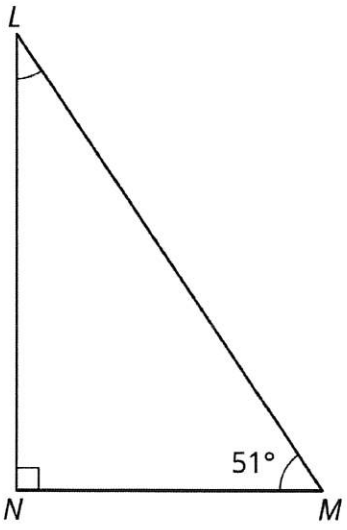
3.4 Row Game: Angles

Find the measure of the angles in one column. Your partner will work on the other column. Check in with your partner after you finish each row. Your answers in each row should be the same. If your answers aren't the same, work together to find the error and correct it.

column A	column B
P is on line m. Find the value of a. 	Find the value of b. 
Find the value of a. 	In right triangle LMN, angles L and M are complementary. Find the measure of angle L. 

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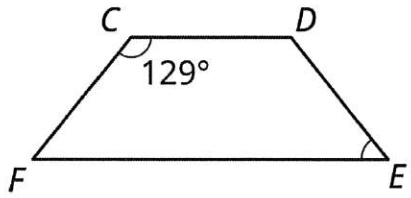
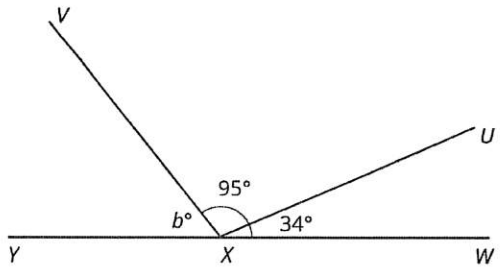
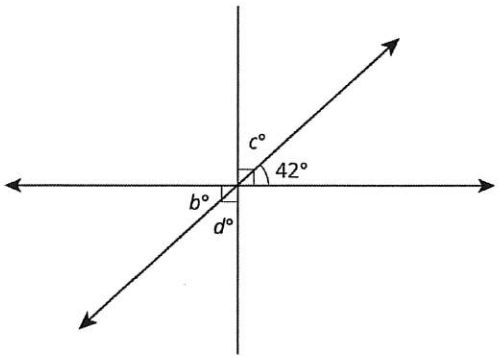
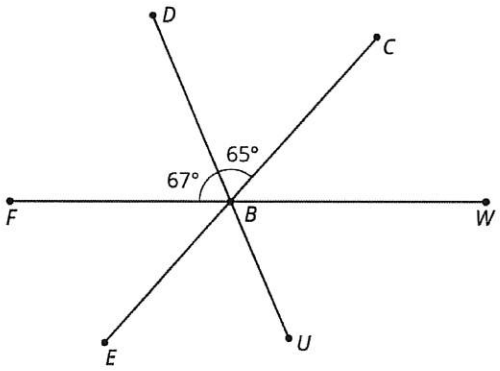
column A	column B
Angle C and angle E are supplementary. Find the measure of angle E. 	X is on line WY. Find the value of b. 
Find the value of c. 	B is on line FW. Find the measure of angle CBW. 
Two angles are complementary. One angle measures 37 degrees. Find the measure of the other angle.	Two angles are supplementary. One angle measures 127 degrees. Find the measure of the other angle.

Lesson 3 Summary

When two lines cross, they form two pairs of **vertical angles**. Vertical angles are across the intersection point from each other.

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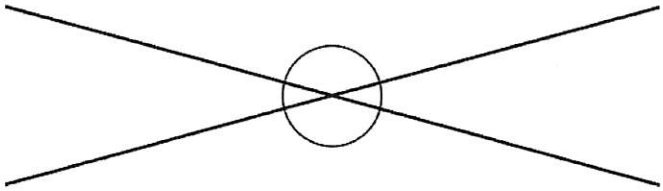
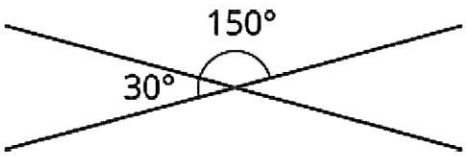
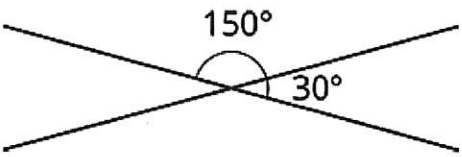
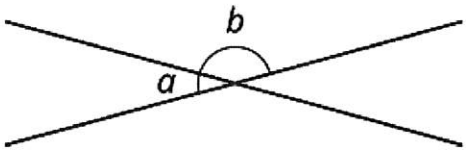


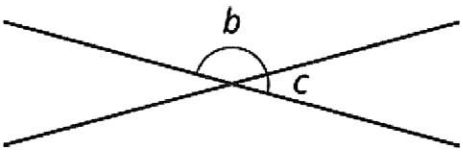
Vertical angles always have equal measure. We can see this because they are always supplementary with the same angle. For example:





This is always true!





$a + b = 180$ so $a = 180 - b$.

$c + b = 180$ so $c = 180 - b$.

That means $a = c$.

Glossary Terms

vertical angles

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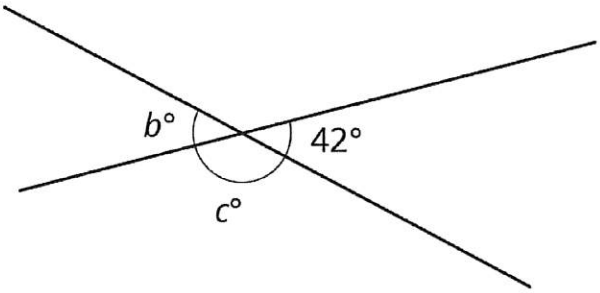
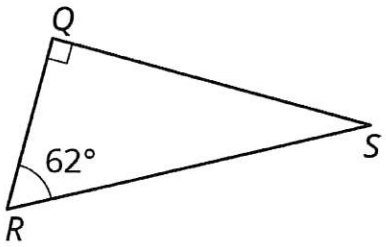
Unit 7, Lesson 3

Practice Problems

1. Two lines intersect. Find the value of b and c.



2. In this figure, angles R and S are complementary. Find the measure of angle S.



3. If two angles are both vertical and supplementary, can we determine the angles? Is it possible to be both vertical and complementary? If so, can you determine the angles? Explain how you know.

4. Match each expression in the first list with an equivalent expression from the second list.

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A. $5(x+1)-2x+11$

B. $2x+2+x+5$

C. $\frac{-3}{8}x-9+\frac{5}{8}x+1$

D. $2.06x-5.53+4.98-9.02$

E. $99x+44$

1. $\frac{1}{4}x-8$
2. $\frac{1}{2}(6x+14)$
3. $11(9x+4)$
4. $3x+16$
5. $2.06x+(-5.53)+4.98+(-9.02)$

5. Factor each expression.

   a. $15a-13a$

   b. $-6x-18y$

   c. $36abc+54ad$

6. The directors of a dance show expect many students to participate but don't yet know how many students will come. The directors need 7 students to work on the technical crew. The rest of the students work on dance routines in groups of 9. For the show to work, they need at least 6 full groups working on dance routines.

   a. Write and solve an inequality to represent this situation, and graph the solution on a number line.

   b. Write a sentence to the directors about the number of students they need.

7. A small dog gets fed $\frac{3}{4}$ cup of dog food twice a day. Using d for the number of days and f for the amount of food in cups, write an equation relating the variables. Use the equation to find how many days a large bag of dog food will last if it contains 210 cups of food.

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Unit 7, Lesson 4

Solving for Unknown Angles

Let's figure out some missing angles.

4.1 True or False: Length Relationships

Here are some line segments.

Decide if each of these equations is true or false. Be prepared to explain your reasoning.

$CD + BC = BD$

$AB + BD = CD + AD$

$AC - AB = AB$

$BD - CD = AC - AB$

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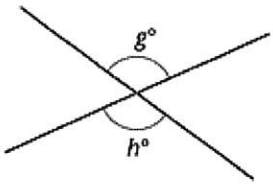
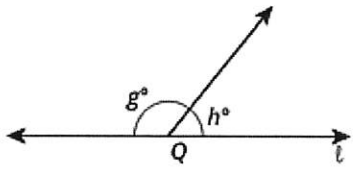
4.3 What's the Match?

Match each figure to an equation that represents what is seen in the figure. For each match, explain how you know they are a match.

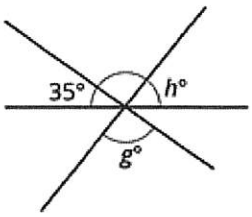
A



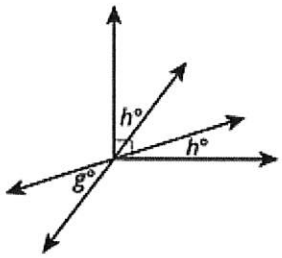
B



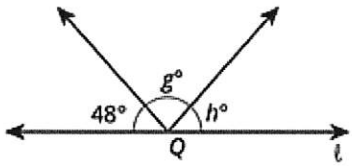
C



D



E



1. $g + h = 180$
2. $g = h$
3. $2h + g = 90$
4. $g + h + 48 = 180$
5. $g + h + 35 = 180$

Are you ready for more?

1. What is the angle between the hour and minute hands of a clock at 3:00?
2. You might think that the angle between the hour and minute hands at 2:20 is 60 degrees, but it is not! The hour hand has moved beyond the 2. Calculate the angle between the clock hands at 2:20.
3. Find a time where the hour and minute hand are 40 degrees apart. (Assume that the time has a whole number of minutes.) Is there just one answer?

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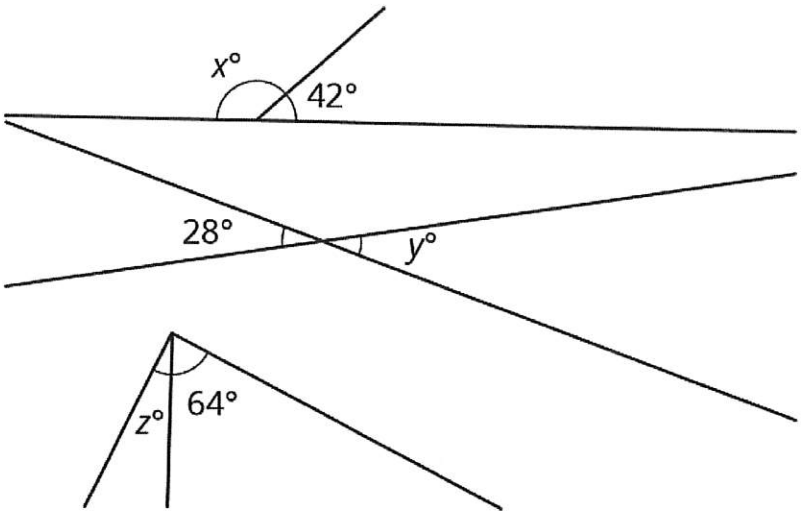
Lesson 4 Summary

We can write equations that represent relationships between angles.



- The first pair of angles are supplementary, so $x + 42 = 180$.
- The second pair of angles are vertical angles, so $y = 28$.
- The third pair of angles are complementary, so $z + 64 = 90$.

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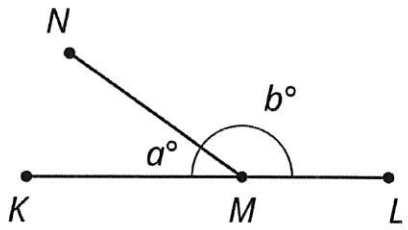
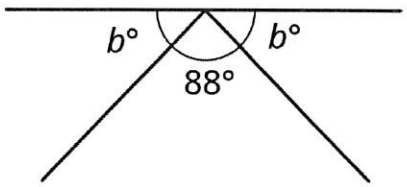
Unit 7, Lesson 4
Practice Problems

1. M is a point on line segment KL. NM is a line segment. Select **all** the equations that represent the relationship between the measures of the angles in the figure.



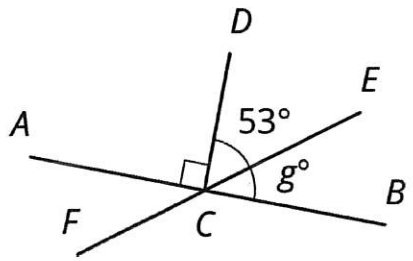
A. $a = b$
B. $a + b = 90$
C. $b = 90 - a$
D. $a + b = 180$
E. $180 - a = b$
F. $180 = b - a$

2. Which equation represents the relationship between the angles in the figure?



A. $88 + b = 90$
B. $88 + b = 180$
C. $2b + 88 = 90$
D. $2b + 88 = 180$

3. Segments AB, EF, and CD intersect at point C, and angle ACD is a right angle. Find the value of g.



4. Select **all** the expressions that are the result of decreasing x by 80%.

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A. $\frac{20}{100}x$

B. $x - \frac{80}{100}x$

C. $\frac{100-20}{100}x$

D. $0.80x$

E. $(1 - 0.8)x$

5. Andre is solving the equation $4(x + \frac{3}{2}) = 7$. He says, "I can subtract $\frac{3}{2}$ from each side to get $4x = \frac{11}{2}$ and then divide by 4 to get $x = \frac{11}{8}$." Kiran says, "I think you made a mistake."

   a. How can Kiran know for sure that Andre's solution is incorrect?

   b. Describe Andre's error and explain how to correct his work.

6. Solve each equation.

   a. $\frac{1}{7}x + \frac{3}{4} = \frac{9}{8}$

   b. $\frac{2}{3} + \frac{1}{5}x = \frac{5}{6}$

   c. $\frac{3}{2} = \frac{4}{3}x + \frac{2}{3}$

   d. $0.3x + 7.9 = 9.1$

   e. $11.03 = 8.78 + 0.02x$

7. A train travels at a constant speed for a long distance. Write the two constants of proportionality for the relationship between distance traveled and elapsed time. Explain what each of them means.

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time elapsed (hr)	distance (mi)
1.2	54
3	135
4	180

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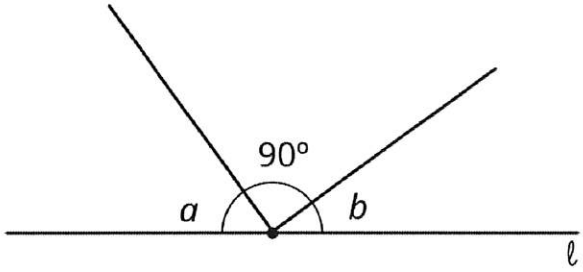
Unit 7, Lesson 5

Using Equations to Solve for Unknown Angles

Let's figure out missing angles using equations.

5.1 Is This Enough?

Tyler thinks that this figure has enough information to figure out the values of a and b.



Do you agree? Explain your reasoning.

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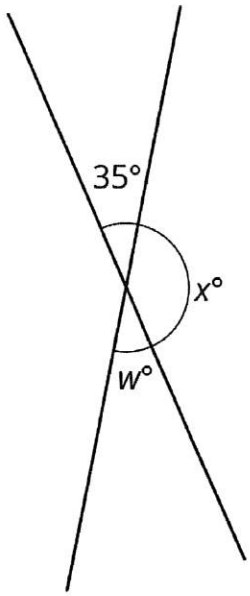
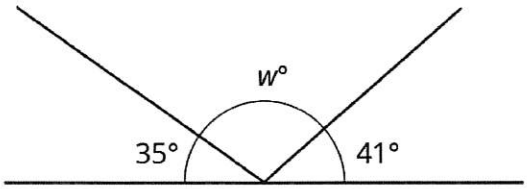
5.2 What Does It Look Like?

Elena and Diego each wrote equations to represent these diagrams. For each diagram, decide which equation you agree with, and solve it. You can assume that angles that look like right angles are indeed right angles.

1. Elena: $x = 35$
   Diego: $x + 35 = 180$



2. Elena: $35 + w + 41 = 180$
   Diego: $35 + w = 180$



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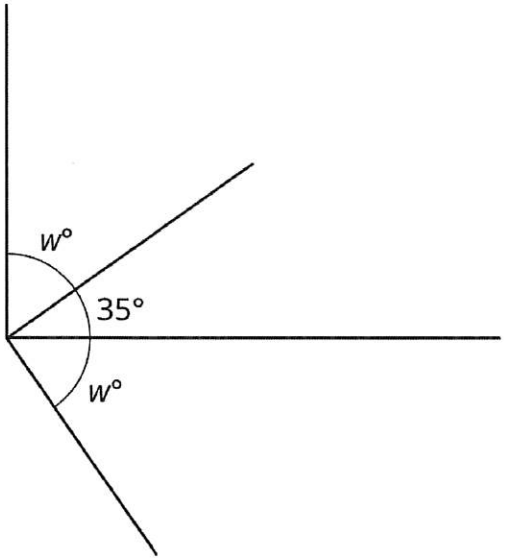
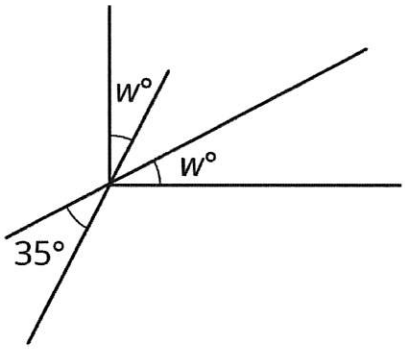
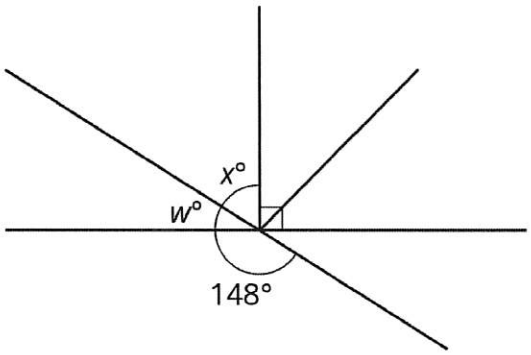
3. Elena: $w + 35 = 90$
   Diego: $2w + 35 = 90$



4. Elena: $2w + 35 = 90$
   Diego: $w + 35 = 90$



5. Elena: $w + 148 = 180$
   Diego: $x + 90 = 148$



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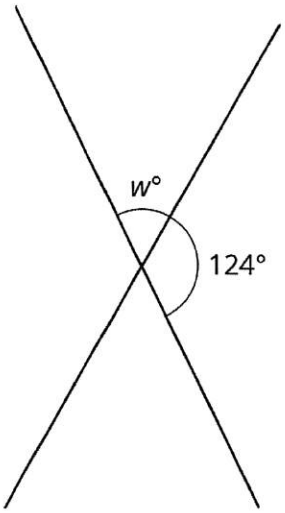
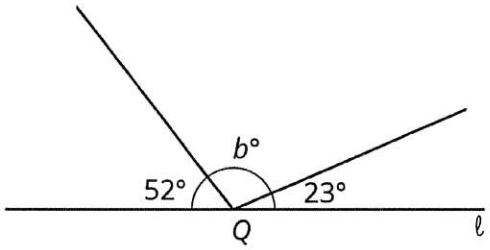
5.3 Calculate the Measure

Find the unknown angle measures. Show your thinking. Organize it so it can be followed by others.

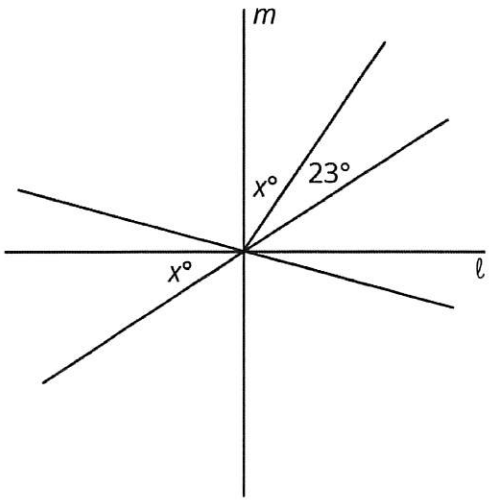
1.



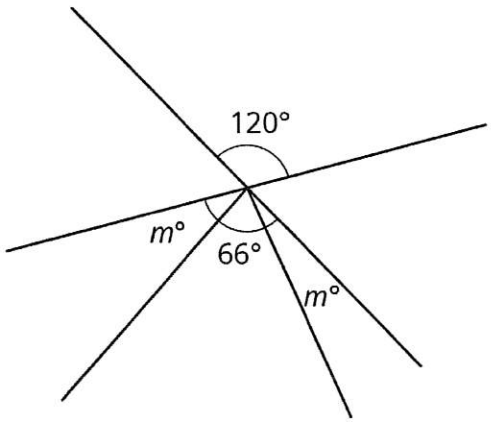
2.



3. Lines ℓ and m are perpendicular.



4.

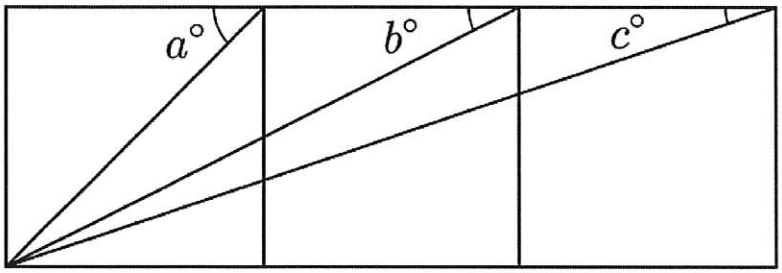


NAME DATE PERIOD

Are you ready for more?

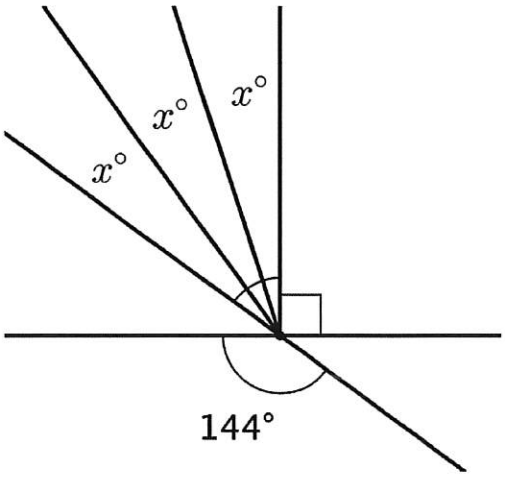
The diagram contains three squares. Three additional segments have been drawn that connect corners of the squares. We want to find the exact value of $a + b + c$.

1. Use a protractor to measure the three angles. Use your measurements to conjecture about the value of $a + b + c$.
2. Find the exact value of $a + b + c$ by reasoning about the diagram.



Lesson 5 Summary

To find an unknown angle measure, sometimes it is helpful to write and solve an equation that represents the situation. For example, suppose we want to know the value of x in this diagram.



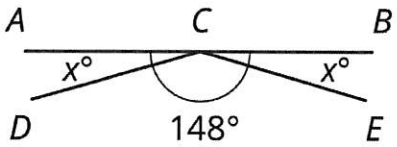
Using what we know about vertical angles, we can write the equation $3x + 90 = 144$ to represent this situation. Then we can solve the equation.

$$\begin{aligned} 3x + 90 &= 144 \\ 3x + 90 - 90 &= 144 - 90 \\ 3x &= 54 \\ 3x \cdot \frac{1}{3} &= 54 \cdot \frac{1}{3} \\ x &= 18 \end{aligned}$$

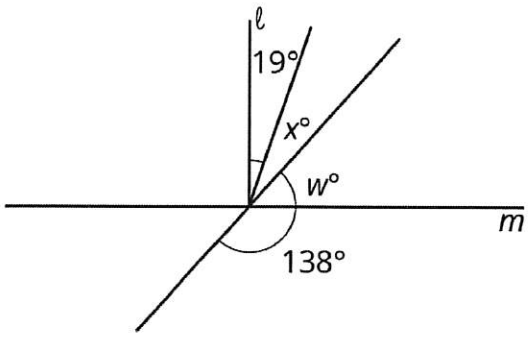
NAME DATE PERIOD

Unit 7, Lesson 5
Practice Problems

1. Segments AB, DC, and EC intersect at point C. Angle DCE measures $148°$. Find the value of x.



2. Line ℓ is perpendicular to line m. Find the value of x and w.



3. If you knew that two angles were complementary and were given the measure of one of those angles, would you be able to find the measure of the other angle? Explain your reasoning.

4. For each inequality, decide whether the solution is represented by $x < 4.5$ or $x > 4.5$.

   a. $-24 > -6(x - 0.5)$

   b. $-8x + 6 > -30$

   c. $-2(x + 3.2) < -15.4$

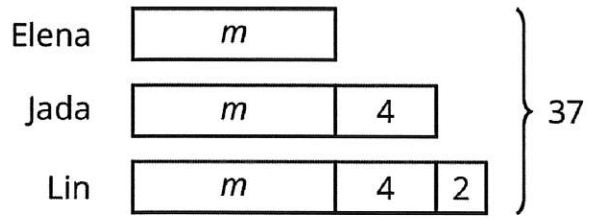
NAME DATE PERIOD

5. A runner ran $\frac{2}{3}$ of a 5 kilometer race in 21 minutes. They ran the entire race at a constant speed.

   a. How long did it take to run the entire race?

   b. How many minutes did it take to run 1 kilometer?

6. Jada, Elena, and Lin walked a total of 37 miles last week. Jada walked 4 more miles than Elena, and Lin walked 2 more miles than Jada. The diagram represents this situation:



   Find the number of miles that they each walked. Explain or show your reasoning.

7. Select **all** the expressions that are equivalent to $-36x + 54y - 90$.

   A. $-9(4x - 6y - 10)$

   B. $-18(2x - 3y + 5)$

   C. $-6(6x + 9y - 15)$

   D. $18(-2x + 3y - 5)$

   E. $-2(18x - 27y + 45)$

   F. $2(-18x + 54y - 90)$

Monday, April 6, 2020

Unit 7
Cool-downs

Angles, Triangles, and Prisms

Click on a title in the list below to scroll directly to that lesson.

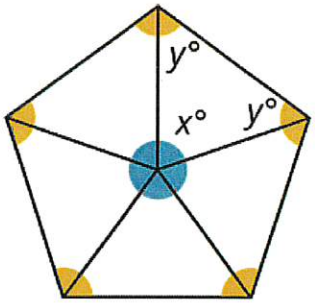
NAME DATE PERIOD

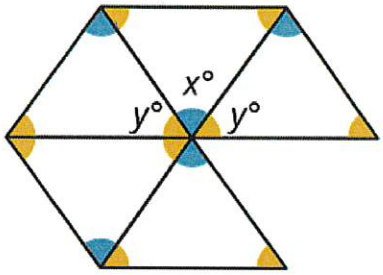
Unit 7, Lesson 1

Cool-down

1.5 Identical Isosceles Triangles

Here are two different patterns made out of the same five identical isosceles triangles. Without using a protractor, determine the measures of $\angle x$ and $\angle y$. Explain or show your reasoning.





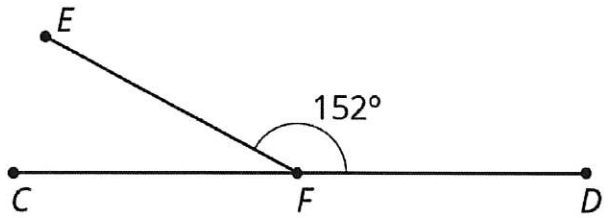
NAME DATE PERIOD

Unit 7, Lesson 2

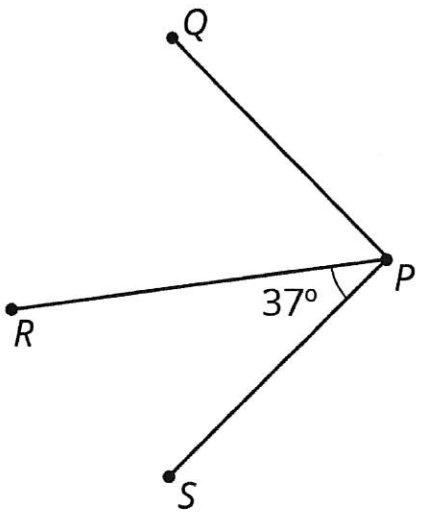
Cool-down

2.4 Finding Measurements

1. Point F is on line CD. Find the measure of angle CFE.



2. Angle SPR and angle RPQ are complementary. Find the measure of angle RPQ.

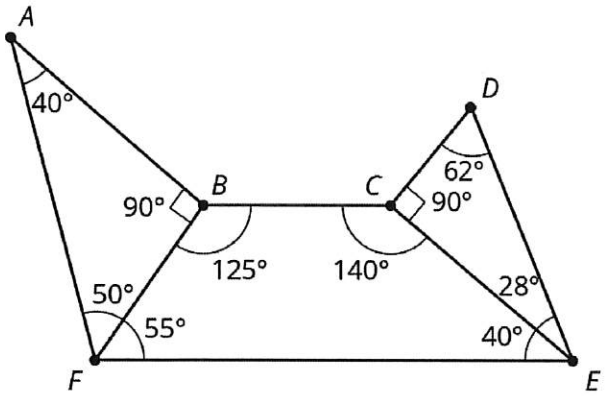


NAME DATE PERIOD

Unit 7, Lesson 3

Cool-down

3.5 Finding Angle Pairs



1. Name *two pairs* of complementary angles in the diagram.

2. Name *two pairs* of supplementary angles in the diagram.

3. Draw another angle to make a pair of vertical angles. Label your new angle with its measure.

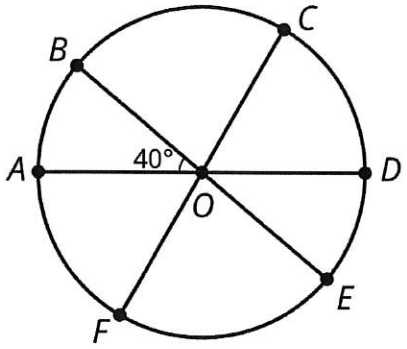
NAME DATE PERIOD

Unit 7, Lesson 4

Cool-down

4.4 Missing Circle Angles

AD, BE, and CF are all diameters of the circle. The measure of angle AOB is 40 degrees. The measure of angle DOF is 120 degrees.



Find the measures of the angles:

1. BOC

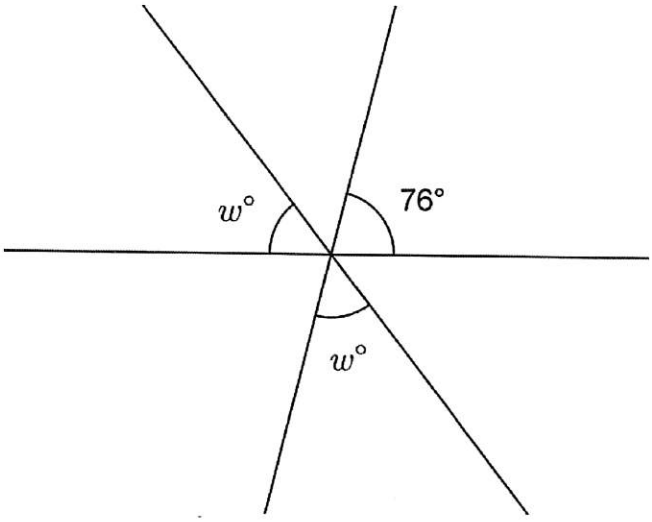
2. COD

NAME DATE PERIOD

Unit 7, Lesson 5
Cool-down

5.4 In Words

Here are three intersecting lines.



1. Write an equation that represents a relationship between these angles.

2. Describe, in words, the process you would use to find w.

NAME DATE PERIOD

Unit 8, Lesson 1

Mystery Bags

Let's make predictions based on what we know.

1.1 Going Fishing

Andre and his dad have been fishing for 2 hours. In that time, they have caught 9 bluegills and 1 yellow perch.

The next time Andre gets a bite, what kind of fish do you think it will be? Explain your reasoning.

1.2 Playing the Block Game

Your teacher will give your group a bag of colored blocks.

1. Follow these instructions to play one round of the game:
    a. Everyone in the group records the color written on the bag in the first column of the table.
    b. Without looking in the bag, one person takes out one of the blocks and shows it to the group.
    c. If they get a block that is the same color as the bag, they earn:
        - 1 point during round 1
        - 2 points during round 2
        - 3 points during round 3
    d. Next, they put the block back into the bag, shake the bag to mix up the blocks, and pass the bag to the next person in the group.
    e. Repeat these steps until everyone in your group has had 4 turns.

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2. At the end of the round, record each person's score in the table.

	What color bag?	person 1's score	person 2's score	person 3's score	person 4's score
round 1					
round 2					
round 3					

3. Pause here so your teacher can give you a new bag of blocks for the next round.

4. Repeat the previous steps to play rounds 2 and 3 of the game.

5. After you finish playing all 3 rounds, calculate the total score for each person in your group.

Are you ready for more?

Tyler's class played the block game using purple, orange, and yellow bags of blocks.

- During round 1, Tyler's group picked 4 purple blocks and 12 blocks of other colors.
- During round 2, Tyler's group picked 11 orange blocks and 5 blocks of other colors.
- During round 3, Tyler forgot to record how many yellow blocks his group picked.

For a final round, Tyler's group can pick one block from any of the three bags. Tyler's group decides that picking from the orange bag would give them the best chance of winning, and that picking from the purple bag would give them the worst chance of winning. What results from the yellow bag could have lead Tyler's group to this conclusion? Explain your reasoning.

NAME DATE PERIOD

Lesson 1 Summary

One of the main ways that humans learn is by repeating experiments and observing the results. Babies learn that dropping their cup makes it hit the floor with a loud noise by repeating this action over and over. Scientists learn about nature by observing the results of repeated experiments again and again. With enough data about the results of experiments, we can begin to predict what may happen if the experiment is repeated in the future. For example, a baseball player who has gotten a hit 33 out of 100 times at bat might be expected to get a hit about 33% of his times at bat in the future as well.

In some cases, we can predict the chances of things happening based on our knowledge of the situation. For example, a coin should land heads up about 50% of the time due to the symmetry of the coin.

In other cases, there are too many unknowns to predict the chances of things happening. For example, the chances of rain tomorrow are based on similar weather conditions we have observed in the past. In these situations, we can experiment, using past results to estimate chances.

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Unit 8, Lesson 1

Practice Problems

1. Lin is interested in how many of her classmates watch her favorite TV show, so she starts asking around at lunch. She gets the following responses:

yes	yes	yes	no	no	no	no
no	no	no	yes	no	no	no

If she asks one more person randomly in the cafeteria, do you think they will say "yes" or "no"? Explain your reasoning.

2. An engineer tests the strength of a new material by seeing how much weight it can hold before breaking. Previous tests have held these weights in pounds:

1,200	1,400	1,300	1,500	950	1,600	1,100

Do you think that this material will be able to hold more than 1,000 pounds in the next test? Explain your reasoning.

3. A company tests two new products to make sure they last for more than a year.
   - Product 1 had 950 out of 1,000 test items last for more than a year.
   - Product 2 had 150 out of 200 last for more than a year.

   If you had to choose one of these two products to use for more than a year, which one is more likely to last? Explain your reasoning.

4. Put these numbers in order from least to greatest.

   a. $\frac{1}{2}$

NAME DATE PERIOD

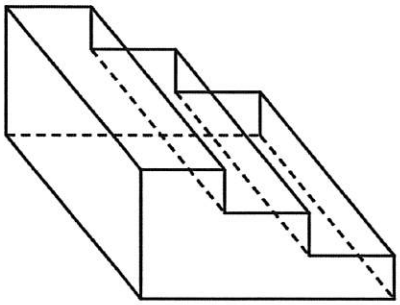
b. $\frac{1}{3}$

c. $\frac{2}{5}$

d. 0.6

e. 0.3

5. A small staircase is made so that the horizontal piece of each step is 10 inches long and 25 inches wide. Each step is 5 inches above the previous one. What is the surface area of this staircase?



NAME DATE PERIOD

Unit 8, Lesson 2

Chance Experiments

Let's investigate chance.

2.1 Which is More Likely?

Which is more likely to happen?

1. When reaching into a dark closet and pulling out one shoe from a pile of 20 pairs of shoes, you pull out a left shoe.

2. When listening to a playlist—which has 5 songs on it—in shuffle mode, the first song on the playlist plays first.

2.2 How Likely Is It?

1. Label each event with one of these options:

   impossible, unlikely, equally likely as not, likely, certain

   a. You will win grand prize in a raffle if you purchased 2 out of the 100 tickets.

   b. You will wait less than 10 minutes before ordering at a fast food restaurant.

   c. You will get an even number when you roll a standard number cube.

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d. A four-year-old child is over 6 feet tall.

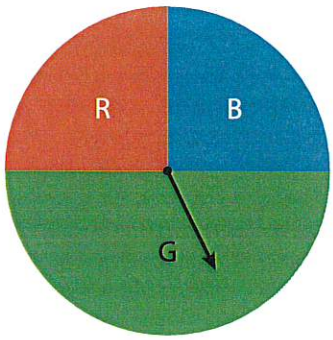
e. No one in your class will be late to class next week.

f. The next baby born at a hospital will be a boy.

g. It will snow at our school on July 1.

h. The sun will set today before 11:00 p.m.

i. Spinning this spinner will result in green.



j. Spinning this spinner will result in yellow.

2. Discuss your answers to the previous question with your partner. If you disagree, work to reach an agreement.

3. Invent another situation for each label, for a total of 5 more events.

2.3 Take a Chance **Optional: Only complete if digital version is avilable**

Interactive digital version available

a.openup.org/ms-math/en/s/ccss-7-8-2-3

Your teacher will have 2 students play a short game.

NAME DATE PERIOD

1. When the first person chose 3 numbers, did they usually win?

2. When the person chose 4 numbers, did you expect them to win? Why?

Are you ready for more?

On a game show, there are 3 closed doors. One door has a prize behind it. The contestant chooses one of the doors. The host of the game show, who knows where the prize is located, opens one of the *other* doors which does not have the prize. The contestant can choose to stay with their first choice or switch to the remaining closed door.

1. Do you think it matters if the contestant switches doors or stays?
2. Practice playing the game with your partner and record your results. Whoever is the host starts each round by secretly deciding which door has the prize.
   a. Play 20 rounds where the contestant always stays with their first choice.
   b. Play 20 more rounds where the contestant always switches doors.
3. Did the results from playing the game change your answer to the first question? Explain.

2.4 Card Sort: Likelihood

See set of cards on the following page.

1. Your teacher will give you some cards that describe events. Order the events from least likely to most likely.

2. After ordering the first set of cards, pause here so your teacher can review your work. Then, your teacher will give you a second set of cards.

3. Add the new set of cards to the first set so that all of the cards are ordered from least likely to most likely.

Set 1

The weather report says there is a 20% chance of rain tomorrow. The chance of rain tomorrow.	10% of people are left handed. The chance that a randomly chosen person is left handed.
The offspring of two fruit flies in a science experiment have a 75% chance of having red eyes. The chance that the first fly to hatch has red eyes.	Half of the cards in a deck are red and half are black. Shuffle the cards and select the first card. The chance that the card is red.

Set 2

2 out of every 5 dentists recommend a certain brand of toothpaste. The chance that a random dentist recommends the toothpaste.	The chance that your opponent will play rock first in a game of paper, rock, scissors.
A pile contains 6 square pattern blocks and you choose one. The chance that the block you choose has 4 sides of the same length.	A fishbowl contains 5 balls where each one has an even number from 2 to 10 written on it and you choose one. The chance that you draw out a ball with the number 3 on it.
In general English usage, $\frac{4}{25}$ of words begin with the letter T. The chance that a randomly chosen word in a novel begins with the letter T.	The probability that a certain medical test gives the right result is 0.95. The chance that this medical test is correct for a random patient.

NAME DATE PERIOD

Lesson 2 Summary

A **chance experiment** is something that happens where the outcome is unknown. For example, if we flip a coin, we don't know if the result will be a head or a tail. An **outcome** of a chance experiment is something that can happen when you do a chance experiment. For example, when you flip a coin, one possible outcome is that you will get a head. An **event** is a set of one or more outcomes.

We can describe events using these phrases:

- Impossible
- Unlikely
- Equally likely as not
- Likely
- Certain

For example, if you flip a coin:

- It is *impossible* that the coin will turn into a bottle of ketchup.
- It is *unlikely* the coin will land on its edge.
- It is *equally likely as not* that you will get a tail.
- It is *likely* that you will get a head or a tail.
- It is *certain* that the coin will land somewhere.

The *probability* of an event is a measure of the likelihood that an event will occur. We will learn more about probabilities in the lessons to come.

Glossary Terms

chance experiment

event

outcome

7th Grade

Week of 3/16	PD Day	Day 1		Day 2
Objective		SWBAT explain the difference between climate and weather and identify the components that define weather and climate (i.e. temperature, pressure, humidity, precipitation, and wind)		SWBAT review the water cycle SWBAT explain how gravity and the energy from the sun affect the water cycle
Assignment Read the pages assigned and answer any questions associated		p. 389 p. 462-463	p. 468-471 p. 300-301	p. 370-372 p. 460-461
To Be Graded		Day 1 Assignment		Day 2 Assignment

Week of 3/23	Day 3	Day 4
Objective	SWBAT explain the factors that affect climate	SWBAT explain how the geography of land, specifically mountains and altitude, affect rain and temperature patterns.
Assignment Read the pages assigned and answer any questions associated	Workbook pages 57-60	p. 392 Read about Rain Shadows
To Be Graded	Pages 59-60	Day 3 Assignment

Updated 3/18/2020

Week of 3/30	Day 5	Day 6	Day 7
Objective	SWBAT explain how the Earth's tilt causes unequal heating (temperatures) of the Earth creating latitudinal patterns	SWBAT explain how the ocean affects climates by: - Heating slower than land - Creating currents affecting the lands near them	SWBAT explain what makes up Earth's atmosphere and how the atmosphere contributes to the temperature on Earth.
Assignment Read the pages assigned and answer any questions associated	p. 390-391	In Readings Section p. 400-405 Article- Land Heats Faster than Water p. 1-2 Optional: Experiment	In Readings Section p. 416-419 p.434-437
To Be Graded	Day 4 Assignment	Day 6 Assignment p. 1-4 in Assignments Section	Day 7 Assignment p. 5-8 in Assignments Section

Week of 4/6	Day 8	Day 9
Objective	SWBAT explain how wind is created and how wind patterns are affected by the rotation of the Earth (Coriolis effect) SWBAT explain how wind contributes to weather patterns	**No Instruction Thursday/Friday Spring Break 4/9-4/13**
Assignment Read the pages assigned and answer any questions associated	In Readings Section p.442-448	
To Be Graded	Day 8 Assignment p. 9-12 in Assignments Section	

Updated 3/18/2020

READINGS

Why Does Land Heat and Cool Faster Than Water?

Land heats and cools faster than water for many different reasons. But one of the main reasons is the difference in molecular composition between land and water. Because of the movements of the molecules, it takes much longer for water to heat up or cool down. However, this is the simple answer, and there are more contributing factors. Read on to learn why water takes much longer to heat or cool, and also how this can affect weather patterns.

Water and Heat Conduction

Overall, water is a poor conductor of heat. When speaking about molecular composition, in part, this is what is meant. It takes much longer for water to conduct heat than it does land. Its molecules need to gain much more energy in order to heat up. Water also has a higher capacity for heat than land does. This is what is called "specific heat." Because of this, the solar power given off by the sun takes a much longer time to take effect — and water can get much hotter than regular landforms.

How Is Sand Warm and Ocean Water Cold?

The beach is a perfect example of how much more quickly land heats up than water. During the summer, sand can become so molten hot it's almost unbearable to walk on it, but ocean temperatures can still be icy cold. Land is a quick conductor of heat and energy, and therefore, land heats much faster. On the other hand, land loses its heat much faster. You can also look at the beach in the winter to see that there may be snow and ice on the beach, but of course, the ocean is not frozen.

More on Heating and Cooling

Land temperatures can easily vary by dozens of degrees during the day. An typical day during the spring or fall may have a low of 50 degrees Fahrenheit in the morning and a high of 80 in the afternoon. These air temperatures are not dissimilar from heating and cooling of land. However, during the day, water forms may only change in degree by a half degree, except for perhaps during the dog days of summer. Because of water's specific heat, water temperatures do not drop drastically at night but stay marginally the same, while land and air temperatures drop significantly during all seasons.

Why Are Coastal Areas Cooler?

You may notice that in the summer, inland temperatures may be scorching hot, while coastal areas remain cooler. This is directly caused by the ocean. Because water heats and cools more slowly and oceans only change by small amounts throughout the day or season, coastal areas remain cooler. In fact, heating and cooling differences between land and water affect the climate everywhere on earth.

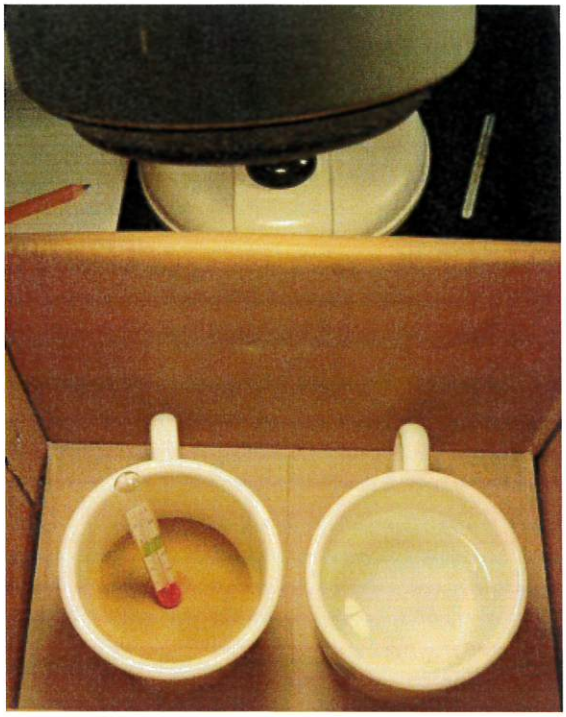
Land and Water Are Affected by Color

The heating differences between land and water are affected by other reasons beyond water's molecular composition and specific heat. Color also matters. Darker materials have a tendency to absorb more radiation (sun energy), and this, in turn, can make land masses hotter. As water is lighter in color than land as it is clear, it absorbs much less of the sun's rays.

Land and Water Are Also Affected by Texture

Texture also has a lot to do with the differences in heating and cooling of land and water. Rough, dry materials absorb more heat. When we talk about land, it's not just the landforms themselves. Cities make up quite a big part of the earth, and they are often mainly composed of asphalt and concrete, which both absorb more radiation. You can test this out by walking on a hot sidewalk and then walking in the grass beside it.

Specific Heat of Water vs. Specific Heat of Sand



Your feet may already know what **specific heat** is: Your toes felt nice and cool in the ocean on a summer day. Then, you decided to walk *barefoot* to the ice cream stand. The sand was much warmer than the ocean. The last part of the walk was the paved parking lot. Ouch! That black asphalt was hot. Your feet made you promise to throw on some flip flops next time.

Why, on the same day, are the temperatures of water, sand, and asphalt so different? Specific heat is the key. **Specific heat** is how much heat energy is needed raise the temperature of a substance. Water has a very high specific heat. That means it needs to absorb a lot of energy before its temperature changes. Sand and asphalt, on the other hand, have lower specific heats. This means that their temperatures change more quickly. When the summer sun shines down on them, they quickly become hot. In this experiment, you will use a light to add heat to samples of sand and water. Using a thermometer, you will be able to measure how much the temperature of each changes in a given amount of time.

Problem: How can the specific heats of different substances be observed and measured?

Materials

- Desk lamp
- Box
- Box cutter or scissors
- 2 non-paper cups
- 2 thermometers
- Sand
- Water

Procedure

1. Have a grown-up help you cut off one side of the box. You want to keep the heat energy of lamp enclosed in the area of your experiment as much as possible.
2. Fill one of the cups with sand and the other with water at room temperature.
3. Place the cups side by side in the bottom of the box.
4. Place the lamp behind the box and tilt the head so that when you turn it on, the light will shine down towards the cups. The bulb should be an equal distance away from each cup. *Why is this important?*
5. Do not turn your lamp on yet.
6. Place a thermometer about one inch into the sand. Place a second thermometer about one inch into the water.
7. Record the initial temperatures of the sand and water in a data table similar to the following.

Time in Minutes	Temperature Water	Temperature Sand
0		
2		
4		
6		
8		
10		
12		

16		
18		
20		

8. Turn on the light.
9. Record the temperature of both the sand and water every two minutes for at least 20 minutes. Be careful that the cups don't melt under the light bulb. If the temperatures don't seem like they're changing very much, try moving the light closer to the cups or using a light bulb of higher wattage.

Results

The sand will get warmer faster than the water.

Why?

It was important to make sure that the light was the same distance from the sand and water because you wanted each cup to receive the same amount of energy from the light. This is a **controlled experiment**, and the only variable you want to test is type of substance in the cup. Part of the reason the sand got hotter faster is because the specific heat of sand is lower than the specific heat of water. That's why it took less light energy to change its temperature.

Going Further

What other properties determine how fast a substance heats up? Try the same experiment with light and dark rock, or different types of liquids. You might also do the experiment in reverse, measuring how different substances cool over time.

Louisiana

LESSON 3

Currents and Climate

UNLOCK THE BIG ?

- What Causes Surface Currents?
  GLE 24 (ESS-M-A10); 25 (ESS-M-A11)
- What Causes Deep Currents?
  GLE 24 (ESS-M-A10); 25 (ESS-M-A11)

MY PLANET DIARY

EVERYDAY SCIENCE

Ducky Overboard

What happens when a ship loses its cargo at sea? Is it gone forever? You might think so. One ship traveling from Hong Kong to Tacoma, Washington, lost 29,000 plastic toys. They fell overboard in a storm and were considered lost at sea. But when hundreds of the toys began washing up on distant shores, scientists got excited.

One way scientists study ocean currents is by releasing empty bottles into the ocean. But of 500 to 1,000 bottles released, scientists might only recover 10. That doesn't give them much data. The large number of floating toys could give scientists better data from more data points.

The first toys were spotted off the coast of Alaska. Then beachcombers began finding them in Canada, in Washington, and even as far away as Scotland.

Discuss these questions with a classmate and write your answers below.

1. Why was the plastic toy spill so helpful to scientists studying ocean currents?

2. Have you ever found objects on the beach? What data would scientists need from you for their research?

PLANET DIARY Go to **Planet Diary** to learn more about ocean currents.

Lab zone® Do the Inquiry Warm-Up *Bottom to Top.*

Vocabulary

- current
- Coriolis effect
- climate
- El Niño
- La Niña

Skills

- Reading: Compare and Contrast
- Inquiry: Infer

What Causes Surface Currents?

A **current** is a large stream of moving water that flows through the oceans. Unlike waves, currents carry water from one place to another. Some currents move water at the surface of the ocean. Other currents move water deep in the ocean.

Surface currents affect water to a depth of several hundred meters. They are driven mainly by winds. Surface currents follow Earth's major wind patterns. They move in circular patterns in the five major oceans. Most of the currents flow east or west, then double back to complete the circle, as shown in **Figure 1.**

Coriolis Effect Why do the currents move in these circular patterns? If Earth were standing still, winds and currents would flow in more direct paths between the poles and the equator. But as Earth rotates, the paths of the winds and currents curve. This effect of Earth's rotation on the direction of winds and currents is called the **Coriolis effect** (kawr ee OH lis). In the Northern Hemisphere, the Coriolis effect causes the currents to curve clockwise. In the Southern Hemisphere, the Coriolis effect causes the currents to curve counterclockwise.

Grade 8 Grade Level Expectations

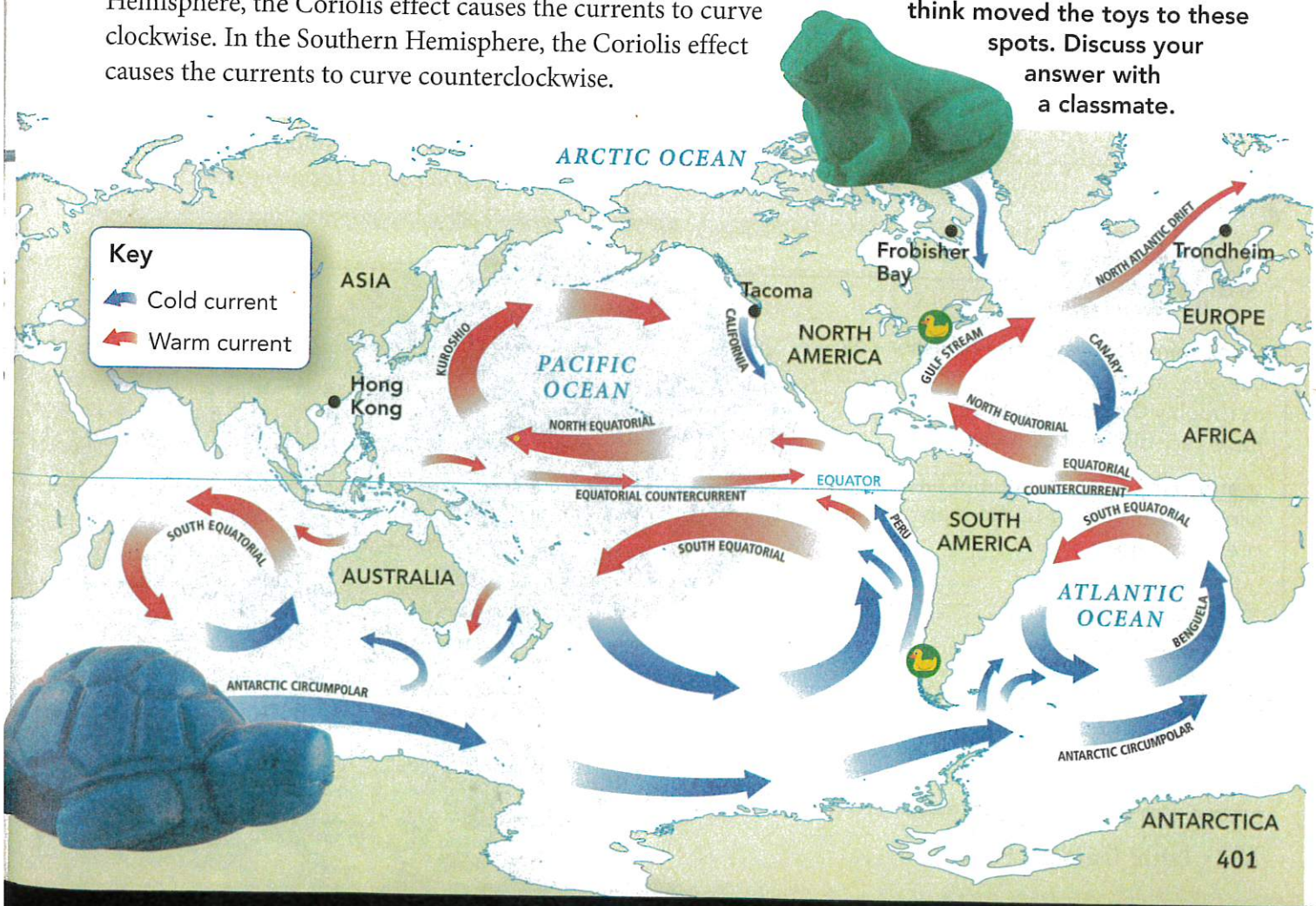
GLE 24 Investigate and explain how given factors affect the rate of water movement in the water cycle (e.g., climate, type of rock, ground cover). (ESS-M-A10)

GLE 25 Explain and give examples of how climatic conditions on Earth are affected by the proximity of water. (ESS-M-A11)

FIGURE 1

Surface Currents

Infer The toys that fell overboard washed up in many places. Two of the locations are marked with ducks below. Circle the currents that you think moved the toys to these spots. Discuss your answer with a classmate.



Compare and Contrast Use the space below to compare and contrast the effects of warm and cold currents on climate.

Gulf Stream

The Gulf Stream is the largest and most powerful surface current in the North Atlantic Ocean. This current is caused by strong winds from the west. It is more than 30 kilometers wide and 300 meters deep. The Gulf Stream moves warm water from the Gulf of Mexico to the Caribbean Sea. It then continues northward along the east coast of the United States. Near Cape Hatteras, North Carolina, it curves eastward across the Atlantic, as a result of the Coriolis effect. When the Gulf Stream crosses the Atlantic it becomes the North Atlantic Drift.

Effects on Climate

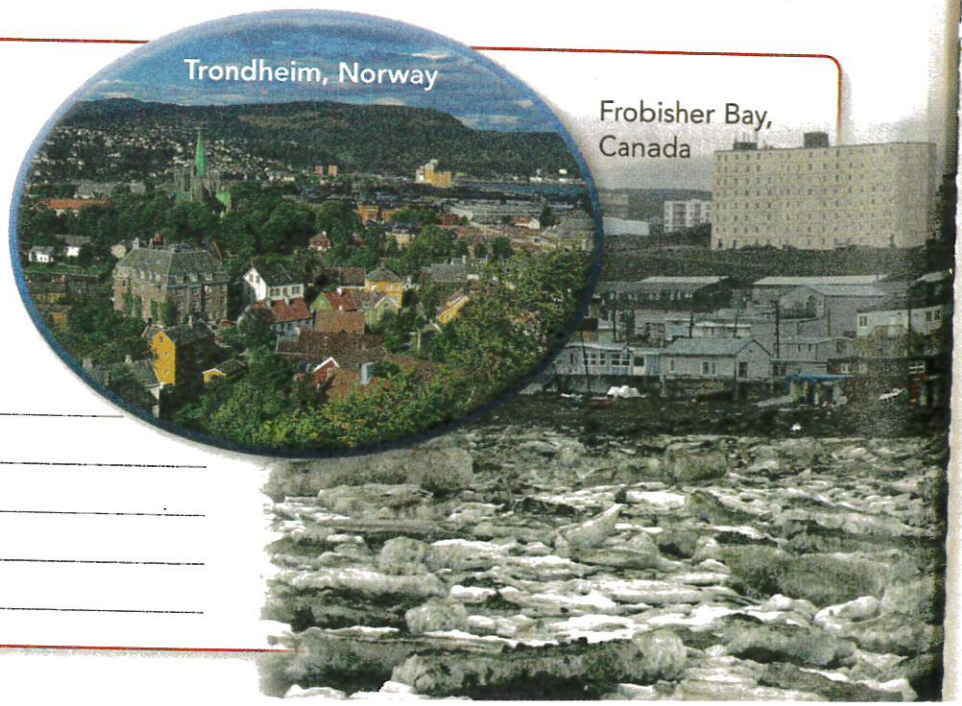
The Gulf Stream has a warming effect on the climate of nearby land areas. **Climate** is the pattern of temperature and precipitation typical of an area over a long period of time. The mid-Atlantic region of the United States, including North Carolina and Virginia, has a more moderate climate because of the Gulf Stream. Winters are very mild and summers are humid.

Currents affect climate by moving cold and warm water around the globe. Currents generally move warm water from the tropics toward the poles and bring cold water back toward the equator. **A surface current warms or cools the air above it. This affects the climate of land near the coast.** Winds pick up moisture as they blow across warm-water currents. This explains why the warm Kuroshio Current brings mild, rainy weather to the southern islands of Japan. Cold-water currents cool the air above them. Cold air holds less moisture than warm air. So cold currents tend to bring cool, dry weather to land areas in their path.

apply it!

Trondheim, Norway, and Frobisher Bay, Canada, are shown here in July. They are at roughly the same latitude, but they have very different climates.

Infer Why does Trondheim have a mild climate? *Hint:* Refer to the map on the previous page.



El Niño Changes in wind patterns and currents can have a major impact on the oceans and nearby land. One example of such changes is **El Niño,** a climate event that occurs every two to seven years in the Pacific Ocean. El Niño begins when an unusual pattern of winds forms over the western Pacific. This causes a vast sheet of warm water to move east toward the South American coast, as shown in **Figure 2.** This warm water prevents the cold deep water from moving to the surface. El Niño conditions can last for one to two years before the usual winds and currents return.

El Niño causes shifts in weather patterns. This leads to unusual and often severe conditions in different areas. A major El Niño occurred between 1997 and 1998. It caused an especially warm winter in the northeastern United States. It was also responsible for heavy rains, flooding, and mudslides in California, as well as a string of deadly tornadoes in Florida.

La Niña When surface waters in the eastern Pacific are colder than normal, a climate event known as **La Niña** occurs. A La Niña event is the opposite of an El Niño event. La Niña events typically bring colder than normal winters and greater precipitation to the Pacific Northwest and the north central United States.

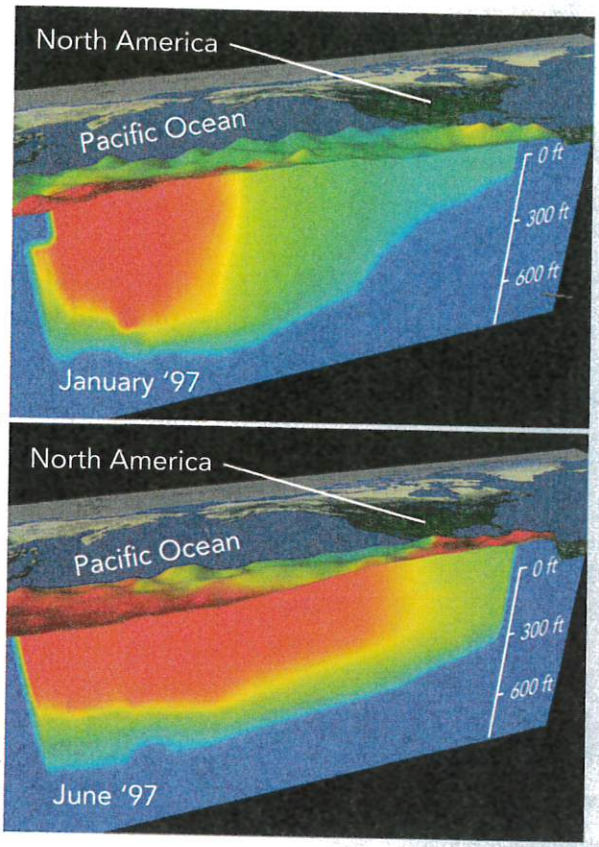


FIGURE 2

ART IN MOTION **Warming Sea Temperature**
The images show what happens to temperature below the surface of the ocean during an El Niño event. Red indicates a warmer sea surface temperature.

Draw Conclusions **What happened to the the water temperature over six months?**

_____

_____

Lab zone® Do the Lab Investigation *Modeling Ocean Currents.*

Assess Your Understanding

1a. Define What is a current?

_____

_____ GLE 24

b. Describe What causes surface currents?

_____ GLE 25

c. CHALLENGE Why is it helpful to a community to be able to predict an El Niño event?

_____

_____

_____ GLE 25

got it?

○ I get it! Now I know that currents are driven mainly by _____

_____

○ I need extra help with _____

Go to my science coach *online for help with this subject.* GLE 24, 25

Grade 8 Grade Level Expectations

GLE 24 Investigate and explain how given factors affect the rate of water movement in the water cycle (e.g., climate, type of rock, ground cover). (ESS-M-A10)

GLE 25 Explain and give examples of how climatic conditions on Earth are affected by the proximity of water. (ESS-M-A11)

What Causes Deep Currents?

Deep below the ocean surface, another type of current causes chilly waters to creep slowly across the ocean floor. **Deep currents are caused by differences in the density of ocean water.** Recall that cold water is more dense than warm water.

Salinity When a warm surface current moves from the equator toward one of the poles, it gradually cools. As ice forms near the poles, the salinity of the water increases from the salt left behind during freezing. As the water's temperature decreases and its salinity increases, the water becomes denser and sinks. Then, the cold water flows back along the ocean floor as a deep current. Deep currents are affected by the Coriolis effect, which causes them to curve.

Deep currents move and mix water around the world. They carry cold water from the poles toward the equator. Deep currents flow slowly. They may take as long as 1,000 years to circulate between the oceans back to where they started.

Global Ocean Conveyor The simplified pattern of ocean currents in **Figure 3** looks like a conveyor belt, moving water between the oceans. This pattern of ocean currents results from density differences due to temperature and salinity. The currents bring oxygen into the deep ocean that is needed for marine life.

The ocean's deep currents mostly start as cold water in the North Atlantic Ocean. This is the same water that moved north across the Atlantic as part of the Gulf Stream. This cold, salty water, called the North Atlantic Deep Water, is dense. It sinks to the bottom of the ocean and flows southward toward Antarctica. From there it flows northward into both the Indian and Pacific oceans. The deep cold water rises to the surface in the Indian and Pacific oceans, warms, and eventually flows back along the surface into the Atlantic.

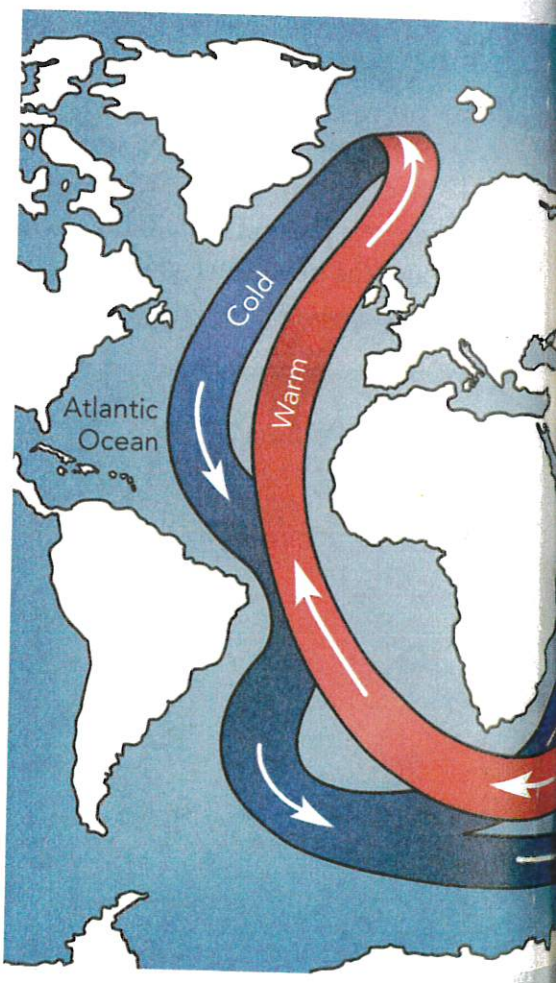


FIGURE 3
Global Conveyor
Predict What might happen if the global conveyor stopped?

do the math! Analyzing Data

Calculating Density

Temperature affects the density of ocean water. To calculate the density of a substance, divide the mass of the substance by its volume.

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Practice Problem

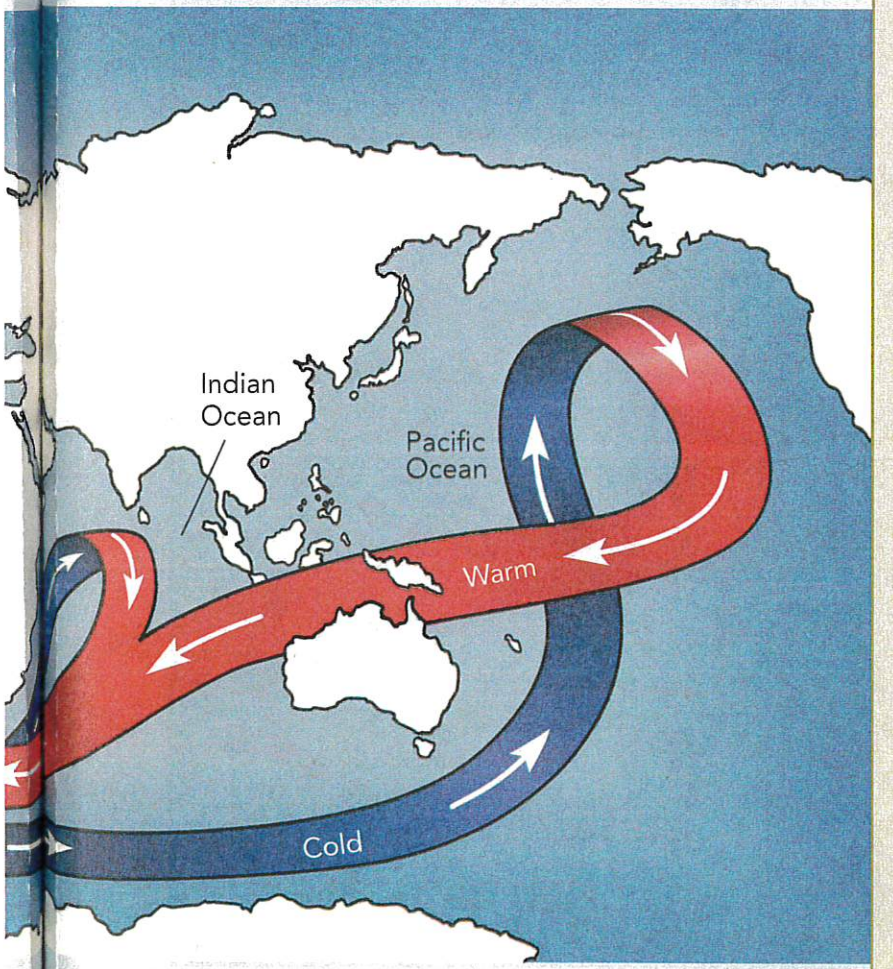
Calculate Find the density of the following 1-L samples of ocean water. Sample A has a mass of 1.01 kg; Sample B has a mass of 1.06 kg. Which sample is likely to have the higher salinity? Why?

_____

_____

_____

Mathematics GLE 18 (M-1-M) (N-8-M) (M-6-M)



Lab zone® Do the Quick Lab *Deep Currents.*

Assess Your Understanding

2a. Review What causes deep currents?

_____

_____

GLE 24

b. Explain How does the temperature of ocean water affect its density?

_____

_____

_____

_____

GLE 25

got it?

○ **I get it!** Now I know how the global ocean conveyor moves: _____

_____

_____

_____

○ I need extra help with _____

Go to my science coach *online for help with this subject.*

GLE 24, 25

Louisiana

LESSON 1

The Air Around You

UNLOCK THE BIG ?

- What Is the Composition of Earth's Atmosphere?
  GLE 26 (ESS-M-A11)
- How Is the Atmosphere a System?
  GLE 27 (ESS-M-A12)

MY PLANET DIARY

VOICES FROM HISTORY

Antoine Lavoisier

French chemist Antoine Lavoisier was determined to solve a puzzle: How could a metal burned to a powder weigh more than the original metal? In his 1772 lab notes he observed, "Sulphur, in burning . . . gains weight." So did mercury. Lavoisier thought a gas in the air was combining with the mercury as it burned, making it heavier. Then he heated the mercury powder to a higher temperature. It turned back to liquid mercury and a gas. Lavoisier observed that a mouse exposed to the gas could breathe it. He named the gas *principe oxygine*. Today we call it oxygen.

Discuss Lavoisier's experiment with a partner and answer the question below.

Why do you think Lavoisier exposed a mouse to the gas he collected from the mercury?

_____

_____

_____

PLANET DIARY Go to **Planet Diary** to learn more about air.

Lab zone® Do the Inquiry Warm-Up *How Long Will the Candle Burn?*

Grade 8 Grade Level Expectation

GLE 26 Describe and illustrate the layers of Earth's atmosphere. (ESS-M-A11)

What Is the Composition of Earth's Atmosphere?

The sun disappears behind thick, dark clouds. In the distance you see a bright flash. Then you hear a crack of thunder. You make it home just as the downpour begins. The weather changed quickly—that was close!

Weather is the condition of Earth's atmosphere at a particular time and place. But what is the atmosphere? Earth's **atmosphere** (AT muh sfeer) is the envelope of gases that surrounds the planet.

Earth's atmosphere consists of nitrogen, oxygen, carbon dioxide, water vapor, and other gases, as well as particles of liquids and solids.

Vocabulary

- weather
- atmosphere
- water vapor

Skills

Reading: Summarize

Inquiry: Infer

Nitrogen The most abundant gas in the atmosphere is nitrogen. It makes up a little more than three fourths of the air we breathe. Nitrogen occurs in all living things and makes up about 3 percent of the weight of the human body.

Oxygen Although oxygen is the second most abundant gas in the atmosphere, it makes up only about 21 percent of the volume. Plants and animals take oxygen directly from the air and use it to release energy from their food.

Oxygen is also involved in many other processes. A fire uses oxygen rapidly as it burns. Without oxygen, a fire will go out. Some processes use oxygen more slowly. Steel in cars and other objects reacts slowly with oxygen to form iron oxide, or rust.

Carbon Dioxide Carbon dioxide makes up much less than 1 percent of the atmosphere, but it is essential to life. Plants must have carbon dioxide to produce food. The cells of animals break down food and give off carbon dioxide as a waste product.

When fuels like coal and gasoline are burned, they also release carbon dioxide. Burning these fuels increases the amount of carbon dioxide in the atmosphere.

Other Gases Oxygen and nitrogen together make up 99 percent of dry air. Argon makes up most of the other 1 percent. The remaining gases are called trace gases because only small amounts of them are present.

FIGURE 1

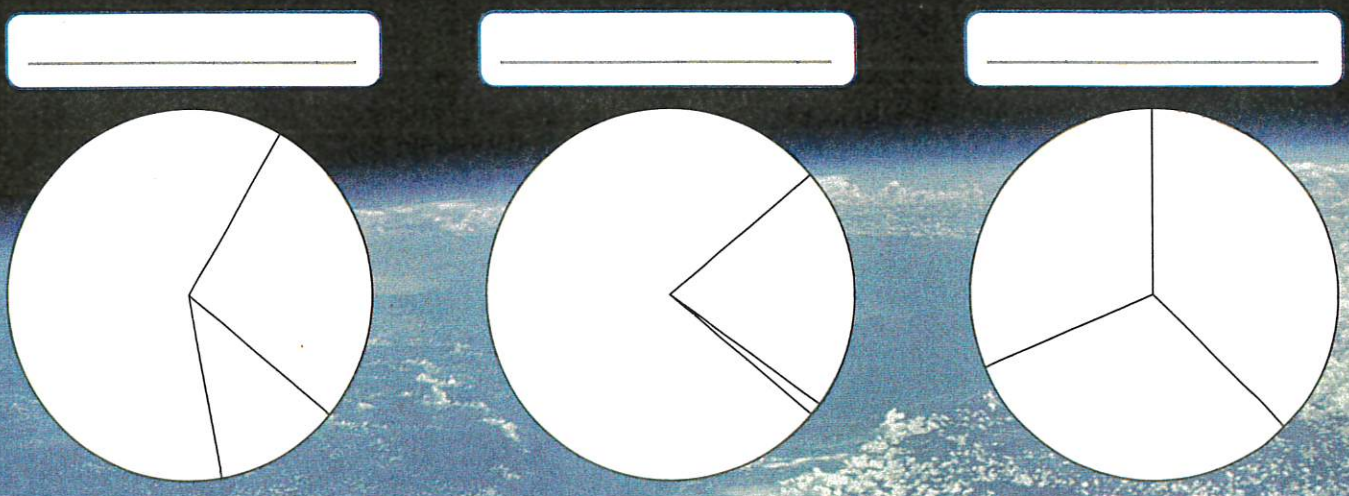
Gases in the Air

The atmosphere is a thin layer of gases.

Graph **Identify which circle graph shows the correct percentage of gases in the atmosphere. Shade in the key and the graph. Give your graph a title.**

Key

- ☐ Nitrogen
- ☐ Oxygen
- ☐ Other gases



apply it!

The amount of water vapor in the air can differ from place to place.

1. There is more water vapor in the (desert/rain forest) than in the (desert/rain forest).

2. **Infer** What evidence do you see for your answer to Question 1?

_____

_____

_____

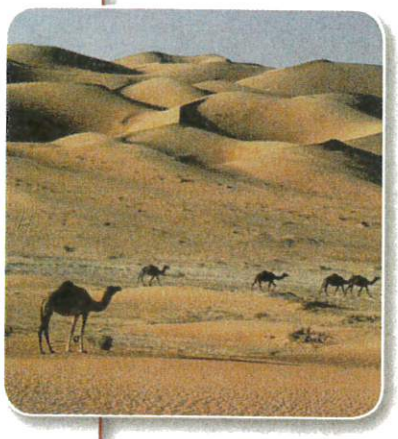
_____

3. **CHALLENGE** What factors might affect the amount of water vapor in the air?

_____

_____

_____



Water Vapor

So far, we've discussed the composition of dry air. But in reality, air is not dry. Air contains **water vapor**—water in the form of a gas. Water vapor is invisible. It is not the same thing as steam, which is made up of tiny droplets of liquid water.

The amount of water vapor in the air varies greatly from place to place and from time to time. Water vapor plays an important role in Earth's weather. Clouds form when water vapor condenses out of the air to form tiny droplets of liquid water or crystals of ice. If these droplets or crystals become heavy enough, they fall as rain or snow.

Particles

Pure air contains only gases. But pure air exists only in laboratories. In the real world, air contains tiny solid and liquid particles of dust, smoke, salt, and chemicals. You can see some of these particles in the air around you, but most of them are too small to see.

Lab zone® Do the Quick Lab *Breathe In, Breathe Out.*

Assess Your Understanding

1a. Define The _____ is the envelope of _____ that surrounds Earth. GLE 26

b. List What are the four most common gases in dry air?

_____

_____ GLE 26

c. Compare and Contrast What is the difference between wet air and dry air?

_____

_____ GLE 26

got it?

○ I get it! Now I know that the atmosphere is made up of _____

_____

_____

_____

_____

○ I need extra help with _____

_____

Go to my science coach *online for help with this subject.* GLE 26

How Is the Atmosphere a System?

Grade 8 Grade Level Expectation

GLE 27 Identify different air masses, jet streams, global wind patterns, and other atmospheric phenomena and describe how they relate to weather events, such as El Niño and La Niña. (ESS-M-A12)

The atmosphere is a system that interacts with other Earth systems, such as the ocean. The atmosphere has many different parts. Some of these parts you can actually see, such as clouds. But most parts of the atmosphere—like air, wind, and energy—you can't see. Instead, you might feel a wind when it blows on you. Or you might feel energy from the sun warming your face on a cool winter day.

At first, the wind that blows and the heat you feel may seem unrelated. But as you'll learn, the different parts of the atmosphere interact with one another. **Events in one part of the atmosphere affect other parts of the atmosphere.**

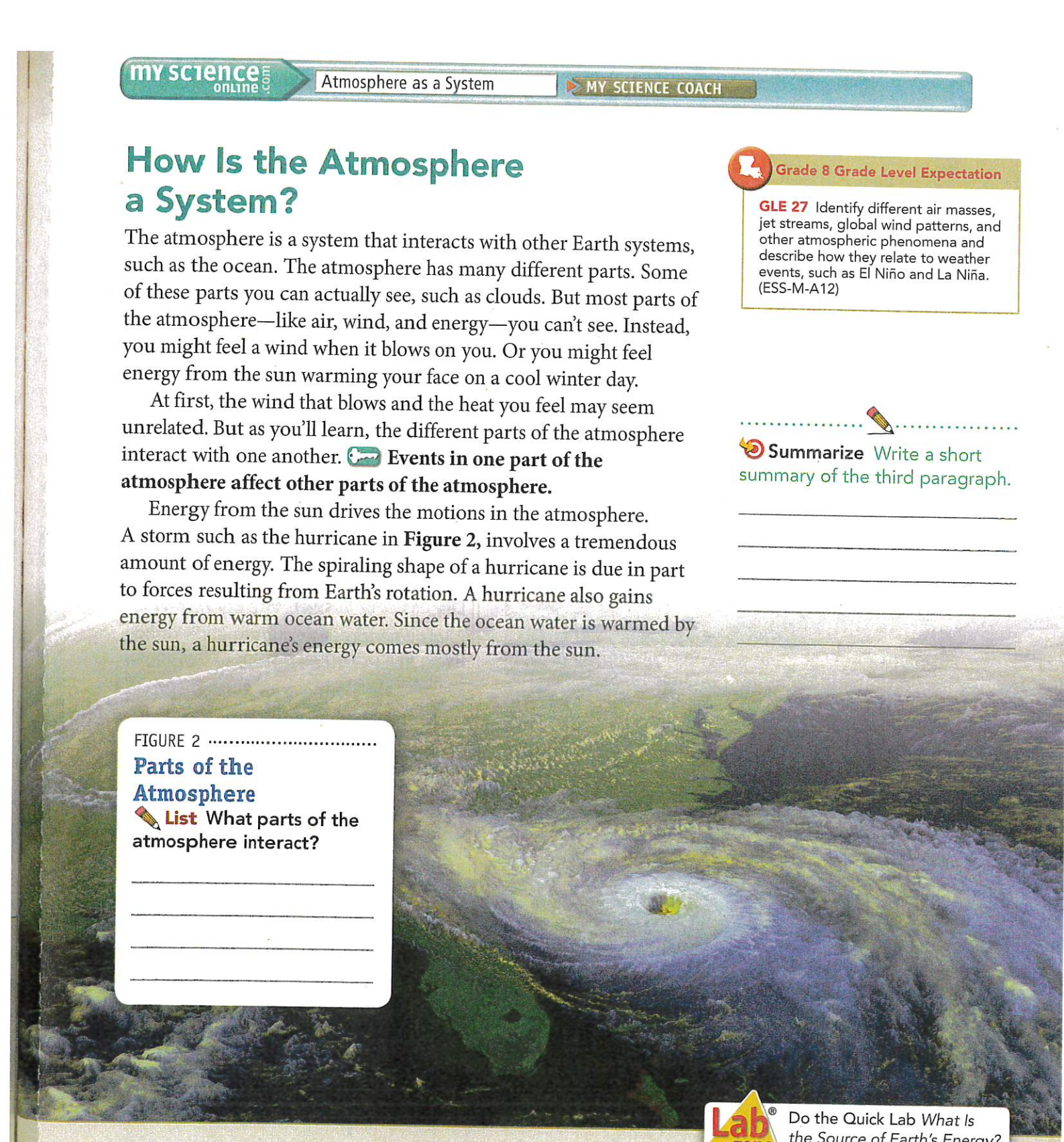
Energy from the sun drives the motions in the atmosphere. A storm such as the hurricane in **Figure 2,** involves a tremendous amount of energy. The spiraling shape of a hurricane is due in part to forces resulting from Earth's rotation. A hurricane also gains energy from warm ocean water. Since the ocean water is warmed by the sun, a hurricane's energy comes mostly from the sun.

Summarize Write a short summary of the third paragraph.

FIGURE 2

Parts of the Atmosphere

List What parts of the atmosphere interact?



Lab zone® Do the Quick Lab *What Is the Source of Earth's Energy?*

Assess Your Understanding

got it?

- ○ I get it! Now I know that events in one part of the atmosphere _____
- ○ I need extra help with _____

Go to my science coach *online for help with this subject.*

GLE 27

Grade 8 Grade Level Expectation

GLE 27 Identify different air masses, jet streams, global wind patterns, and other atmospheric phenomena and describe how they relate to weather events, such as El Niño and La Niña. (ESS-M-A12)

What Happens to the Sun's Energy When It Reaches Earth?

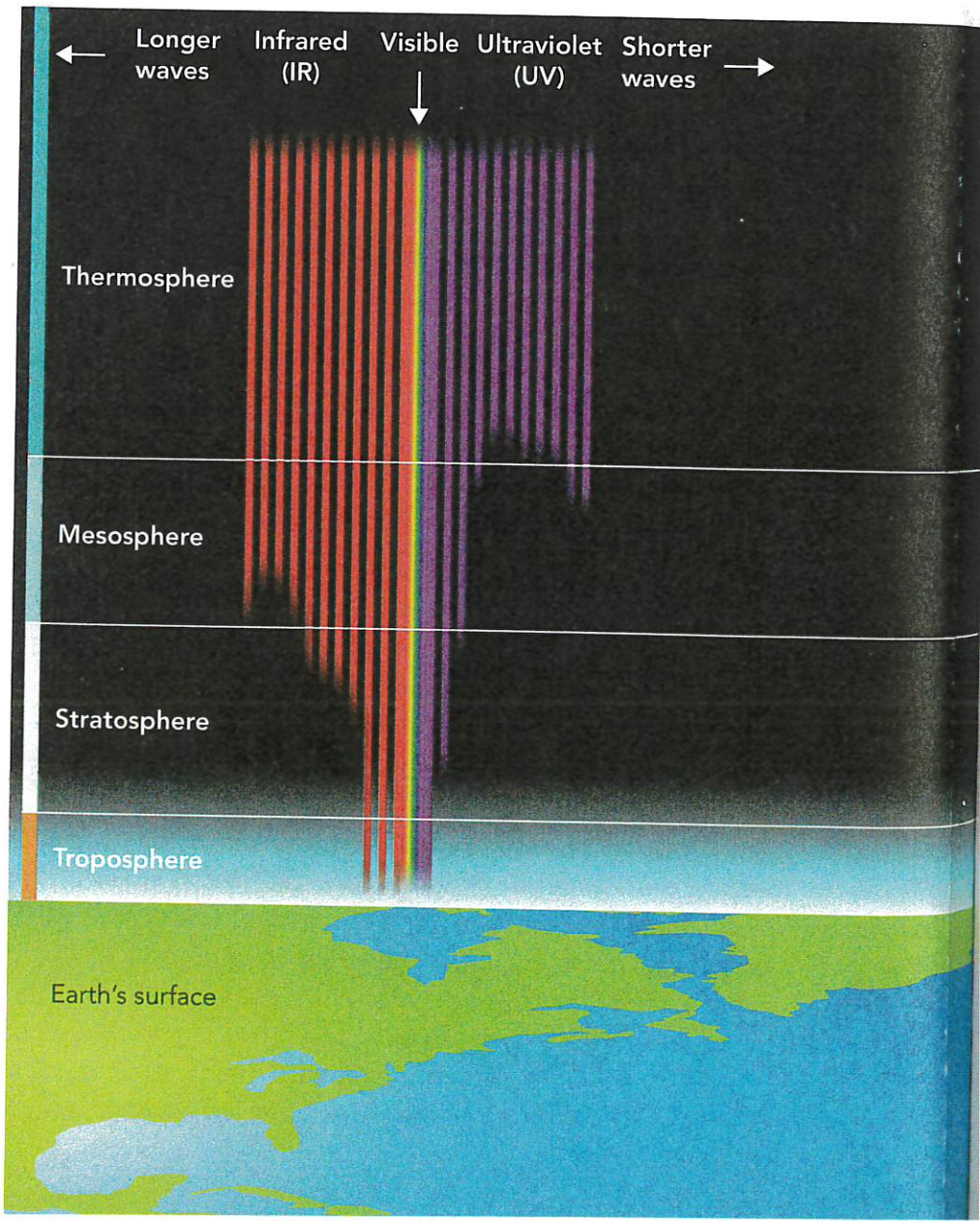
Sunlight must pass through the atmosphere before it reaches Earth's surface. The path of the sun's rays is shown in **Figure 2.** **Some sunlight is absorbed or reflected by the atmosphere before it can reach the surface. The rest passes through the atmosphere to the surface.**

Upper Atmosphere Different wavelengths of radiation are absorbed by different layers in the atmosphere. For example, some ultraviolet radiation is absorbed by the ozone layer in the stratosphere. Infrared radiation penetrates farther into the atmosphere before some of it is absorbed by water vapor and carbon dioxide.

FIGURE 2

Energy in the Atmosphere
Some wavelengths reach Earth's surface. Other wavelengths are completely or partially absorbed in the atmosphere.

Compare and Contrast
What happens to the radiation as it passes through Earth's atmosphere?



Troposphere Clouds act as mirrors, reflecting sunlight back into space. Dust-size particles and gases in the atmosphere disperse light in all directions, a process called **scattering.** When you look at the sky, the light you see has been scattered by gas molecules in the atmosphere. Gas molecules scatter short wavelengths of visible light (blue and violet) more than long wavelengths (red and orange). Scattered light looks bluer than ordinary sunlight. That's why the clear daytime sky looks blue.

Earth's Surface It may seem like a lot of the sun's energy is absorbed by gases in the atmosphere or reflected by clouds and particles. However, about 50 percent of the energy that reaches Earth's surface is absorbed by land and water and changed into heat. Look at **Figure 3** to see what happens to incoming sunlight at Earth's surface.

Ask Questions Before you read, preview the headings on these two pages. Ask a question you'd like to have answered. After you read, answer your question.

_____

_____

_____

_____

_____

_____

apply it!

The materials at Earth's surface shown below reflect different amounts of energy.

1 **Graph** Use the higher percentages below to draw a bar graph. Give it a title.

2 Based on your graph, which material reflects the most sunlight? Which absorbs the most?

_____

3 **CHALLENGE** Predict what might happen if a forested area was replaced with an asphalt parking lot.

_____

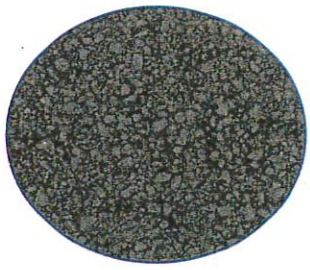
_____

_____

_____

Percent Reflected

Asphalt | Fresh snow | Deciduous forest | Dry soil



Asphalt
5–10% reflected

Fresh snow
80–90% reflected

Deciduous forest
15–20% reflected

Dry soil
20–25% reflected

FIGURE 3

Energy at Earth's Surface

Identify What's happening to energy in the lower atmosphere and at Earth's surface? Find out by using the words in the word bank below to complete each sentence.

Word Bank

reflected absorbed radiated

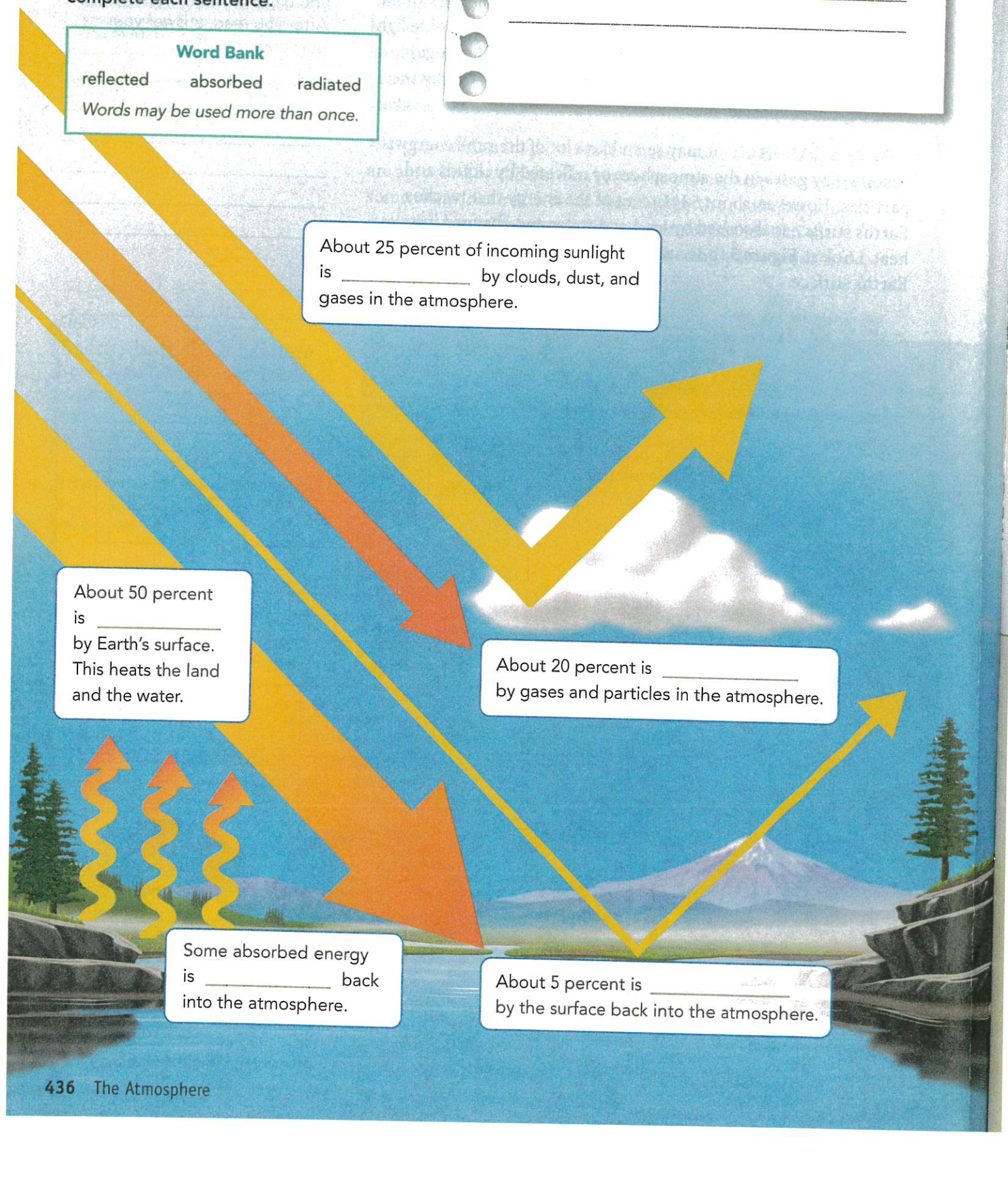
Words may be used more than once.

Draw Conclusions Using the diagram below, draw a conclusion about energy at Earth's surface.

_____

_____

_____



Earth's Energy Budget

What happens to the energy that heats the land and water? **Earth's surface radiates some energy back into the atmosphere as infrared radiation.** Much of this infrared radiation doesn't immediately travel all the way back into space. Instead, it's absorbed by water vapor, carbon dioxide, methane, and other gases in the air. The energy from the absorbed radiation heats the gases in the air. These gases in turn hold heat in Earth's atmosphere in a process called the **greenhouse effect.**

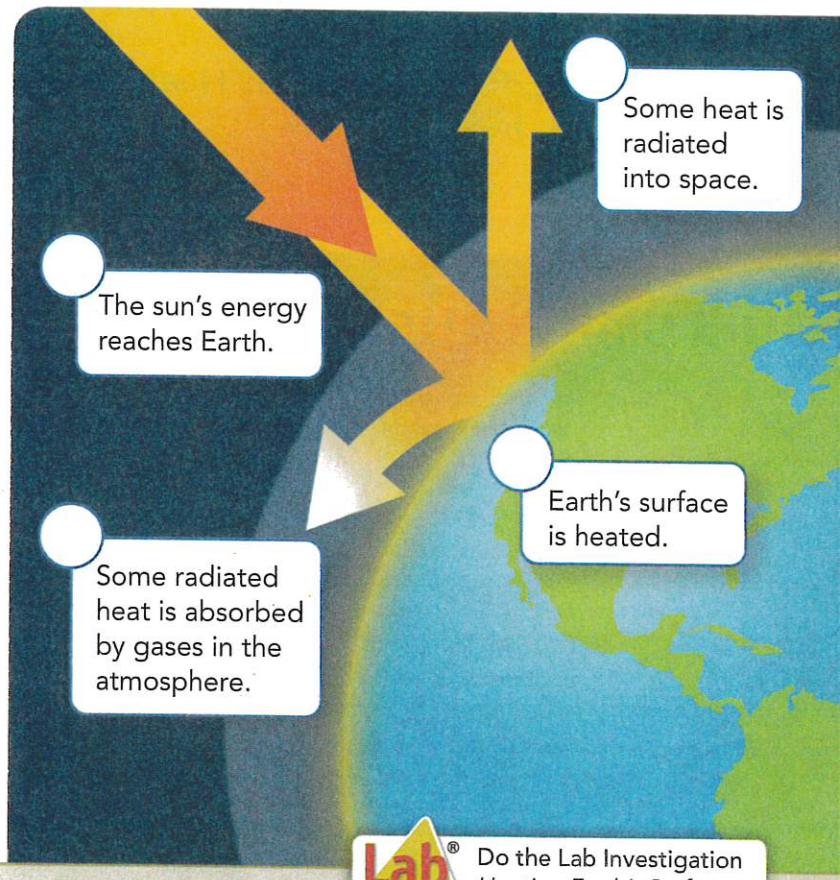
The greenhouse effect, shown in **Figure 4,** is a natural process. It keeps Earth's atmosphere at a temperature that is comfortable for most living things. Over time, the amount of energy absorbed by the atmosphere and Earth's surface is in balance with the amount of energy radiated into space. In this way, Earth's average temperatures remain fairly constant. But scientists have evidence that human activities may be altering this process.

FIGURE 4

ART IN MOTION **Greenhouse Effect**

The greenhouse effect is a natural heat-trapping process.

Sequence **Number each step in the diagram to show how the greenhouse effect takes place. Discuss the diagram with a partner.**



Lab zone® Do the Lab Investigation *Heating Earth's Surface.*

Assess Your Understanding

1a. Summarize What happens to most of the sunlight that reaches Earth?

GLE 27

b. Interpret Diagrams In **Figure 3,** what percentage of incoming sunlight is reflected by clouds, dust, and gases in the atmosphere?

GLE 27

c. Predict How might conditions on Earth be different without the greenhouse effect?

GLE 27

got it?

○ I get it! Now I know some energy _____

○ I need extra help with _____

Go to **my science coach** *online for help with this subject.*

GLE 27

Louisiana

LESSON 6

Winds

UNLOCK THE BIG ?

- What Causes Winds?
  GLE 27 (ESS-M-A12)
- How Do Local Winds and Global Winds Differ?
  GLE 27 (ESS-M-A12); 43, 44 (ESS-M-C6)

MY PLANET DIARY

EXTREME SPORTS

Windsurfing

Imagine being able to ride a wave at almost 81 km/h—not in a boat powered by a motor but on a board powered only by the wind. That's what windsurfing is all about.

Windsurfers stand on a sailboard, which is similar to a surfboard. But the sailboard has a mast and a sail that the surfer can control with his or her hands. It uses a sail to capture wind and move the surfer along the surface of the water. Jim Drake, one of the first inventors of windsurfing, points out:

> *"It's the simplicity of standing up so you can adjust your weight and move quickly, as well as actively participate in transmitting the sail's forces to the board."*

Discuss these questions with a classmate. Write your answers below.

1. How does wind move the sail?

2. How have you experienced the effects of wind?

PLANET DIARY Go to **Planet Diary** to learn more about winds.

Lab zone® Do the Inquiry Warm-Up *Does the Wind Turn?*

Vocabulary

- wind
- anemometer
- windchill factor
- local winds
- sea breeze
- land breeze
- global winds
- Coriolis effect
- latitude

Skills

- Reading: Identify Supporting Evidence
- Inquiry: Draw Conclusions

What Causes Winds?

Grade 8 Grade Level Expectation

GLE 27 Identify different air masses, jet streams, global wind patterns, and other atmospheric phenomena and describe how they relate to weather events, such as El Niño and La Niña. (ESS-M-A12)

Air is a fluid, so it can move easily from place to place. But how does it do that? **Differences in air pressure cause the air to move.** **Wind** is the movement of air parallel to Earth's surface. Winds move from areas of high pressure to areas of lower pressure.

Most differences in air pressure are caused by the unequal heating of the atmosphere. Recall that convection currents form when an area of Earth's surface is heated by the sun's rays. Air over the heated surface expands and becomes less dense. As the air becomes less dense, its air pressure decreases. If a nearby area is not heated as much, the air above the less-heated area will be cooler and denser. The cool, dense air with a higher pressure flows underneath the warm, less dense air. This forces the warm air to rise.

FIGURE 1

Moving Air

Windsurfers need wind in order to move across the water. **Explain** **How do differences in air pressure cause wind?**

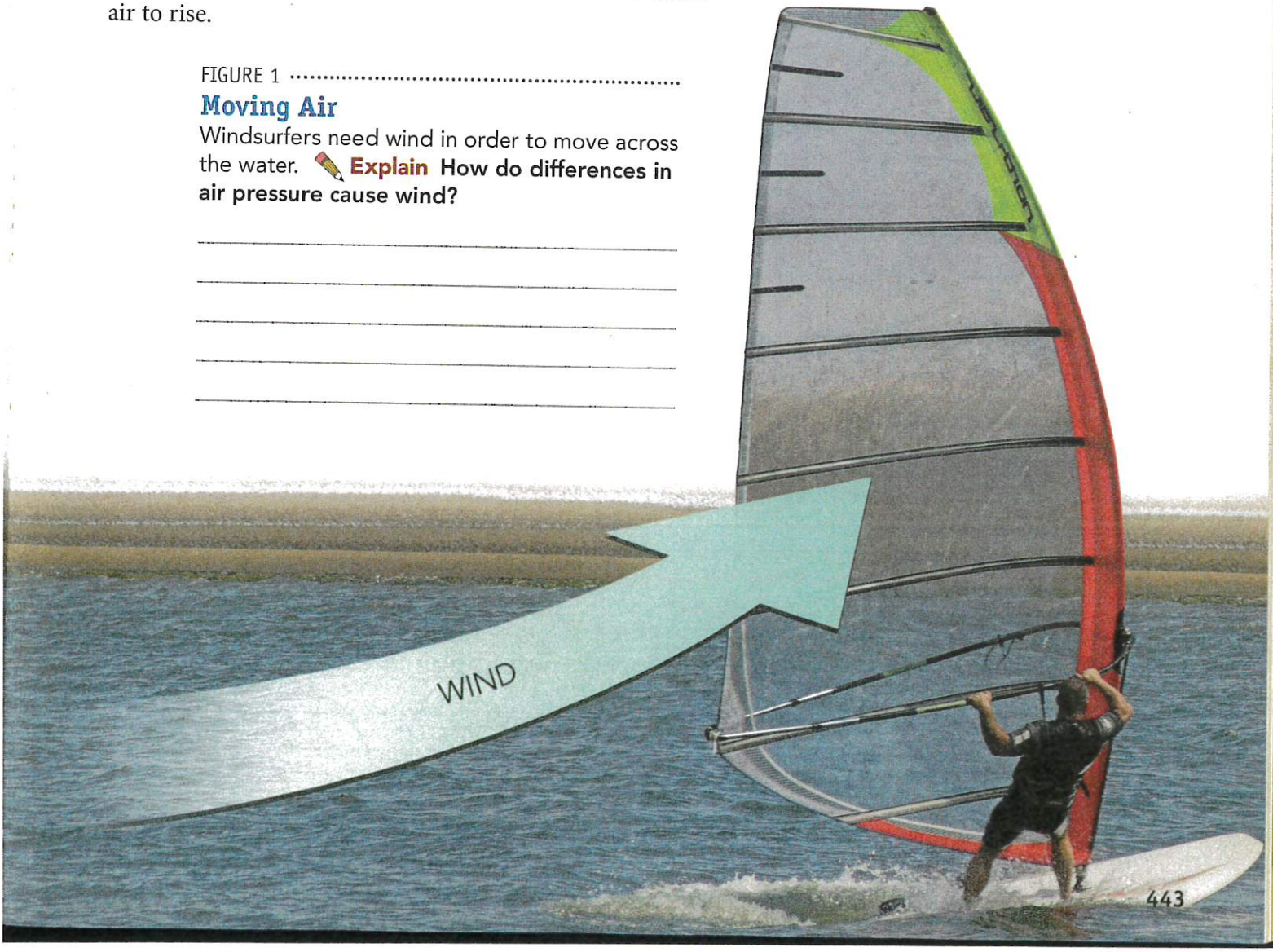
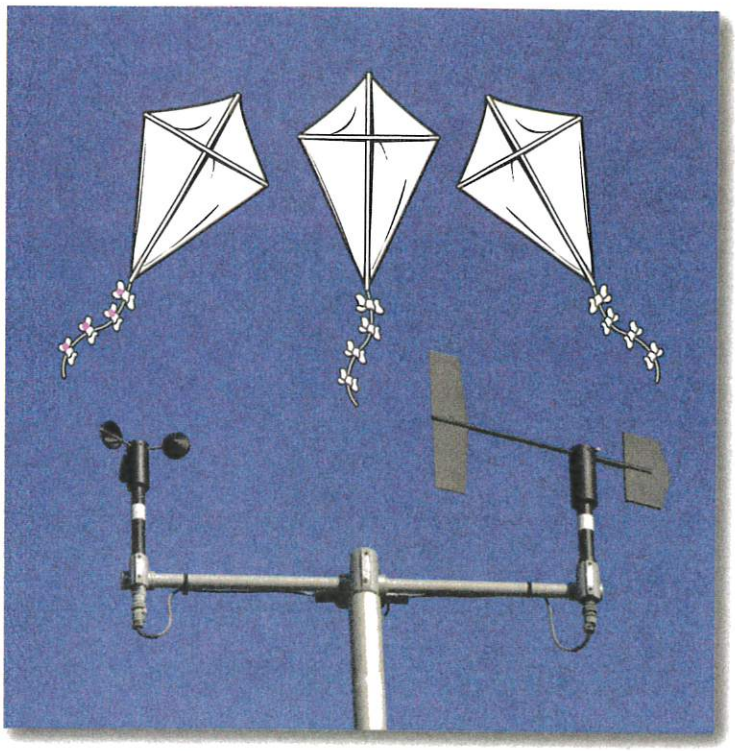


FIGURE 2

Wind Direction and Speed

Identify Based on the direction of the wind vane, which direction would your kite be flying? Indicate your answer by shading in your kite.



Measuring Wind

Winds are described by their direction and speed. Winds can blow from all directions: north, south, east, and west. Wind direction is determined with a wind vane. The wind swings the wind vane so that one end points into the wind. The name of a wind tells you where the wind is coming from. For example, a south wind blows from the south toward the north. A north wind blows to the south.

Wind speed can be measured with an **anemometer** (an uh MAHM uh tur). An anemometer has three or four cups mounted at the ends of spokes that spin on an axle. The force of the wind against the cups turns the axle. A meter connected to the axle shows the wind speed. **Figure 2** shows a wind vane and an anemometer.

Windchill Factor

On a warm day, a cool breeze can be refreshing. But during the winter, the same breeze can make you feel uncomfortably cold. The wind blowing over your skin removes body heat. The stronger the wind, the colder you feel. The increased cooling that a wind can cause is called the **windchill factor.** A weather report may say, "The temperature outside is 20 degrees Fahrenheit. But with a wind speed of 30 miles per hour, the windchill factor makes it feel like 1 degree above zero."

Lab zone® Do the Quick Lab *Build a Wind Vane.*

Assess Your Understanding

1a. Define What is wind?

GLE 27

b. Relate Cause and Effect How is wind related to air pressure and temperature?

GLE 27

got it?

○ I get it! Now I know that wind is _____

○ I need extra help with _____

Go to my science coach *online for help with this subject.*

GLE 27

How Do Local Winds and Global Winds Differ?

Have you ever noticed a breeze at the beach on a hot summer day? Even if there is no wind inland, there may be a cool breeze blowing in from the water. This breeze is an example of a local wind.

Local Winds Winds that blow over short distances are called **local winds.** **The unequal heating of Earth's surface within a small area causes local winds.** These winds form only when large-scale winds are weak. Two types of local winds are sea breezes and land breezes, as shown in **Figure 3.**

Grade 8 Grade Level Expectations

GLE 27 Identify different air masses, jet streams, global wind patterns, and other atmospheric phenomena and describe how they relate to weather events, such as El Niño and La Niña. (ESS-M-A12)

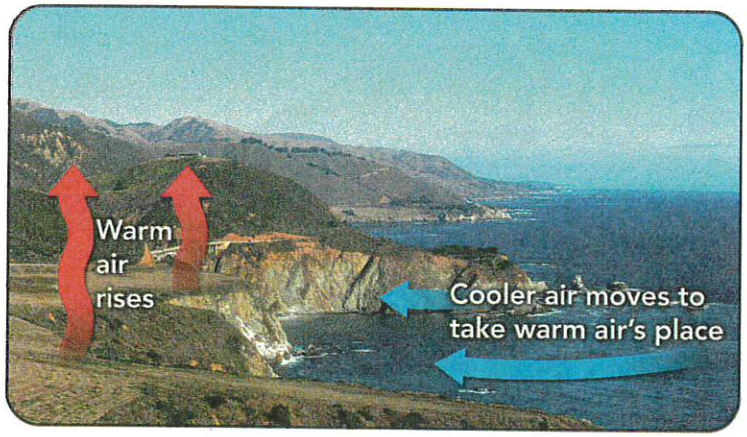
GLE 43 Identify the processes involved in the creation of land and sea breezes. (ESS-M-C6)

GLE 44 Describe how unequal heating of Earth's surface affects movement of air masses and water in the atmosphere and hydrosphere. (ESS-M-C6)

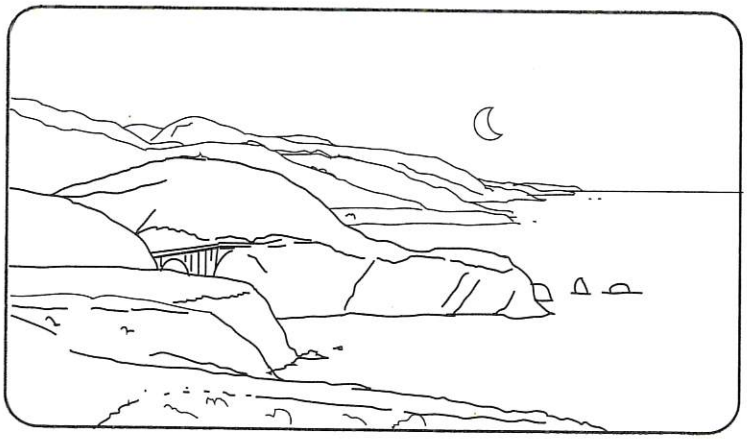
FIGURE 3

Local Winds

Relate Text and Visuals Read about sea breezes. Add arrows to the bottom diagram to indicate how a land breeze develops. Then summarize the process.



Sea Breeze During the day, the land warms up faster than the water. The air over the land gets warmer than the air over the water. This warm air is less dense. It expands and rises, creating a low-pressure area. Cool air blows inland from over the water and moves underneath the warm air, causing a sea breeze. A **sea breeze** or a lake breeze is a local wind that blows from an ocean or lake.



Land Breeze At night, the process is reversed. The flow of air from land to a body of water forms a **land breeze.**

Global Winds

Global winds are winds that blow steadily from specific directions over long distances. **Like local winds, global winds are created by the unequal heating of Earth's surface. But unlike local winds, global winds occur over a large area.** In **Figure 4,** you can see how the sun's radiation strikes Earth. In the middle of the day near the equator, the sun is almost directly overhead. The direct rays from the sun heat Earth's surface intensely. Near the poles, the sun's rays strike Earth's surface at a lower angle. The sun's energy is spread out over a larger area, so it heats the surface less. As a result, temperatures near the poles are much lower than they are near the equator.

Global Convection Currents

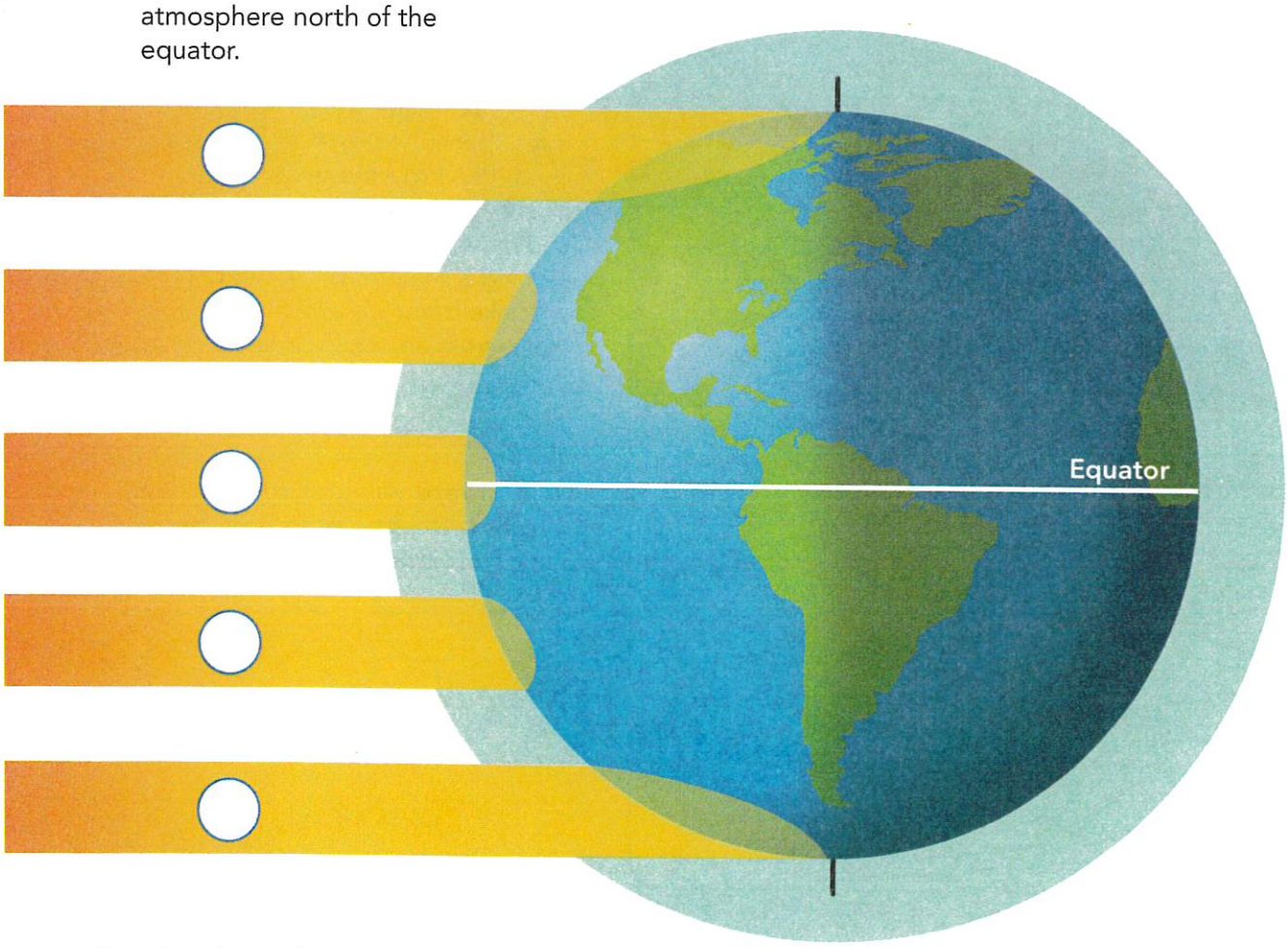
How do global winds develop? Temperature differences between the equator and the poles produce giant convection currents in the atmosphere. Warm air rises at the equator, and cold air sinks at the poles. Therefore air pressure tends to be lower near the equator and greater near the poles. This difference in pressure causes winds at Earth's surface to blow from the poles toward the equator. Higher in the atmosphere, however, air flows away from the equator toward the poles. Those air movements produce global winds.

FIGURE 4

Heating of Earth's Surface

Interpret Diagrams **The angle of the sun's rays causes temperature differences at Earth's surface.**

1. Label the areas where the sun hits Earth most directly (M) and least directly (L).
2. CHALLENGE Draw a convection current in the atmosphere north of the equator.



The Coriolis Effect If Earth did not rotate, global winds would blow in a straight line from the poles toward the equator. Because Earth is rotating, however, global winds do not follow a straight path. As the winds blow, Earth rotates from west to east underneath them, making it seem as if the winds have curved. The way Earth's rotation makes winds curve is called the **Coriolis effect** (kawr ee OH lis). Because of the Coriolis effect, global winds in the Northern Hemisphere gradually turn toward the right. A wind blowing toward the south gradually turns toward the southwest. In the Southern Hemisphere, winds curve toward the left.

Identify Supporting Evidence Underline the text that describes how winds blow due to the Coriolis effect.

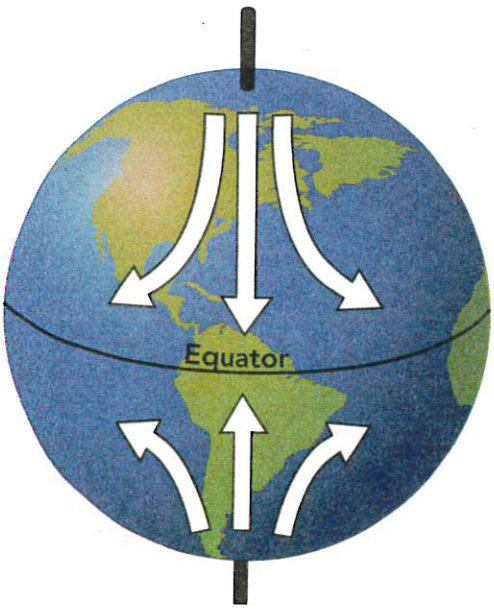
apply it!

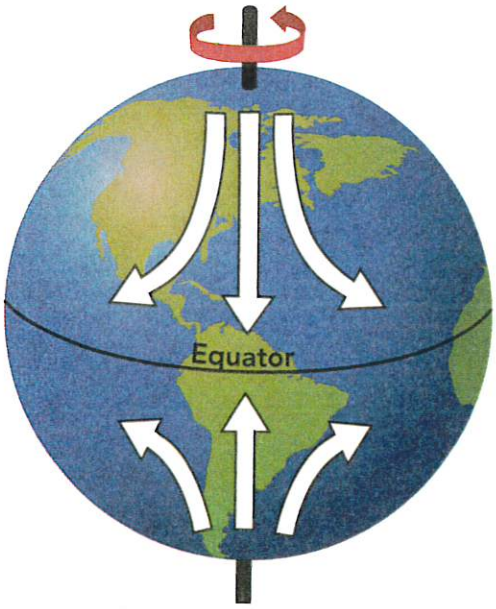
The Coriolis effect determines the direction of global winds.

1. Look at the globe on the left. Shade in the arrows that show the direction the global winds would blow without the Coriolis effect.

2. Look at the globe on the right. Shade in the arrows that show the direction the global winds blow as a result of the Coriolis effect.

3. **Draw Conclusions** Based on your last answer, what direction do global winds blow in the Northern Hemisphere? In the Southern Hemisphere?





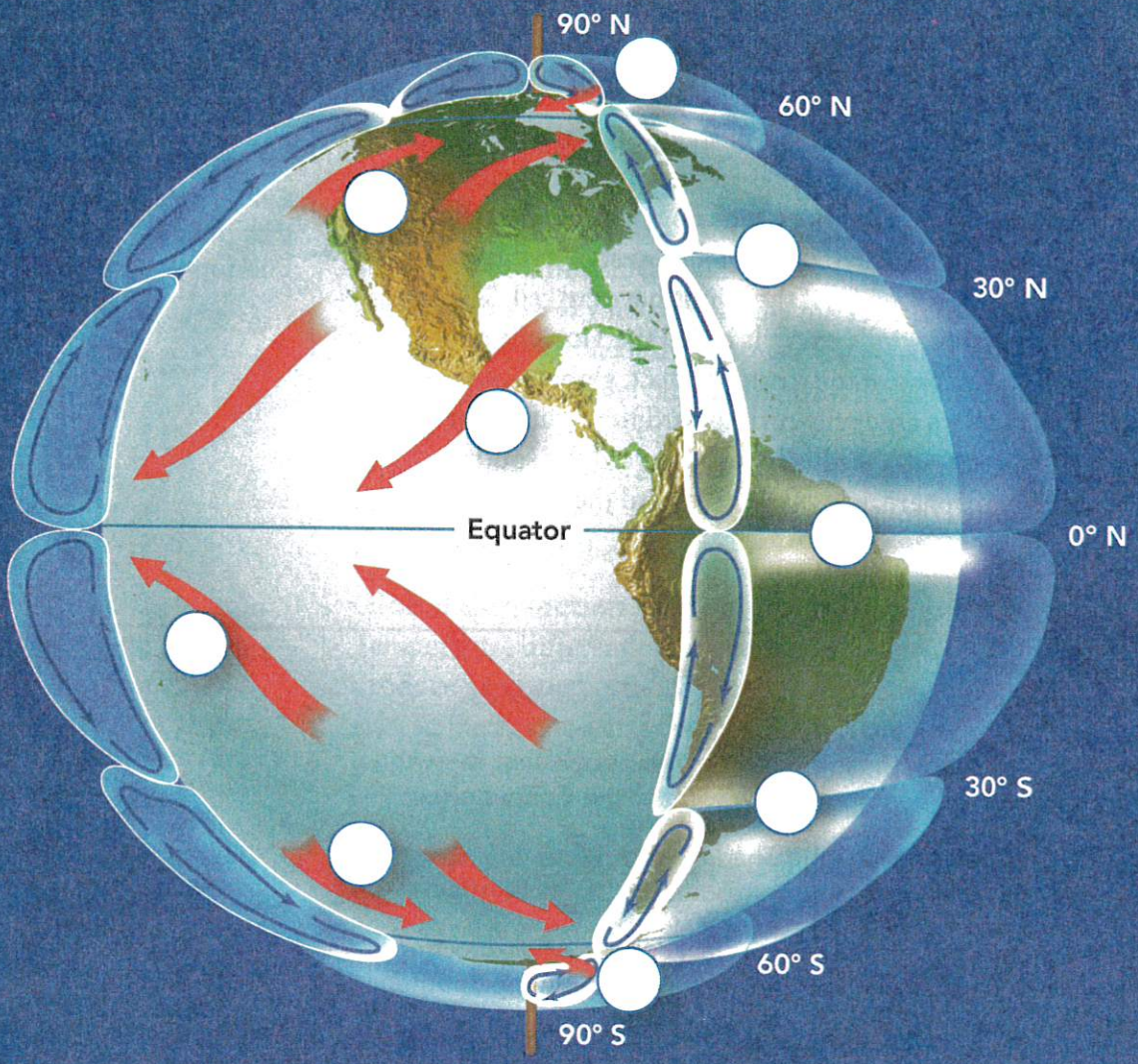


FIGURE 5

INTERACTIVE ART

Global Wind Belts

The Coriolis effect and other factors combine to produce a pattern of wind belts and calm areas around Earth.

Relate Text and Visuals

Match the descriptions of the global winds with their location on the globe.

A **Doldrums** are a calm area where warm air rises. They occur at the equator where the sun heats the surface strongly. Warm air rises steadily, creating an area of low pressure. Cool air moves into the area, but is warmed rapidly and rises before it moves very far.

B **Horse Latitudes** are two calm areas of sinking air. **Latitude** is the distance from the equator, measured in degrees. At about 30° north and south latitudes, the air stops moving toward the poles and sinks.

C **Trade Winds** blow from the horse latitudes toward the equator. As cold air over the horse latitudes sinks, it forms a region of high pressure. This causes surface winds to blow. The winds that blow toward the equator are turned west by the Coriolis effect.

D **Prevailing Westerlies** blow from west to east, away from the horse latitudes. In the mid-latitudes, between 30° and 60° north and south, winds that blow toward the poles are turned toward the east by the Coriolis effect.

E **Polar Easterlies** blow cold air away from the poles. Air near the poles sinks and flows back toward lower latitudes. The Coriolis effect shifts these polar winds to the west, producing the polar easterlies.

ASSIGNMENTS

Day 6 Assignment

Name: _____

KEY IDEAS

- The sun drives all weather patterns on Earth
- Energy from the sun is transferred to water and land at different rates.
- Water heats and cools at a slower rate than the land, as water absorbs and stores large amounts of energy from the sun and release it very slowly
    - This causes patterns in climates as land near the ocean experiences more mild temperatures than land further from the ocean.
- Sunlight energy propels oceanic and atmospheric circulation
    - Ocean currents are created by changes in temperature and salinity.
    - As water heats, it becomes less dense, and rises. This causes cooler, more dense water to sink.
    - Water that has a greater salinity, or salt content, is more dense and also sinks.
    - As warm currents pass a land mass, that region experiences warmer temperatures, the opposite is true for cooler currents

Define the Following Terms:

Current:

_____

_____

Coriolis Effect:

_____

_____

Questions to Answer

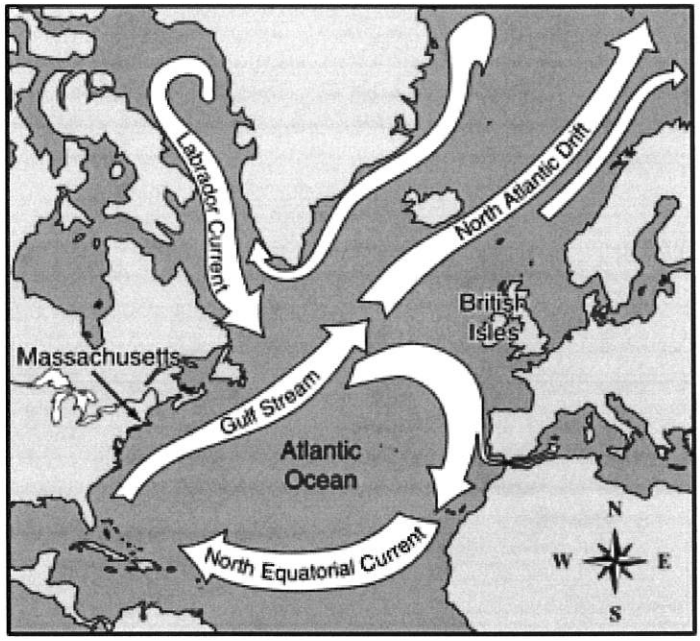
1. How are surface currents and deep ocean currents different? Explain what causes each in your answer.

2. How do ocean currents affect climate? Explain the role of the global ocean conveyor in your answer.

3. Why do Coastal regions have different climates than

EXIT TICKET

The map below shows Atlantic Ocean currents.



1. Which of the currents *most* affects the climate of Massachusetts and its surrounding states?

- **A.** Gulf Stream
- **B.** Labrador Current
- **C.** North Atlantic Drift
- **D.** North Equatorial Current

The table below shows the average summer temperature increases for regions in Canada.

Average Summer Temperature for Regions in Canada (1948–2004)

Region in Canada	Temperature Increase (°C)
Atlantic coast	0.46
Pacific coast	0.67
northeastern forest	0.29
northwestern forest	0.57
southern mountains	0.71
northern mountains	0.86

Part A

2. Which trend can be correctly inferred from the data?

- **A.** The mountain regions are warming more than the coasts.
- **B.** The forest regions are warming more than the mountain regions.
- **C.** The Atlantic coast is warming more than the Pacific coast.
- **D.** The northeastern forest is warming more than the northwestern forest.

Part B

3. Explain why the trend identified in Part A is observed.

Name: _____

KEY IDEAS

- The sun's energy heats Earth's surface, which in turn heats the atmosphere (the air above it)
- The atmosphere is made of particles and gas
- As solar radiation, or light energy hits the surface of the Earth, some of it is reflected back into space, but some of it reaches Earth's surface and transfers to heat energy.
- Greenhouse gasses slow down the release of this heat energy from the surface of Earth as they trap the heat energy in the atmosphere.
    - The greenhouse gases (Ch_4, CO_2, H_2O (vapor), and N_2O)
    - Without greenhouse gasses, earth would be too cold for life. If Earth has too much greenhouse gasses, it would be too hot.

Define the Following Terms:

Atmosphere:

_____

_____

Greenhouse Effect:

_____

_____

Greenhouse Gases:

_____

_____

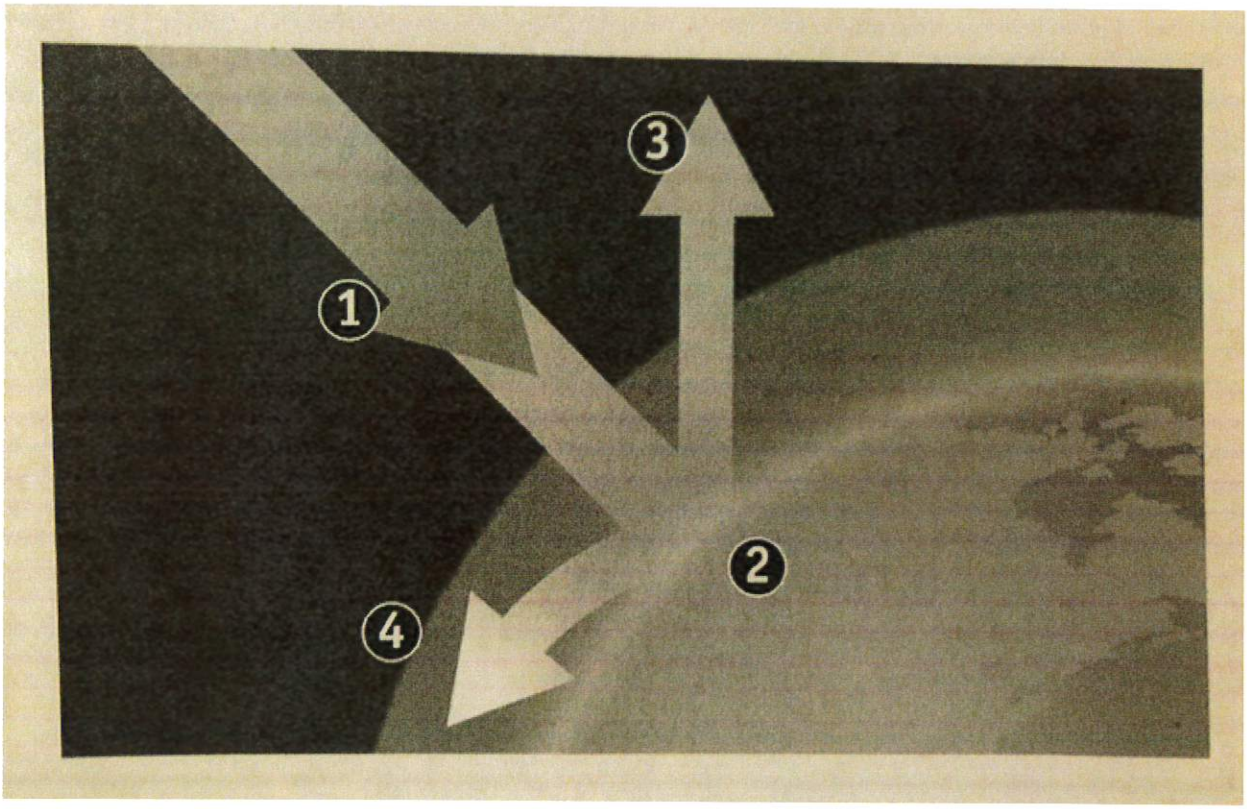
Questions to Answer:

1. What components make up the atmosphere?

2. What happens to most of the sunlight that reaches Earth?

3. How does most of the energy from the sun travel to Earth's surface?

Use the diagram to answer question 4



4. Describe the process that results in the greenhouse effect. How does it affect Earth's atmosphere?

EXIT TICKET

1. Which gases are common greenhouse gases?

Select the **three** best answers

- **A.** Carbon Dioxide (CO_2) gas
- **B.** Helium (He_2) gas
- **C.** Methane (CH_4) gas
- **D.** Nitrogen (N_2) gas
- **E.** Oxygen (O_2) gas
- **F.** Water Vapor (H_2O)

2. How would earth be different without greenhouse gases? Explain your answer by explaining the relationship between the atmosphere and the sun's energy.

Name: _____

KEY IDEAS

- The sun heats the Earth unequally
- - Warmer air is less dense and rises creating less pressure
- -Cooler air is more dense and falls, creating more pressure.
- -Denser air with more pressure moves towards areas of lower pressure.
- -The wind can move clouds throughout the atmosphere, bringing precipitation to a new location.

Define the Following Terms:

Coriolis Effect: _____

_____

Local Winds:

_____

_____

Global Winds:

_____

_____

Wind: _____

_____

Questions to Answer:

1. How do differences in air pressure cause wind?

2. How does the movement of hot air at the equator and cold air at the poles produce global wind patterns?

3. Which causes land and sea breezes?

- **A.** Temperature difference between the equator and the poles?
- **B.** The unequal heating of Earth's surface
- **C.** Equal areas of pressure
- **D.** The increased windchill factor on a cold day

Use the diagram to answer question 4

Barometric Pressure (millibars)

City	Friday	Saturday	Sunday
Baton Rouge, Louisiana	1005	1011	1006
Houston, Texas	1006	1008	1002

4. The data table shows the barometric air pressure readings for two cities. In which direction would you expect winds to move on each day? Explain your answer.

EXIT TICKET

1. The main source of energy for wind currents on Earth is

- **A.** Lightning
- **B.** Heat from the Sun
- **C.** The moon's gravity
- **D.** Heat from Earth's interior

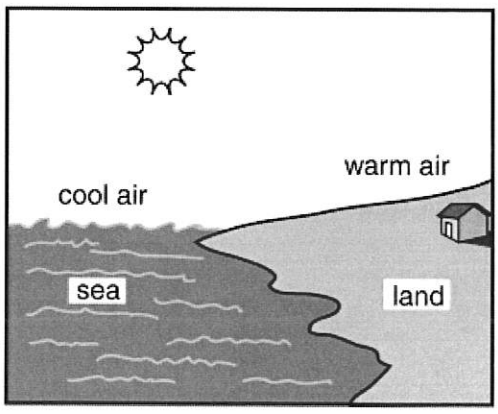
2. Which best explains how the Coriolis effect influences weather conditions?

- **A.** It causes winds to rotate, forming tornadoes on Earth
- **B.** It causes winds to move from East to West (left to right) in the Southern Hemisphere
- **C.** It causes winds to move from East to West (left to right)
- **D.** It causes winds to follow a straight-line path around Earth

3. Air moving from the poles toward the equator turns west. The primary cause of this global deflection is

- **A.** The shape and size of land masses
- **B.** Larger cities surrounded by farmlands
- **C.** Changes in the magnetic field
- **D.** The rotation of the planet

The picture below shows a place where air currents will form due to the uneven heating of Earth.



4. In which direction will air currents *most likely* move?

- **A.** Straight down over the land
- **B.** From the land toward the sea
- **C.** Straight up above the sea
- **D.** From the sea toward the land