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This Skills Workbook contains worksheets that accompany the lessons from the Teacher Guide for Unit 5. Each worksheet is identified by its lesson number and where it is intended to be used. For example, if there are two worksheets for Lesson 8, the first will be numbered 8.1 and the second 8.2. The Skills Workbook is a student component, which means each student should have a Skills Workbook.
<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is it?</td>
</tr>
<tr>
<td>How do we get it?</td>
</tr>
<tr>
<td>What is the source?</td>
</tr>
<tr>
<td>How fast does it travel?</td>
</tr>
<tr>
<td>How does it travel?</td>
</tr>
<tr>
<td>What kind of object?</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>What happens when it hits...?</td>
</tr>
<tr>
<td>What kinds are there?</td>
</tr>
</tbody>
</table>
Dear Family Member,

Please help your child succeed in spelling by taking a few minutes each evening to review the words together. Helpful activities for your child to do include: spelling the words orally, writing sentences using the words, or simply copying the words.

**Spelling Words**

This week, we are reviewing all eight spelling patterns for the sound /ée/ that we have already learned. On Friday, your child will be tested on these words.

Students have been assigned two Challenge Words, *almost* and *really*. Challenge Words are words used very often. While *almost* does not follow the spelling pattern of /ée/, *really* does as the ‘ea’ and the ‘y’ in *really* are both pronounced /ée/.

The Content Word for this week is *electricity*. This word is directly related to the material that we are reading in *Adventures in Light and Sound*. The Content Word is an optional spelling word for your child. If your child would like to try it but gets it incorrect, it will not count against him or her on the test. We encourage everyone to stretch themselves a bit and try to spell this word.
The spelling words, including the Challenge Words and the Content Word, are listed below:

<table>
<thead>
<tr>
<th>1 succeeded</th>
<th>12. stadium</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. money</td>
<td>13. chariot</td>
</tr>
<tr>
<td>3. enemy</td>
<td>14. degree</td>
</tr>
<tr>
<td>4. centipede</td>
<td>15. athlete</td>
</tr>
<tr>
<td>5. experience</td>
<td>16. chief</td>
</tr>
<tr>
<td>6. believe</td>
<td>17. grease</td>
</tr>
<tr>
<td>7. secret</td>
<td>18. scenic</td>
</tr>
<tr>
<td>8. increase</td>
<td>19. <strong>Challenge Word</strong>: almost</td>
</tr>
<tr>
<td>9. chimney</td>
<td>20. <strong>Challenge Word</strong>: really</td>
</tr>
<tr>
<td>10. tedious</td>
<td><strong>Content Word</strong>: electricity</td>
</tr>
<tr>
<td>11. fancy</td>
<td></td>
</tr>
</tbody>
</table>

**Student Reader**

The chapters your child will read this week in *Adventures in Light and Sound* include information about what light is, how shadows are made, and mirrors and reflections. Be sure to ask your child each evening about what he or she is learning.

Students will take home text copies of the chapters in the Reader throughout the unit. Encouraging students to read a text directly related to this domain-based unit will provide content and vocabulary reinforcement. Your child will also bring home a copy of the glossary for use in reading the text copies to family members. The bolded words on the text copies are the words found in the glossary.
What Is Light?

1. How fast does light travel?
   A. 106,000 miles a second in a vacuum
   B. 156,000 miles a second in a vacuum
   C. 186,000 miles a second in a vacuum
   D. 126,000 miles a second in a vacuum

2. How does all light travel?
   A. All light travels in the form of sources.
   B. All light travels in the form of waves.
   C. All light travels in the form of groups.
   D. All light travels in the form of gases.

3. What determines whether you can see light waves or not?
   A. the speed of the source
   B. the length of the source
   C. the speed of the wave
   D. the length of the wave
4. What is the meaning of the word **reflect** in this sentence from the selection:

   The moon does, however, **reflect** light from the sun.

   A. send back  
   B. make  
   C. absorb  
   D. create

5. Describe white light.

   ____________________________________________
   ____________________________________________
   ____________________________________________

   Page _____


   ____________________________________________
   ____________________________________________
   ____________________________________________

   Page _____

7. What is the main idea of this chapter?

   ____________________________________________
   ____________________________________________
Making Adverbs With the Suffix –ly

• Draw a wiggly line under the verb.
• Then, change the adjective under the blank to an adverb by adding –ly to complete the sentence.
• Draw a triangle around the adverb and an arrow from the adverb to the verb. Then, answer the question after the sentence.

1. We waited ________________ for our turn to look through the telescope.
   How did we wait? _______________________

2. People were riding in the car ________________ because they weren’t wearing their seatbelts.
   How were the people riding? _______________________

3. Our teacher drew lines ________________ on the paper so we would know where to write each separate part.
   How did our teacher draw lines? _______________________

4. I ________________ arranged my books on the shelves when I cleaned my room.
   How did I arrange my books? _______________________


5. A woman at a table near us in the restaurant __________________ Completely asked the waiter for more water.

   How did the woman ask? ________________________________

6. The new medicine the doctor gave me went down ________________ when I swallowed it compared to what I took last year when I was sick.

   How did the medicine go down? ________________________________

Write a sentence using each adverb. Remember, the adverb should describe the verb.

1. **slowly**

   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

2. **loudly**

   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
What Is Light?

Did you know that the sun is the greatest source of light for our planet, Earth? But what is light? Why is it so important?

Hot gases of the sun give off both light and heat energy. Light carries energy, with the long wavelengths carrying the least and the short wavelengths carrying the most. When you think of something with lots of energy, what comes to mind?

Do you think of something fast like a race car? Do you think of something with great force like a very strong wind knocking down a tree?

Believe it or not, light can be many times more energetic than a car or the wind.

Light travels at 186,000 miles every second in a vacuum. At that speed, light can go around Earth more than seven times every second! No human-made machine can go that fast—not even a jet plane or rocket!

One way that light travels, including light from the sun, is in the form of waves. Scientists can measure how long light waves are. Waves can be different sizes—some are long and some are short. Some light waves are visible and some are invisible. Whether you can see light or not depends on the length of the wave. The longest wavelength of visible light is seen as red and the shortest wavelength is violet. Short wavelengths carry the most energy.

The sun gives off what is called white light. Perhaps you think of the light from the sun as having no color at all. Maybe you think the light from the sun is more yellow in color. It may surprise you to know that the sun’s light, white light, is made up of all the colors of the rainbow. White light includes light of different wavelengths, including all the colors we can see.
Of all the wavelengths in the sun’s light, there is just a little more of the yellow wavelengths than the other colors. This is why the sun looks yellow when we see it against the blue sky. Still, the light from the sun includes all of the other colors and wavelengths. You will learn more about white light, visible light, and colors in a later chapter in this Reader.

Although the sun is the greatest source of visible light, there are also other sources of light. What else in the sky provides light? The other stars in the night sky provide light, though it is not as bright as the light from the sun during the day. The moon is not a star and does not give off its own light.

Can you think of other sources of light? Is there light in your classroom right now? Perhaps it is from the sun shining through the windows. Chances are good, though, that some of the light in the room may be coming from light bulbs. Like the sun, most light bulbs give off white light. Electric lights are such a part of our everyday life, we don’t even think about them—unless the electricity goes off! This doesn’t happen often, but sometimes it does during a bad storm. When the electricity goes off and we do not have light from light bulbs, people sometimes use other sources of light, like flashlights or candles.

Light is important for many reasons. Light and heat energy from the sun warms Earth. Without the light and heat energy from the sun, Earth would be freezing cold. You also learned back in kindergarten that the sun’s light is needed for plants to grow. Also, without light, there would be no colors. Can you think of another reason that light is important?

Try to imagine a world in which there is no light—no sun, no stars, no candles, and no light bulbs. What would be different? If you just said that it would be dark, you are only partly right. What else would change? Without light, you would not be able to see anything! A world without light is almost impossible to imagine.
Make Adverbs With the Suffix –ly

- Draw a wiggly line under the verb.
- Then, change the adjective under the blank to an adverb by adding –ly to complete the sentence.
- Draw a triangle around the adverb and an arrow from the adverb to the verb. Then, answer the question after the sentence.

Example:

Tom answered _____ that he did not know how the vase got broken.

Tom answered how? ______

1. The man on the subway ______ offered his seat to the older woman.

How did the man offer his seat? ______

2. The little boy walked ______ down the stairs.

How did the little boy walk? ______

3. The mayor ______ announced that he would retire.

How did the mayor announce he would retire? ______
4. Our teacher _______________ explained what we were to do for homework.  
   (clear)  
   How did our teacher explain the homework? _______________  

5. My sister _______________ dropped her jacket on the floor.  
   (careless)  
   How did my sister drop her jacket? _______________  

Write a sentence using each adverb. Remember, the adverb should describe the verb.  

1. softly  
   ____________________________  
   ____________________________  
   ____________________________  
   ____________________________  

2. tightly  
   ____________________________  
   ____________________________  
   ____________________________  
   ____________________________
How Are Shadows Made?

Label each of the following objects as either transparent or opaque.

1. desk
2. fish tank
3. human body
4. plastic wrap
5. car window

Write an X on the line to show where an object should be placed to make a big shadow.

6. Light source __________ __________ __________ = Big shadow

Write an X on the line to show where an object should be placed to make a small shadow.

7. Light source __________ __________ __________ = Small shadow
What kind of shadow will you see? Circle the answer.

8. Light source ________ ________ ________ = Big or small shadow
   Light source ________ ________ ________ = Big or small shadow

9. Why did the author most likely write this selection?
   A. to tell readers about candles
   B. to tell readers about skylights
   C. to tell readers about shadows
   D. to tell readers about lights
### Suffixes: –er, –or, –ist, and –ian

This chart lists words with some of the suffixes studied in Grade 3. Some of these words are new to you. Use the chart to fill out Worksheet 3.3.

<table>
<thead>
<tr>
<th></th>
<th>–er</th>
<th>–or</th>
<th>–ist</th>
<th>–ian</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>actor</td>
<td>artist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>counselor</td>
<td>cartoonist</td>
<td>comedian</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>dancer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>editor</td>
<td></td>
<td>electrician</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td>farmer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g</td>
<td>governor</td>
<td>guitarist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>hunter</td>
<td></td>
<td>historian</td>
<td></td>
</tr>
<tr>
<td>i</td>
<td>inspector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>l</td>
<td></td>
<td></td>
<td>librarian</td>
<td></td>
</tr>
<tr>
<td>m</td>
<td></td>
<td></td>
<td>mathematician</td>
<td></td>
</tr>
<tr>
<td>n</td>
<td></td>
<td></td>
<td>novelist</td>
<td></td>
</tr>
<tr>
<td>o</td>
<td></td>
<td></td>
<td>organist</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>player</td>
<td></td>
<td>pediatrician</td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>reporter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>s</td>
<td>singer</td>
<td>sailor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t</td>
<td>teacher</td>
<td></td>
<td>tourist</td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>visitor</td>
<td>violinist</td>
<td>vegetarian</td>
<td></td>
</tr>
<tr>
<td>z</td>
<td></td>
<td>zoologist</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Suffixes: –er, –or, –ist, and –ian

Answer the following questions using the words on Worksheet 3.2.

1. Which word on the chart names a doctor who specializes in taking care of babies and children?
   __________________

2. Which word on the chart names someone who can help you find good books to read at the library?
   __________________

3. You might be one of these if you like to play on sports teams. ____________

4. If you don’t eat any meat, you are a ________________.

5. If you like to tell jokes and make people laugh, you are a ________________.

6. If you have done extensive research on ancient Rome, you are probably a ________________.

7. If your job is to study animals and their habitats, you are probably a ________________.

8. List the words that name people who play musical instruments.
   ________________  ________________  ________________

9. If you like to draw, you could be either one of these. ________________
   ________________
10. If you want to be a person who makes or writes fictional books, you want to be a ________________.

11. If you go to a new city to explore for a few days, you may be either one of these. ________________  ________________

12. If you understand how to put wires for electricity in a new house, you might be an ________________.
Use Adjectives and Adverbs Correctly

Fill in the blank with an adjective or an adverb, depending on whether a noun or verb is described.

<table>
<thead>
<tr>
<th>loud</th>
<th>careful</th>
<th>tight</th>
<th>slow</th>
<th>glad</th>
<th>silent</th>
</tr>
</thead>
<tbody>
<tr>
<td>loudly</td>
<td>carefully</td>
<td>tightly</td>
<td>slowly</td>
<td>gladly</td>
<td>silently</td>
</tr>
</tbody>
</table>

1. The turtle walked _____________ across the sidewalk towards the pond.
2. The _____________ belt pinched my waist.
3. The _____________ sound hurt my ears.
4. Our teacher asked us to read _____________ instead of with a partner.
5. The father _____________ buckled his seat belt.
6. She _____________ put the baby down in his crib so she would not wake him up.
7. My brother _____________ fastened his shoelaces so he would not trip.
8. People cheered _____________ as the soccer team scored a goal to break the tie.

Bonus: Mark the adjectives with a box and the adverbs with a triangle, and then draw an arrow to the word they describe.
Blank Busters

<table>
<thead>
<tr>
<th>succeeded</th>
<th>money</th>
<th>enemy</th>
<th>centipede</th>
</tr>
</thead>
<tbody>
<tr>
<td>experience</td>
<td>believe</td>
<td>secret</td>
<td>increase</td>
</tr>
<tr>
<td>chimney</td>
<td>tedious</td>
<td>fancy</td>
<td>degree</td>
</tr>
<tr>
<td>athlete</td>
<td>chief</td>
<td>grease</td>
<td>scenic</td>
</tr>
<tr>
<td>chariot</td>
<td>stadium</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Challenge Word:** almost

**Challenge Word:** really

**Content Word:** electricity

Fill in the blanks in the sentences below with one of the spelling words in the chart. Only if needed, add a suffix to the end of a word in order for the sentence to make sense: –s, –ed, –ing or –ly.

1. The hiker trudged along _______________ up the mountain.

2. She enjoyed watching the sprinters and other talented ________________ race around the enormous ________________.

3. It seemed that the _______________ on the rooftop was ________________ as tall as a skyscraper.

4. The _______________ overlook on the mountain road was breathtaking!

5. Can you ________________ that the amount of homework will be ________________ in January?

6. It was a _______________ that the many legged ________________ in the story had pockets full of ________________.
7. The ________________ of police has a ________________ office with a beautiful view of the city.

8. The fire on the stove was caused by ________________ that spilled from the pan.

9. You have ________________ in making me laugh for hours!

10. Do you understand how ________________ works to make an oven heat up?

Write three sentences using spelling words of your choice that were not used in the first ten sentences. Make sure to use correct capitalization and punctuation. You may use the Challenge Words or the Content Word in your sentences.

1. _____________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________

2. _____________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________

3. _____________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________
How Are Shadows Made?

Read the examples below carefully. If the light source causes a shadow, write “shadow” on the blank. If the light source does not cause a shadow, write “no shadow” on the blank.

1. The sunlight is streaming through a window hitting a rocking chair. ____________________________

2. It is a rainy, cloudy day and you are standing outside under an umbrella. ____________________________

3. It is midnight and there are no lights on anywhere. ____________________________

4. It is a bright, sunny day at the beach and you are sitting under a beach umbrella. ____________________________

5. You are swinging outside on a sunny, but cold day. ____________________________

6. What is the main idea of this chapter? _______________________________________________________________
_____________________________________________________
_____________________________________________________
Adverbs that Tell *how*, *when*, and *where*

There is one adverb in each sentence. Draw a triangle around each adverb and a wiggly line under the verb it describes. Then, draw an arrow from the adverb to the verb. On the blank line after the sentence, write whether the adverb tells *how*, *when*, or *where*.

1. I am going to a birthday party tomorrow. ________________________
2. The dog slept outside. ________________________
3. I always ride the bus to school. ________________________
4. John has never taken the train. ________________________
5. Mary left her coat here. ________________________
6. Dad clapped loudly. ________________________
7. It snowed everywhere. ________________________
8. He picked up the baby carefully. ________________________
9. I ate my peas last because I don’t like them. ________________________
10. The squirrel quickly gathered some acorns. ________________________
11. Please stack the books there. ________________________
12. I read my book silently. ________________________
Words with Suffixes $-y$ and $-al$

Add the correct suffix to the root word provided. Write the new word in a sentence.

1. Root word: mess
   Add $-y$ or $-al$ to make: ____________

2. Root word: magic
   Add $-y$ or $-al$ to make: ____________

3. Root word: culture
   Add $-y$ or $-al$ to make: ____________
4. Root word: *dirt*
Add –*y* or –*al* to make: ________________

5. Root word: *rust*
Add –*y* or –*al* to make: ________________

Circle the word that matches the meaning.

1. Meaning: related to sounds made by voices or instruments and arranged in a way that is pleasing to hear
   
   Word: music musical

2. Meaning: the unplanned occurrence of good events
   
   Word: luck lucky

3. Meaning: related to stories about things that are not real
   
   Word: fictional fiction
4. Meaning: full of a natural white substance used to flavor and preserve food

Word: salt salty

5. Meaning: the process of eating the right kind of food so you can be healthy and grow properly

Word: nutritional nutrition

6. Meaning: full of spirals or winding shapes

Word: curly curl
Word Sort

Identify the headers. Read the words in the box and circle the vowels that have the /ee/ sound. Write the words under each header that match the header’s spelling pattern.

‘y’ > /ee/  ‘e’ > /ee/  ‘i’ > /ee/  ‘e’ > /ee/

____________ _____________ _____________ _____________

____________ _____________ _____________ _____________

____________ _____________ _____________ _____________

‘ee’ > /ee/  ‘ie’ > /ee/  ‘ey’ > /ee/  ‘e_e’ > /ee/

____________ _____________ _____________ _____________

____________ _____________ _____________ _____________

____________ _____________ _____________ _____________

skied   debate   greeting   piano   recess
early   handy   wheat   honey   sweat
funny   element   sweet   seaside   recipe
cope   valley   head   Chinese   yellow
great   fly   bedding   fried   radiant
How Are Shadows Made?

Do you remember any interesting facts about how light travels? In the last chapter, you learned that it travels in waves that can be measured as wavelengths. You also learned that it travels at a very high rate of speed. Here’s another interesting fact—light waves travel from a source in straight lines that spread out in all directions, like rays.

Take a look at the image on the opposite page. In this image, there are several light sources. Each source or dot of light has several rays of light shooting out. Put your finger on the source you can see. Now, using your finger, trace the lines of light coming out from that source. Each ray of light is a straight line.

Have you ever wondered what happens when a line or path of light bumps into something in its way? Different things may happen depending on what exactly is in the light’s path.

If a path of light hits something that is transparent, most of the light will pass right through. Air, water, and glass are all transparent. When light hits these transparent objects, it passes through to the other side. It is almost as if the object isn’t there.

Most buildings have glass windows so that natural sunlight can travel from the outdoors inside. Have you ever been in a building that has a glass roof or skylight? Sometimes you can even see blue sky and clouds through the skylight!

Light cannot travel through all materials. If a path of light hits something that is opaque, the light is absorbed and blocked by the object. It cannot continue in a straight line through the object. Wood, cardboard, and even a person’s body are all opaque objects. Light cannot pass through to the other side. Instead, a shadow is created because the light is absorbed.

Look around your classroom. Do you see transparent objects through which light is passing? Can you also find opaque objects? You will probably find that your classroom has many more opaque objects than transparent objects. Do you see any shadows?

The shadow created by blocked light takes on the shape of the object. Can you guess the object or objects that are making the shadows in these images?
Adverbs that Tell *how*, *when*, and *where*

There is one adverb in each sentence. Draw a triangle around each adverb and a wiggly line under the verb it describes and draw an arrow from the adverb to the verb. On the blank line after the sentence, write whether the adverb tells *how*, *when*, or *where*.

Example: The nurse gently cleaned my cut finger. **how**

1. I carried the newspaper inside. ________________________

2. I will wash the dishes later. ________________________

3. The people folded the laundry there. ________________________

4. Sam ripped his pants today. ________________________

5. The boys whispered quietly. ________________________

6. Beth has never met her aunt. ________________________

7. The boy pounded his fists madly. ________________________

8. My dog always wags his tail. ________________________

9. Sometimes I walk home from school. ________________________
Spelling Assessment

As your teacher calls out the words, write them under the correct header.

‘y’ > /ee/

______________________
______________________
______________________
______________________

‘ey’ > /ee/

______________________
______________________
______________________
______________________

‘ee’ > /ee/

______________________
______________________
______________________
______________________

‘i’ > /ee/

______________________
______________________
______________________
______________________
<table>
<thead>
<tr>
<th>‘ea’ &gt; /ee/</th>
<th>‘ie’ &gt; /ee/</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>‘e’ &gt; /ee/</td>
<td>‘e_e’ &gt; /ee/</td>
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<td></td>
</tr>
</tbody>
</table>

Challenge Word: ____________  Challenge Word: ____________

Content Word: ______________

Dictated Sentences:

1. ______________________________________________________________________
   ______________________________________________________________________

2. ______________________________________________________________________
   ______________________________________________________________________
Mirrors and Lenses

Write plane, convex, or concave on the line for each mirror. Then, look back in the Reader to find the page numbers where the information can be found.

- kaleidoscope (mirrors) Page _____
- solar hot dog cooker (mirror) Page _____
- corner mirror (mirror) Page _____
According to the selection, which of the following is true?

A. Plane mirrors are curved inward.
B. Concave mirrors are curved inward.
C. Convex mirrors are curved inward.
D. All of the above.
Choose An Adverb

With your group, write an adverb to describe the verb in the sentence. Do not use the same adverb more than once. Review the example if needed.

We ran quickly to the car when the storm started.

**Adverb:** quickly **Verb described by adverb:** ran

1. We _____________________ hammered the nail into the wall so we could hang the heavy picture.

   **Adverb:** ____________ **Verb described by adverb:** ____________

2. The squirrel _____________________ crawled down the tree to gather some nuts.

   **Adverb:** ____________ **Verb described by adverb:** ____________

3. He _____________________ walked to the door to let the dog in.

   **Adverb:** ____________ **Verb described by adverb:** ____________

4. Ross ______________ read the story about the fire to himself.

   **Adverb:** ____________ **Verb described by adverb:** ____________

5. Other students on the bus _____________________ sang a song they had learned in music.

   **Adverb:** ____________ **Verb described by adverb:** ____________
Write a sentence using the following adverbs:

1. bravely

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Adverb: ____________  Verb described by adverb: ____________

2. proudly

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Adverb: ____________  Verb described by adverb: ____________

3. secretly

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Adverb: ____________  Verb described by adverb: ____________
Dictionary Skills

Use the following portion of a dictionary page to answer the questions below.

<table>
<thead>
<tr>
<th>chest</th>
<th>chisel</th>
</tr>
</thead>
</table>

**chief**
1. *noun* A leader of a group.  
2. *adjective* Most important or main.

**chimney**
*noun* A pipe that carries smoke out of a building, usually through the roof.

1. What are the two guide words on the page?

________________________  ______________________

2. What are the two entry words on the page?

________________________  ______________________

3. How many definitions are there for *chief*?

________________________

4. Would the word *choir* be on this page?

________________________

5. Circle the word(s) that would come before *chest* from the following list: choke, cherry, chestnut.
6. Which definition of *chief* matches the use of the word in the sentence:

The *chief* of police is a friend of mine. ________________

What part of speech is *chief* in this sentence? ________________

7. Which definition of *chief* matches the use of the word in the sentence:

My *chief* reason for going to the movies was to see my favorite actor. ________

What part of speech is *chief* in this sentence?_______________
Dear Family Member,

Please help your child succeed in spelling by taking a few minutes each evening to review the words together. Helpful activities for your child to do include: spelling the words orally, writing sentences using the words, or simply copying the words.

Spelling Words

This week, we are reviewing three of the seven spelling patterns for /ae/. Your child learned to spell words with the /ae/ sound in second grade, so this should be a review. On Friday, your child will be tested on these words.

Students have been assigned two Challenge Words, family and young. Challenge Words are words used very often. Neither Challenge Word follows the spelling pattern of /ae/.

The Content Word for this week is straight. This word is directly related to the material that we are reading in Adventures in Light and Sound. The Content Word is an optional spelling word for your child. If your child would like to try it but gets it incorrect, it will not count against him or her on the assessment. We encourage everyone to stretch themselves a bit and try to spell this word.
The spelling words, including the Challenge Words and the Content Word, are listed below:

1. subway
2. daydreams
3. payment
4. daisies
5. awaited
6. obtain
7. ballplayers
8. breaker
9. yesterday
10. betrayer
11. crayons
12. beefsteak
13. explain
14. dainty
15. mermaid
16. trainees
17. great
18. giveaway
19. Challenge Word: family
20. Challenge Word: young

Content Word: straight

**Student Reader**

The chapters your child will read this week in *Adventures in Light and Sound* include information about refraction and lenses, color and light, what sound is, and the characteristics of sound. Be sure to ask your child each evening about what he or she is learning.

Students will take home text copies of the chapters in the Reader throughout the unit. Encouraging students to read a text directly related to this domain-based unit will provide content and vocabulary reinforcement. Please remind your child that the glossary can be used for finding the meaning of the bolded words.
Mirrors and Reflections

Have you been to the dentist recently? Do you remember if he or she used a tool with a mirror to look at your teeth? Think for a minute about how useful that mirror is. Why does the dentist use it? This simple tool allows him or her to see the back of your teeth. He or she can also see teeth way in the back of your mouth. Without it, he or she couldn’t do his or her job nearly as well! Ask to see this tool the next time you’re at the dentist.

So what is a mirror? A mirror has a smooth, shiny surface that reflects light. Light that is reflected bounces off of something in its path. You have already learned that light travels in a straight line, unless it runs into something in its way. If light hits a transparent object, it passes right through the object. If it hits an opaque object, the light is absorbed and blocked so a shadow is made. If light hits a smooth, shiny surface like a mirror, it is reflected.

When a mirror is made, glass is coated with hot, silvery metals and then cooled. This coating makes the mirror shiny so it reflects back all the light that hits it.

Did you know that there are different types of mirrors? You probably use a plane mirror every morning when you get ready for school. A plane mirror has a more or less flat surface. The reflection of something in a plane mirror is almost the same size as the real object.

Plane mirrors are used in many tools. Cameras, telescopes, and microscopes sometimes use plane mirrors. Some toys even use plane mirrors. Have you ever looked through a toy called a kaleidoscope? A kaleidoscope is a tube with plane mirrors inside. There are also tiny bits of colored glass and beads sealed up inside the kaleidoscope. You look through a small hole at one end of the kaleidoscope and point it toward the light. As you
rotate the tube, you will see beautiful, colored patterns.

There are two other types of mirrors that are different from plane mirrors. Plane mirrors have flat surfaces, but concave and convex mirrors have curved surfaces. The smooth, shiny side of a concave mirror curves inward like a spoon. The smooth, shiny side of a convex mirror curves outward.

Here’s another way that concave and convex mirrors are different from plane mirrors. Remember that in a plane mirror, the reflection of an object is about the same size as the object. In concave and convex mirrors, the reflection can look larger or smaller than the real object.

Concave and convex mirrors are also useful. Concave mirrors can be used to provide heat using the light from the sun. Remember that sunlight is a form of light and heat energy. The large concave mirror in the image on the next page reflects the sun’s energy so that people can warm their hands or bodies outside.

What about convex mirrors? The next time you get on a bus, take a look at the mirrors on the sides of the bus. Most buses and large trucks have a small, extra convex mirror on the side-view plane mirror. The convex mirror makes objects look smaller but shows a wider area so you can see more. It helps drivers avoid hitting something they might not see in the regular plane mirror.

So now you see how useful mirrors are in our everyday lives. Mirrors can also be a lot of fun. A circus or carnival sometimes has a place called the “Funhouse,” or “House of Mirrors.” If you go in, there are lots of concave and convex mirrors. When you look in these mirrors, you might not recognize yourself! Your reflection is distorted. What makes that happen? Now you know it’s concave and convex mirrors.
How Are Shadows Made?

Do you remember any interesting facts about how light travels? In the last chapter, you learned that it travels in waves that can be measured as wavelengths. You also learned that it travels at a very high rate of speed. Here’s another interesting fact—light waves travel from a source in straight lines that spread out in all directions, like rays.

Take a look at the image on the opposite page. In this image, there are several light sources. Each source or dot of light has several rays of light shooting out. Put your finger on the source you can see. Now, using your finger, trace the lines of light coming out from that source. Each ray of light is a straight line.

Have you ever wondered what happens when a line or path of light bumps into something in its way? Different things may happen depending on what exactly is in the light’s path.

If a path of light hits something that is transparent, most of the light will pass right through. Air, water, and glass are all transparent. When light hits these transparent objects, it passes through to the other side. It is almost as if the object isn’t there.

Most buildings have glass windows so that natural sunlight can travel from the outdoors inside. Have you ever been in a building that has a glass roof or skylight? Sometimes you can even see blue sky and clouds through the skylight!

Light cannot travel through all materials. If a path of light hits something that is opaque, the light is absorbed and blocked by the object. It cannot continue in a straight line through the object. Wood, cardboard, and even a person’s body are all opaque objects. Light cannot pass through to the other side. Instead, a shadow is created because the light is absorbed.

Look around your classroom. Do you see transparent objects through which light is passing? Can you also find opaque objects? You will probably find that your classroom has many more opaque objects than transparent objects. Do you see any shadows?

The shadow created by blocked light takes on the shape of the object. Can you guess the object or objects that are making the shadows in these images?
The size of a shadow depends on several different things. The closer an object is to a light source, the larger the shadow will be. If you move the same object farther away from the light source, the shadow will become smaller. So the size of the shadow changes, even though the size of the object does not. What makes the shadow larger or smaller is the distance of the object from the source of light.

You can experiment making larger and smaller shadows just by using your hand. You will need:

- a light source, such as a flashlight or projector
- several sheets of large white paper and a marker
- masking tape
- a cardboard cutout of a tree

First, tape a piece of white paper to the wall. Then, mark a spot on the floor and tell a classmate to stand on that spot to project the light. He or she should not move. Now, try holding the cutout of the tree in front of the light so that a shadow is projected onto the white paper. Have one classmate put a piece of masking tape marked “1” on the floor next to where you are standing. At the same time, another classmate should trace the shadow of the tree on the white paper. Mark this tracing of your shadow with a “1.”

Next, tape up another sheet of white paper. This time, move away from the light, closer to the sheet of paper. Have your classmates mark the floor and shadow tracing with a “2.”

Last, try it one more time. This time move closer to the light—even closer than the spot marked “2.” Have your classmates mark the floor and shadow tracing with a “3.”

Now, compare the tracings. Which is the biggest? Where were you standing in relation to the light when the tree made the biggest shadow? Where were you standing when the tree made the smallest shadow?

You can have even more fun making shadows with your hands. Try making the shadows in these drawings. Look carefully at one drawing at a time. Try placing your hands exactly as shown in the drawing. Practice several times. When you think you have it right, try making the shape in front of the light. If you get really good, you might want to put on a show for your family!
Dear Family Member,

We learned about shadows in our lesson today. We have provided a portion of the chapter here so that your child may show you how to make some fun shadows. We hope you enjoy doing this activity with your child.
Refraction and Lenses

If the sentence is true, write true on the first blank. If the sentence is false, write false on the blank following the sentence and correct the sentence by rewriting it, changing the incorrect part of the sentence. Add the page number where you found your answer.

1. Light travels in curvy lines. _____________________

   ____________________________________________

   ____________________________________________

   Page _____

2. Shadows are formed because light is absorbed by a transparent object. ________

   ____________________________________________

   ____________________________________________

   Page _____

3. The denser an object is the more quickly light travels through it. ____________

   ____________________________________________

   ____________________________________________

   Page _____
4. Light rays change and appear to bend when light travels through just one transparent object. ________________

__________________________________________________________________________________

__________________________________________________________________________________  

Page _____

5. A magnifying glass is a good example of a concave lens. ________________

__________________________________________________________________________________

__________________________________________________________________________________  

Page _____

6. Peepholes make objects look larger. ________________

__________________________________________________________________________________

__________________________________________________________________________________  

Page _____
**Build Sentences**

Read each simple sentence. Then, brainstorm adjectives, adverbs, and synonyms that you might add to the sentence, and write these words in the boxes provided. You do not need to write words in every box, but try your best. Write a new, more interesting sentence in the blank space provided, using some of the adjectives and adverbs.

<table>
<thead>
<tr>
<th>Starter Sentence: The Romans fought the enemy.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adjectives to describe</strong></td>
</tr>
<tr>
<td>the Romans</td>
</tr>
<tr>
<td>Synonyms for <strong>fought</strong></td>
</tr>
</tbody>
</table>

New Sentence: ___________________________________________________________
**Starter Sentence:** The king treated the people.

<table>
<thead>
<tr>
<th>Adjectives to describe <strong>the king</strong></th>
<th>Adjectives to describe <strong>the people</strong></th>
<th>Adverbs to describe <strong>how</strong></th>
<th>Adverbs to describe <strong>where</strong></th>
<th>Adverbs to describe <strong>when</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms for <strong>treated</strong></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**New Sentence:** ____________________________________________________________

________________________

________________________

________________________

________________________
Refraction and Lenses

In the previous chapters, you have been reading about how light travels. You already know that light travels at a very fast speed—faster than any machine made by humans.

You also know that light travels in a straight line, unless it runs into something in its way.

One of the things we haven’t studied yet is what happens to the speed of light when it passes through something transparent. As fast as light is, when it passes through something transparent, it does slow down. So, when light passes through windows, water, and even air, it slows down. The denser or heavier something is, the slower light travels through it. For example, light travels more slowly through glass than it does through water or air. It travels more slowly through water than it does through air.

When light moves through one thing that is transparent to something different that is transparent, it changes speed. When light changes speed, the angle of the light rays change and appear to bend.

Take a straw and put it in a glass of water. Now, look at the straw where it enters the water. Can you see that it appears to be at a different angle? That is called refraction. It’s caused by the slowing down of light as it moves from air to water. As the light enters the water, it changes angle direction because it slows down. It seems like magic, but it’s really just how light travels—no trick.

You may be surprised to learn that there are many ways that we use light refraction every day. Do you or any of your classmates wear eyeglasses? The lenses in eyeglasses correct different kinds of vision problems by refracting light. Transparent glass or plastic lenses are made to refract light in different ways. Like mirrors, these lenses can be convex lenses or concave lenses.
Remember that something convex curves outward. A convex lens refracts and bends light rays closer together. When you look through a convex lens, an object will look larger and closer. It looks magnified because the light rays are closer together.

A concave lens curves inward. A concave lens refracts and spreads light rays apart. If you look through a concave lens, an object will look smaller. It looks smaller because the light waves are spread apart.

A magnifying glass is an example of a simple convex lens. If you hold and look at something closely through a magnifying glass, it will look larger. People use a magnifying glass to more clearly see the details of something small.

Convex lenses are also found in scientific instruments. A scientist might look through a microscope with a convex lens. The lens magnifies very small things that cannot be seen with the naked eye.

Scientists study outer space with telescopes. Telescope lenses are also convex. They make the moon, stars, and planets look larger and closer so scientists can learn more about them.

Convex lenses are also useful. Remember that concave lenses spread out light rays. Concave lenses are used in security cameras because they provide a wider view of a place.

Do you have a peephole in your door at home? If so, you may have a concave lens. In many homes and apartments, the peepholes of doors have two lenses, one of which is concave. The other lens is convex and magnifies the image made by the concave lens. The people looking in from the outside can barely see what’s inside. (Remember, concave lenses make things look smaller.) However, if you are looking from the inside out, you can see who is standing in front of your door.
Color and Light

Take notes as you read, using the questions to guide you.

1. What is a prism and what is it used for?

________________________________________

________________________________________

________________________________________

2. Why does the sun look yellow?

________________________________________

________________________________________

________________________________________

3. What creates a rainbow after it rains? How can we see it?

________________________________________

________________________________________

________________________________________

4. What are the colors of a spectrum?

________________________________________

________________________________________

________________________________________
5. Why does clothing appear to be certain colors?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

6. What is ultraviolet light and what can happen as a result of it?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

7. What are x-rays and how would they be used?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

8. What makes your remote control for the TV work?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
Word Shelf

Suffix –ous
means full of or having

joyous
dangerous
mountainous
poisonous
-ous: Suffix meaning “full of”

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>joyous</td>
<td>(adjective) full of a feeling of great happiness</td>
</tr>
<tr>
<td>dangerous</td>
<td>(adjective) full of the chance that something bad will happen</td>
</tr>
<tr>
<td>mountainous</td>
<td>(adjective) full of land that rises very high above its surroundings</td>
</tr>
<tr>
<td>poisonous</td>
<td>(adjective) full of a substance that can hurt or kill people or animals if touched, swallowed, or inhaled</td>
</tr>
</tbody>
</table>

Write the correct word to complete each sentence.

famous poisonous mysterious furious dangerous humorous

1. The ________________ ending to the movie had everyone in the theater laughing.

2. When I got to school, there was a ________________ smell in our classroom and I couldn’t figure out what it was coming from.

3. My ________________ brother could not believe our little sister has scribbled all over his history paper with crayons.

4. A ________________ basketball player is said to be coming to our community fair next week but nobody knows who it is.
5. Some farmers put _______________ chemicals on their crops to keep the bugs from eating them but they can be harmful to people who eat the food.

Write your own sentence using the one word left in the box.

6. __________________________________________________________________________________
__________________________________________________________________________________
Suffix –ly
means *in a _____ way*

- furiously
- mysteriously
- dangerously
- famously
### –ous: Suffix Meaning “full of”

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>furiously</td>
<td>(adverb) in a furious way</td>
</tr>
<tr>
<td>mysteriously</td>
<td>(adverb) in a mysterious way</td>
</tr>
<tr>
<td>dangerously</td>
<td>(adverb) in a dangerous way</td>
</tr>
<tr>
<td>famously</td>
<td>(adverb) in a famous way</td>
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</tbody>
</table>

Write the correct word to complete each sentence.

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>dangerously</td>
<td>furiously mysteriously famously humorously</td>
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</tbody>
</table>

1. My cell phone ________________ turned itself off when I put it down on the table.

2. My uncle ________________ asked his girlfriend to marry him at the family reunion in a way that nobody will forget.

3. My sister ________________ wore a small hat for a baby as part of her costume for the party.

4. A little boy in the subway station walked ________________ near the edge of the passenger platform above the tracks.
Write your own sentence using the one word left in the box.

5. _____________________________________________________________

_____________________________________________________________
# Build Sentences

Read each simple sentence. Then, brainstorm adjectives, adverbs, and synonyms that you might add to the sentence, and write these words in the boxes provided. You do not need to write words in every box, but try your best. Write a new, more interesting sentence in the blank space provided, using some of the adjectives and adverbs.

## Starter Sentence: The lion made a loud noise.

<table>
<thead>
<tr>
<th>Adjectives to describe <strong>the lion</strong></th>
<th>Adverbs to describe <strong>how</strong> the lion made a loud noise</th>
<th>Adverbs to describe <strong>when</strong> the lion made a loud noise</th>
<th>Adverbs to describe <strong>where</strong> the lion made a loud noise</th>
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</table>

**Synonyms for made a loud noise**

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**New Sentence: ________________________________________________**

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</tbody>
</table>
Starter Sentence: The gladiator walked.

<table>
<thead>
<tr>
<th>Adjectives to describe the gladiator</th>
<th>Adverbs to describe how he walked</th>
<th>Adverbs to describe where he walked</th>
<th>Adverbs to describe when he walked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms for walked</td>
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</table>

New Sentence: ____________________________

____________________________

____________________________

Starter Sentence: The children played.

<table>
<thead>
<tr>
<th>Adjectives to describe the children</th>
<th>Adverbs to describe how they played</th>
<th>Adverbs to describe where they played</th>
<th>Adverbs to describe when they played</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms for played</td>
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<td></td>
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</tbody>
</table>

New Sentence: ____________________________

____________________________

____________________________
Blank Busters

<table>
<thead>
<tr>
<th>subway</th>
<th>payment</th>
<th>awaited</th>
<th>ballplayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>yesterday</td>
<td>great</td>
<td>crayons</td>
<td>explain</td>
</tr>
<tr>
<td>mermaid</td>
<td>obtain</td>
<td>breaker</td>
<td>daydreams</td>
</tr>
<tr>
<td>daisies</td>
<td>dainty</td>
<td>trainees</td>
<td>betrayer</td>
</tr>
<tr>
<td>beefsteak</td>
<td>giveaway</td>
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</tbody>
</table>

Challenge Word: family
Challenge Word: young
Content Word: straight

Fill in the blanks in the sentences below with one of the spelling words in the chart. Only if needed, add a suffix to the end of a word in order for the sentence to make sense: –s, –ed, –ing, or –ier.

1. At the end of their meal, the waitress ________________ change from the cashier for her customers.

2. The butcher offered many ________________ of free ________________.

3. The talented artist puts her ________________ aside and uses oil paint on these portraits.

4. Our beautiful, yellow ________________ finally bloomed ________________.

5. The smallest ________________ was the only one who could wear the ________________ seashell necklace.

6. The ride on the ________________ car was very scary because the lights went out.
7. Our ____________ is made up of two adults and five ____________ children.

8. The ____________ were lost in their ______________ and didn’t pay attention to the game, so they lost.

9. My teacher is ______________ multiplication so I better pay attention!

10. Our long ______________ Spring Break is approaching!

Write three sentences using spelling words of your choice that were not used in the first ten sentences. Make sure to use correct capitalization and punctuation. You may use the Challenge Words or Content Word in your sentences.

1. _______________________________________________________________________

2. _______________________________________________________________________

3. _______________________________________________________________________
Color and Light

Do you remember what color sunlight is? I hope you didn’t say, “No color!” You learned that sunlight is white light. You also learned that instead of being “no color,” white light is made up of all the colors of the rainbow. Remember, the sun looks yellow because it gives off more yellow light than it does the other colors.

You can prove that white light is really many colors if you have a wedge-shaped piece of transparent glass called a prism. If you hold a prism near a sunny window, light will shine through and make a rainbow-like band of colors. This shows that white light is really made up of all colors.

Do you remember what you learned about refraction? What happens to light when it passes through something transparent like glass? The light slows down and changes its path. A prism has a special shape that refracts white light into all of the colors of the rainbow.

Have you ever seen a rainbow in the sky when the sun comes out after it rains? Raindrops in the sky refract the light, just like a prism. This is what creates the rainbow.

When white light is refracted, it often separates into a combination of colors called the spectrum. The colors in the spectrum always appear in the same order: red, orange, yellow, green, blue, indigo, and violet. These colors are part of the visible light spectrum. They are the light waves that humans can see. The colors of visible light are a result of differences in wavelength. Red light has long wavelengths and violet light has short wavelengths.

You can remember the names of the colors in the visible light spectrum in the right order if you can remember this funny name: “Roy G. Biv.” Each
letter in that name stands for a color in the rainbow. Say it out loud. Try to remember it!

Did you know that the color of any object depends on what light wavelengths it reflects? Different objects absorb light wavelengths of some colors, but reflect others. This is what creates color.

Blue jeans appear blue because something in the **material** reflects blue light and absorbs all of the other light colors. Do you see anyone in your class today wearing a red sweater? The sweater appears red because something in the **material** reflects red light and absorbs all of the other light.

What about things that appear to be white? They look white because the object reflects all of the white light wavelengths and doesn’t absorb any light. Can you guess why something looks black? Things that appear black do not reflect any light. They absorb all of the light wavelengths.

Remember that the colors we see are from light of specific wavelengths. But, there is much more to light than just the wavelengths we can see. In fact, visible light is only a small part of the energy waves that come from sunlight.

For example, on the shorter wavelength end of the light **spectrum**, there are invisible **ultraviolet** light waves that cause sunburn. X-rays are even shorter wavelengths of light. We can’t see these light x-rays but they can travel through the human body. You learned in *How Does Your Body Work?* that x-rays are used to create black and white photos of what’s inside the body. Do you know of any other ways that x-rays are used?

Another type of invisible light is **infrared** waves. The wavelengths of **infrared** light are longer than those of red light. These are the type of light waves that you use when you click on the **remote control** to change television channels!
# Sound

<table>
<thead>
<tr>
<th><strong>What is it?</strong></th>
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<tr>
<td><strong>How do we get it?</strong></td>
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<td><strong>How does it travel?</strong></td>
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<tr>
<td><strong>Speed of Sound vs. Speed of Light</strong></td>
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<td><strong>Pitch</strong></td>
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<td><strong>Volume</strong></td>
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<td><strong>Human Voices</strong></td>
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</table>
What Is Sound?

With your Reader closed, use the words in the box to fill in the blanks below. Then, check your work by looking back in the Reader and writing the page numbers where you found the answers.

medium  gas  750 mph  
energy  solid  farther  
vibrating  186,000 mps  waves  

1. Sound is a form of __________________ that moves in __________________.
   Page _____

2. Sound waves move out from a __________________ object.
   Page _____

3. The __________________ away you get, the weaker sounds become.
   Page _____

4. Sound waves need a __________________ to carry them.
   Page _____

5. Sound travels faster through a __________________ than a __________________.
   Page _____
6. Sound travels at this speed: __________________

Page _____

7. What is the meaning of the word medium in this sentence from the selection? There is no sound in outer space because there is no medium to carry it.

A. a substance that creates color
B. a substance that sound is unable to travel through
C. a substance that sound travels through
D. a substance that creates spectrums
Grammar Review

Read each sentence. Circle the noun(s), draw a wiggly line under the verb(s), draw a box around the adjective(s), and draw a triangle around the adverb(s). For adjectives, draw an arrow to the noun described, and for adverbs, draw an arrow to the verb described. On the line, write whether the adverb tells how, when or where. Then divide each sentence into subject and predicate.

Example: We ran quickly to catch the last bus. ______________ how

1. The rain poured down and soaked the brown grass. ______________

2. I used blue and green markers during art class. _______________

3. My brother slowly ate his spicy chili. _______________

4. Andy leaves soon for winter vacation. ________________
Read the simple sentence. Then, brainstorm adjectives, adverbs, and synonyms that you might add to the sentence and write these words in the boxes provided. You do not need to write words in every box, but try your best. Write a new, more interesting sentence in the blank space provided, using some of the adjectives and adverbs.

Starter Sentence: Androcles helped the lion.

<table>
<thead>
<tr>
<th>Adjectives to describe</th>
<th>Adjectives to describe</th>
<th>Adverbs to describe</th>
<th>Adverbs to describe</th>
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<tbody>
<tr>
<td><strong>Androcles</strong></td>
<td><strong>the lion</strong></td>
<td><strong>how</strong> Androcles helped</td>
<td><strong>when</strong> Androcles helped</td>
</tr>
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</table>

Synonyms for **helped**

New Sentence: ____________________________________________________________

________________________________________________________________________

________________________________________________________________________
Practice Using Suffixes –*ous* and –*ly*

Choose the correct word to complete each sentence. Write the word and its part of speech below the sentence.

1. We attended the __________ party to celebrate Michael’s graduation.
   
   Word: ______________ Part of Speech: ______________

2. My new pen __________ appeared on my desk after dinner even though it was not there before we ate.
   
   Word: ______________ Part of Speech: ______________

3. For a history project, we had to write a biography of a __________ person from the American Revolution.
   
   Word: ______________ Part of Speech: ______________

4. The __________ troll shouted at the Billy Goats Gruff.
   
   Word: ______________ Part of Speech: ______________

5. The crane at the construction site sways __________ when there is a thunderstorm with lots of wind.
   
   Word: ______________ Part of Speech: ______________

6. The actor in the play __________ sang while dressed in a ridiculous costume.
   
   Word: ______________ Part of Speech: ______________
7. Our neighbor ________ announced that his son was admitted to the college he likes the most.

   Word: _______________ Part of Speech: _______________

   (joyous, joyously)

8. The governor had a ____________ response to a serious question during the interview.

   Word: _______________ Part of Speech: _______________

   (humorously, humorous)

Bonus: Circle the correct answer and write the part of speech.

1. Which of the following words means “full of care to avoid danger or mistakes”?

   cautious cautiously

   Part of Speech: ______________________________

2. Which of the following words means “in a curious way”?

   curiously curious

   Part of Speech: ______________________________

3. Which of the following words means “full of something wonderful”?

   fabulously fabulous

   Part of Speech: ______________________________
Word Sort

Identify the headers. Read the words in the box and circle the vowels that have the /ae/ sound. Write the words under each header that match the header’s spelling pattern.

<table>
<thead>
<tr>
<th>‘ay’ &gt; /ae/</th>
<th>‘ai’ &gt; /ae/</th>
<th>‘ea’ &gt; /ae/</th>
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</tbody>
</table>

paid  breakneck  headers  maybe  sailing
monkey  waylay  read  prairie  mailman
maids  aisle  bricklaying  waiter  always
bluejay  raisins  greatest  despair  prepaid
What Is Sound?

An alarm clock rings, a dog barks, a voice calls, “Time to get up!” Every day is full of familiar sounds but what exactly is sound?

Sound is caused by a back and forth movement called vibration. Try this. Close your lips and hum. While you are humming, feel your throat under your chin. Do you feel something buzzing or vibrating? What you feel is caused by something moving back and forth very fast. When you hum, the vocal cords in your throat vibrate back and forth. This makes the air around them vibrate, which then creates the sound you hear.

Sound, like light, is a form of energy. Also like light, sound moves in waves. Sound waves move out from a vibrating object, making the air move back and forth in a way that we can’t see.

Two things must happen to create a sound. First, something needs to vibrate and create sound waves. Then, something like air or another medium needs to carry the sound waves. You hear sounds more clearly if you are close to whatever is vibrating and making the sound waves. The farther away that the sound waves spread out, the weaker they get. That is why you can hear a friend standing right next to you better than if they are calling to you from across the street.

Sound travels not only through air, which is a gas, but through other mediums. In fact, sound can travel through solids, liquids, and gases.

Think about sound traveling through solids, like a window or even a closed door. If you are close enough, you can still hear sounds on the other side of a window or door.

How about liquids? Have you ever been underwater in a swimming pool when you have heard someone’s voice or another sound? It probably sounded different than it would if you were not under water, but you were still able to
hear it. This is an example of sound traveling through a liquid—the water in the pool.

One place that sound cannot travel is in outer space. Sound cannot travel through the emptiness, or vacuum, of space. There is no sound in outer space because there is no medium to carry it.

You might wonder about the speed at which sound travels. Sound waves travel much slower than light waves. Sound waves travel at about 750 miles per hour. That’s fast, but not close to the 186,000 miles per second that light can travel. It would take a sound 33 hours to travel around Earth once. Remember that light can go seven times around Earth every second!

Here’s an example to prove that light travels faster than sound. Think about the last time you were around a storm with thunder and lightning. Did you notice that you saw each flash of lightning before you heard the clap of thunder? That’s because light travels faster than sound!

The medium through which sound travels affects its rate of speed. Interestingly, sound waves travel fastest through solids. In old western movies, you may have seen a cowboy put his ear down to the steel railroad tracks to hear if a train is coming. That is because the sound travels faster through the steel than through the air.

Try this. Listen while you drum your fingers on your desk. Now, rest your ear right on the surface of the desk and drum your fingers again. Which way sounded louder?

The sound was louder when you put your head on the desk. This is because the sound traveling through the solid wood of your desk traveled faster than if it had first traveled through the air. Every time sound changes mediums, it loses some of its loudness.
### Spelling Assessment

As your teacher calls out the words, write them under the correct header.

<table>
<thead>
<tr>
<th>‘ay’ &gt; /ae/</th>
<th>‘ai’ &gt; /ae/</th>
<th>‘ea’ &gt; /ae/</th>
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</table>

**Challenge Word:** __________

**Content Word:** ______________
Dictated Sentences:

1. ______________________________________________________
   _________________________________________________________.

2. ________________________________________________________
   _________________________________________________________.
Characteristics of Sound

1. What is pitch?
   A. Pitch is how loud or soft a sound is.
   B. Pitch is how high or low a sound is.
   C. Pitch is how fast sound travels through a medium.
   D. Pitch is the intensity of a sound.

2. What is volume?
   A. Volume is how high or low a sound is.
   B. Volume is the intensity of a sound.
   C. Volume is how long or short a sound wave is.
   D. Volume is how fast sound travels through a medium.

3. Describe how the length of sound waves affects pitch.

   __________________________________________

   __________________________________________

4. List three sources of a low-pitched sound.

   __________________________________________

   __________________________________________

   __________________________________________
5. Which of these books would be the best to find out more facts about the characteristics of sound?
   A. *Adventures in Light*
   B. *Can You Hear Me Now?*
   C. *All About Animals*
   D. *Experiments with Food*

6. Read this sentence from the selection: *Very loud sounds can damage your hearing.* Based on the sentence, which phrase best describes what loud sounds can do.
   A. They can make you hear well.
   B. They can hurt your hearing.
   C. They can make you able to hear from great distances.
   D. They can make you able to hear a whisper better.

7. How would the world be different if all sounds were the same pitch and volume?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
# Build Sentences

Read each simple sentence. Then, brainstorm adjectives, adverbs, and synonyms that you might add to the sentence, and write these words in the boxes provided. You do not need to write words in every box, but try your best. Write a new, more interesting sentence in the blank space provided, using some of the adjectives and adverbs.

### Starter Sentence: The baby slept.

<table>
<thead>
<tr>
<th>Adjectives to describe</th>
<th>Adverbs to describe</th>
<th>Adverbs to describe</th>
<th>Adverbs to describe</th>
</tr>
</thead>
<tbody>
<tr>
<td>the baby</td>
<td>how the baby slept</td>
<td>when the baby slept</td>
<td>where the baby slept</td>
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</tbody>
</table>

**Synonyms for slept**

**New Sentence:** ________________________________

________________________________________________________________________________________

________________________________________________________________________________________
### Starter Sentence: The general rode his horse.

<table>
<thead>
<tr>
<th>Adjectives to describe the general</th>
<th>Adverbs to describe how he rode his horse</th>
<th>Adverbs to describe where he rode his horse</th>
<th>Adverbs to describe when he rode his horse</th>
</tr>
</thead>
</table>

### Synonyms for rode

New Sentence: ______________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

### Starter Sentence: The boys laughed.

<table>
<thead>
<tr>
<th>Adjectives to describe the boys</th>
<th>Adverbs to describe how they laughed</th>
<th>Adverbs to describe where they laughed</th>
<th>Adverbs to describe when they laughed</th>
</tr>
</thead>
</table>

### Synonyms for laughed

New Sentence: ______________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________
Dictionary Skills

Use the following portion of a dictionary page to answer the questions below.

<table>
<thead>
<tr>
<th>part</th>
<th>pickle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pay</strong> 1. <em>verb</em> To give money to buy something. 2. <em>verb</em> To be worthwhile. 3. <em>noun</em> Money earned from working at a job.</td>
<td></td>
</tr>
<tr>
<td><strong>peck</strong> 1. <em>verb</em> To pick up something with a beak. 2. <em>verb</em> To eat something in small bites with no enjoyment 3. <em>noun</em> A light kiss.</td>
<td></td>
</tr>
</tbody>
</table>

1. **What are the two guide words on the page?**

2. **What are the two entry words on the page?**

3. **Would the word *pill* be on this page?**

4. **Circle the word(s) that would come before *part* in the following list:**
   pattern, peace, pack

5. **Which definition of *pay* matches the use of the word in the sentence:**
   It *pays* to be an honest person. ____________________________________

   **What part of speech is *pay* in this sentence?** ______________________
6. Which definition of *pay* matches the use of the word in the sentence:

My mother receives her *pay* on Fridays. __________________________

What part of speech is *pay* in this sentence? __________________________

7. Write a sentence using the definition of *pay* not already used in the sentences above.

____________________________________________________________________
____________________________________________________________________

8. Which definition of *peck* matches the use of the word in the sentence:

The child *pecked* at her food without eating much. _______________________

What part of speech is *peck* in this sentence? __________________________

9. Which definition of *peck* matches the use of the word in the sentence:

My grandmother gives me a *peck* on my cheek each time I see her. _______

What part of speech is *peck* in this sentence? __________________________

10. Write a sentence using the definition of *peck* not already used in the sentences above.

____________________________________________________________________
____________________________________________________________________
Dear Family Member,

Please help your child succeed in spelling by taking a few minutes each evening to review the words together. Helpful activities for your child to do include: spelling the words orally, writing sentences using the words, or simply copying the words.

Spelling Words

This week, we are reviewing two of the seven spelling patterns for /ae/. Your child learned to spell words with the /ae/ sound in second grade, so this should be a review. On Friday, your child will be assessed on these words.

Students have been assigned two Challenge Words, another and finally. Challenge Words are words used very often. Neither Challenge Word follows the spelling pattern of /ae/.

The Content Word for this week is concave. This word is directly related to the material that we are reading in Adventures in Light and Sound. The Content Word is an optional spelling word for your child. If your child would like to try it but gets it incorrect, it will not count against him or her on the test. We encourage everyone to stretch themselves a bit and try to spell this word.

The spelling words, including the Challenge Words and the Content Word, are listed below:

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<tr>
<td>1.</td>
<td>translate</td>
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<td>2.</td>
<td>major</td>
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<td>3.</td>
<td>nation</td>
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<td>4.</td>
<td>famous</td>
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<td>5.</td>
<td>pancake</td>
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<td>6.</td>
<td>danger</td>
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<td>7.</td>
<td>cascade</td>
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<tr>
<td>8.</td>
<td>escape</td>
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<tr>
<td>9.</td>
<td>refrigerate</td>
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<tr>
<td>10.</td>
<td>invade</td>
</tr>
<tr>
<td>11.</td>
<td>earthquake</td>
</tr>
<tr>
<td>19. <strong>Challenge Word</strong>: another</td>
<td></td>
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<tr>
<td>20. <strong>Challenge Word</strong>: finally</td>
<td></td>
</tr>
<tr>
<td><strong>Content Word</strong>: concave</td>
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</tbody>
</table>
Student Reader

The chapters your child will read this week in Adventures in Light and Sound include information about the characteristics of sound and the human voice. Additional chapters your child may read include information about light and photography, a biography about Alexander Graham Bell, and a biography about Thomas Edison. Be sure to ask your child each evening about what he or she is learning.

Students will take home text copies of the chapters in the Reader throughout the unit. Encouraging students to read a text directly related to this domain-based unit will provide content and vocabulary reinforcement. Please remind your child that the glossary can be used for finding the meaning of the bolded words.
Characteristics of Sound

Let’s review what you have learned so far about sound by comparing it to light. How is sound different from light? Sound must have a medium to travel through—a solid, liquid, or gas. Light does not need a medium. Remember, light can travel through the emptiness, or vacuum, of outer space. Sound cannot.

The speed at which light and sound travel is also different. Light travels much faster than sound.

There are important ways that light and sound are similar. They are both forms of energy that travel in waves. There are also other similarities.

When you learned about light, you learned that light waves can be different lengths. Some are long and some are short. It is the length of a light wave that makes it appear to be a particular color.

Perhaps you are wondering whether sound waves differ from one another. Imagine these two sounds—a baby crying for its mother and an adult yelling. Both of these are sounds. The sound waves of each travel through the same medium, air, so they are alike in that way. But a baby crying surely sounds different than an adult yelling! The baby makes a high-\textit{pitched}, “screeching” sound. When an adult yells, it is a low-\textit{pitched}, deep tone. Could this difference in \textit{pitch}, or how high or how low a sound is, come from different kinds of sound waves?

The answer is yes and it has to do with the length of the sound waves! It helps if we first understand how vibrations affect sound waves. Faster vibrations produce shorter sound waves, which make sounds with a higher \textit{pitch}. The baby’s screeching sound vibrates very rapidly, making shorter,
but more, sound waves. Can you think of some other sounds that have a high pitch?

Slower vibrations produce longer waves, which make sounds with a lower pitch. A yelling voice makes longer, fewer waves so you hear a lower pitch. Pitch describes the highness or lowness of a sound. Can you think of some sounds that have a low pitch?

Try changing your voice pitch. Can you speak in a high, squeaky voice? Can you speak in a low, rumbling voice?

Sound also varies in loudness. If you’re listening to the radio and a favorite song comes on, you might say, “Turn it up!” and reach for the knob marked VOLUME.

When you turn up the volume, you are making the sound louder. A scientist might say that you are increasing the sound’s intensity. More intense sound waves carry more energy and make louder sounds.

How far away you can hear a sound depends on its intensity. A quiet sound, like a whisper, doesn’t travel very far. A really loud sound can travel for hundreds of miles. When fireworks are set off, the sound can be heard miles away.

Very loud sounds can damage your hearing. People who work around loud sounds all day long often wear ear coverings or plugs to protect their hearing. You should be careful, too, not to turn the volume too loud if you like to listen to music.
The Human Voice

Take notes as you read, using the questions to guide you.

1. Describe what happens in your lungs, trachea, and larynx in order for you to make sounds.

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

2. How do your vocal cords work?

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________


3. Do babies need to learn how to breathe? Why or why not?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

4. How did you learn the language you speak?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

5. When you make loud sounds, what happens to make the sounds louder?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
Conjunction *and*

Write the letter ‘S’ over the subjects and the letter ‘P’ over the predicates in each simple sentence. Draw a line to separate the subject and predicate in each simple sentence. Then, join the two simple sentences together using the conjunction *and* to make a compound sentence. Draw two lines under the word *and* to show that it is a conjunction.

Example: The beautiful fish swim in the bowl. They watch me carefully!

\[
\begin{array}{c}
S & P \\
\text{The beautiful fish} & \text{swim in the bowl and they} & \text{watch me carefully!}
\end{array}
\]

1. Sally went to the circus to see the clowns. Her friends joined her there.

_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________

2. The sports car roared down the street. The police car with a siren was right behind it.

_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________

3. The goldfish swims around in its bowl. The children love to watch it swim in circles.

_________________________________________________________________________________
_________________________________________________________________________________
The Human Voice

Have you ever noticed how well you know your mother or grandmother’s voice? You have heard it so often that you can tell right away who it is. Each person has a distinct voice. It’s a voice that can make many sounds with different pitch and intensity. It can make high- and low-pitched sounds, loud and soft sounds.

So how does your body make all of those different sounds? You already know that something needs to vibrate to create sound waves. You also know that sound needs a medium, like air, to travel through. Here’s how it works in the human body.

Air passes in and out of your body all of the time when you breathe. Inside your chest, your lungs expand to take in air and then contract to let it out.

Leading out of your lungs is a long tube called the trachea, or “windpipe.” At the top of your trachea is another part of your body called the larynx, or “voice box.”

Inside the larynx are two bundles of muscle that are known as vocal cords. When you breathe in, the vocal cords relax so that air can move past them and into your lungs. When you speak, you force the air out of your lungs and over the vocal cords in your larynx. The vocal cords vibrate to make waves in the air that continue up your throat and out of your mouth.

When you were a baby, you did not need to learn how to breathe. Your lungs worked automatically, bringing air into and out of your body. You also did not need to learn how to use your vocal cords to make sounds.
When you were a baby, you made lots of funny noises and grunts. Ask your parents!

You did, however, need to learn how to change those grunts and noises into words so you could talk. You did this by listening to the people who talked to you when you were a baby. You practiced saying the same sounds and words. You learned to speak whatever language all of those people were speaking to you. If your family spoke only English to you, you learned to speak English. If your family spoke only Spanish to you, you learned to speak Spanish. People can learn to speak more than one language. Maybe you or some of your classmates speak more than one language.

Your vocal cords grow as you grow. When you have shorter vocal cords, you tend to speak at a higher pitch. This is why small children have higher-pitched voices than adults. The pitch of your voice depends on the size of your vocal cords and larynx.

The volume of your voice, or how loudly you speak, depends on how much air is produced by your lungs and comes out of your mouth. When more air is pushed out of your mouth, your voice will be louder.
Practice the Conjunction *and*

Write the letter ‘S’ over the subjects and the letter ‘P’ over the predicates in each simple sentence. Draw a line to separate the subject and predicate in each simple sentence. Then, join the two simple sentences together using the conjunction *and* to make a compound sentence. Draw two lines under the word *and* to show that it is a conjunction.

<table>
<thead>
<tr>
<th>S</th>
<th>P</th>
<th>S</th>
<th>P</th>
</tr>
</thead>
</table>

Example: Alan | entertained all of us. Eli | served snacks.

Alan entertained all of us, **and** Eli served snacks.


   ________________________________
   ________________________________
   ________________________________
   ________________________________

2. Alan throws lots of parties. The neighbors always come.

   ________________________________
   ________________________________
   ________________________________
   ________________________________

3. Eli makes brownies. The neighbors enjoy them.

   ________________________________
   ________________________________
   ________________________________
   ________________________________
4. Alan likes to entertain. Eli likes to cook.

Challenge: Mark the subject(s) and predicate(s) and underline the conjunction and with two lines in the following sentences. Write ‘Yes’ on the line if the sentence is a compound sentence with two independent clauses and ‘No’ if it is not a compound sentence.

S | P
Example: Meg | baked a cake and chocolate chip cookies. _____ No _____

5. Allen and John rode their bikes to the park. ____________

6. Derek read a book and watched TV last night. ____________

7. My mother cooked dinner and my sister made dessert. ____________
A tuning fork is not the kind of fork you use at the dinner table. It is a fork you might use if you play a musical instrument.

If you strike a tuning fork on a hard surface, the two prongs of the fork will begin to vibrate. That means they are moving back and forth very rapidly. As the prongs vibrate, they give off a sound.

Every tuning fork is designed to vibrate at a certain speed, or frequency. It’s the frequency that determines the pitch of the sound the fork makes. A fork that vibrates fast makes a high-pitched sound. A fork that vibrates more slowly makes a sound with a lower pitch.

Tuning forks make a very pure kind of sound. Most other things do not. If you bang on a kitchen pot, it will make several sounds all at once. You will hear the sound of the thick metal on the bottom of the pot vibrating. You will also hear the sound of the thinner metal on the sides vibrating. You may even hear the sound of the handle vibrating. Each of these parts of the pan will give off a different pitch. The sound you will hear will not be a pure sound. It will be a mix of several different pitches. Tuning forks are not like that. They do not give off a mix of sounds. They emit a single, pure sound.

Musicians use tuning forks to tune their instruments. A guitar player can play a note on her guitar. Then, she can compare that note with the note made by a tuning fork. If the note from the guitar sounds too high,
she can loosen the string. If the note sounds too low, she can tighten the string. Then, she can try it again.

Every tuning fork makes a specific pitch. For example, a tuning fork might vibrate at 440 hertz. That means the vibrating prongs go through a cycle of back-and-forth motion 440 times a second. Those vibrations make a note that musicians call “A.”

This kind of tuning fork is widely used. It makes the same pitch as one of the strings on a violin. It is used by musicians in orchestras to help them tune their instruments before they play.

Suppose you wanted a higher pitch. You would need to get a tuning fork with longer prongs. The longer the prongs, the higher the note. You might use a longer tuning fork that vibrated at 659 hertz. That would make a note that musicians call “E.”

Tuning forks also have other uses. Some ear doctors use them to check hearing. Here is how it works. The doctor asks her patient to listen for sounds. She then strikes a tuning fork where the patient can see her. She waits to see if the patient hears the tone. If the patient cannot hear the sound, that may mean there is a problem with the patient’s hearing.

Tuning forks are very useful tools.
1. What is the selection mainly about?
   A. Doctors use tuning forks to test hearing.
   B. Playing a guitar is difficult.
   C. Tuning forks are useful tools.
   D. Musical instruments have different pitches

2. What does the word **pure** mean in the following sentence from the selection?
   Tuning forks make a very **pure** kind of sound.
   A. mixed with other sounds
   B. not mixed with other sounds
   C. beautiful sounds
   D. not beautiful sounds

3. What determines the pitch of the sound a tuning fork makes?
   A. the speed of vibration
   B. the frequency of vibration
   C. the length of the prongs
   D. all of the above

4. Write **true** or **false** on the line following the sentence.
   The shorter the prongs on a tuning fork, the higher the pitch. ___________
5. What does the word **specific** mean in the following sentence from the selection?

Every tuning fork makes a **specific** pitch.

A. exact  
B. unknown  
C. varied  
D. unfamiliar

6. Why did the author write this selection?

A. to inform the reader about pitch  
B. to inform the reader about musical instruments  
C. to inform the reader about tuning forks  
D. to inform the reader about hearing loss

7. The selection mentions that a guitar player can use a tuning fork. What is another name for a person who plays the guitar, that includes the suffix –**ist**?

___________________________________

8. Draw a triangle around the adverb and a wiggly line under the verb. Write whether the adverb tells **how**, **when**, or **where** on the line following the sentence.

Dad set the hammer on the table there. ____________________
9. If someone is *famous* for something, what does that mean?

A. That person is full of a funny or amusing quality.
B. That person is full of something that is hard to understand.
C. That person is full of the state of being well-known.
D. That person is full of extreme anger or force

10. Draw a triangle around the adverb and a wiggly line under the verb. Write whether the adverb tells *how*, *when*, or *where* on the line following the sentence.

Sometimes I ride my bike to school. ________________
The Bell of Atri

The town of Atri, in Italy, was famous for its bell. The bell hung in the town square, where it had been placed many years before by an ancient king.

“If any man has been wronged,” the king proclaimed, “let him ring this bell and a judge will appear.”

The people of Atri made use of the bell. Whenever a man felt he had been wronged, he would ring the bell. Then, the judge would put on his robes and make his way to the town square to investigate.

A braided rope hung from the bell. After a while, this rope began to wear out. The braid broke apart into cords, and the cords themselves began to fray.

A farmer saw that the rope was about to give way. He cut grape vines from his vineyard and wrapped the vines around the fraying rope.

While the farmer was mending the rope, an old knight was limping out to his stable. In his youth, this knight had been an avid hunter. He had spent many days on his favorite horse, sounding the horn and chasing wild boars.

These, however, were the pleasures of the knight’s youth. As he grew older, he lost interest in hunting. He turned into a bitter, old miser. The old knight was so stingy that he barely fed the horse who had served him so well for many years. The poor animal stood all day in his stall, starving and neglected.

At last, the old knight decided to get rid of the horse.

“Why should I keep that old nag?” he said to himself. “It costs a
fortune to feed it, and I don’t even need a horse anymore.”

The old knight limped out to his stable. He threw open the stable door and drove the horse away.

“Get out!” he shouted. “Go and fend for yourself. I have no need for you anymore”

The old horse limped into town. The dogs barked at him and nipped at his heels as he went. At last, he came to the town square, where the Bell of Atri hung. The horse sniffed the rope. He smelled the grape leaves wrapped around the old rope and began to nibble on the vines. The bell began to swing from side to side.

Ding, dong! Ding, dong! Ding, dong!

The judge heard the bell. He put on his robes and walked to the town square. When he arrived, he found a horse standing beneath the bell and an angry crowd gathered around.

“What is the meaning of this?” the judge asked.

“That’s the old knight’s horse,” said a man in the crowd.

“Just look at him!” said another. “It looks like the poor beast hasn’t been fed in weeks.”

“The old miser never feeds him!” called another. “But look! The horse has rung the bell! He is calling for justice!”

“Justice for the horse!” shouted the crowd. “Justice! Justice!”

The judge sent for the old knight.

The knight did not pretend he was sorry for his actions.

“It’s my horse,” he said, with a sneer. “I can do what I want with him.
It doesn’t matter what the rest of you think.”

The knight turned to go but the judge stopped him.

“Sir Knight,” said the judge, “Shame on you! Where is your sense of honor? Have you forgotten the code of chivalry? This horse served you loyally for many years. How can you let him starve in his old age? You have done him wrong and I order you in the king’s name to right that wrong. Take care of this animal. Give him food and shelter. Let him live out his last days in peace!”

The old knight scowled but he did as he was told. The crowd cheered as he led the horse away.

When the king heard what had happened, he was pleased.

“Other bells call men to church,” he said. “But the Bell of Atri calls men to justice. We should be proud of this bell of ours, for it pleads the victim’s case—be he man or beast!”
11. What does the word **stingy** mean in the following sentence from the selection?

| The old knight was so **stingy** that he barely fed the horse who had served him so well for many years. |

A. mean and unkind  
B. unwilling to give or spend  
C. lacking food  
D. starving

12. What happened when someone rang the bell in Atri’s town square?

__________________________________________________________________________________

__________________________________________________________________________________

13. What might have happened if the farmer had not fixed the rope that hung from the bell?

__________________________________________________________________________________

__________________________________________________________________________________
14. Why wasn’t the old knight sorry for his actions regarding his horse?
   A. He felt he owned the horse and could treat it as he wished.
   B. He didn’t like the judge who ruled that he should take the horse home and care for him.
   C. He thought justice for a horse was silly.
   D. He was deaf and could not hear the bell.

15. What happened in the selection to show that the whole town approved of the judge’s ruling regarding the old knight’s horse?
   ______________________________________________________

16. Circle the true statement.
   A. The bell of Atri had been hung two years earlier.
   B. The bell of Atri hung in the judge’s front yard so he could hear it.
   C. The bell of Atri rang when someone pulled on its rope.
   D. The bell of Atri was only used by people.

17. Draw a triangle around the adverb and a wiggly line under the verb. Write whether the adverb tells how, when, or where on the line following the sentence.

   The girl screamed loudly. ______________________
18. Which of the following words would be on a dictionary page with the following guide words?

ballroom  

bingo

A. bell  
B. brush  
C. bunch  
D. baby

19. Write adjectives, adverbs, and synonyms in the appropriate boxes. Then write a new, more interesting sentence in the space provided using some of the words from the boxes.

<table>
<thead>
<tr>
<th>Adjectives to describe the child</th>
<th>Adverbs to describe how the child spoke</th>
<th>Adverbs to describe when the child spoke</th>
<th>Adverbs to describe where the child spoke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms for spoke</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Starter Sentence: The child spoke.

New Sentence: ________________________________________________________________
20. Circle the two words in the following sentences from the selection that have the suffix –er. Write their meanings on the lines.

While the farmer was mending the rope, an old knight was limping out of his stable. In his youth, this knight had been an avid hunter.

Word: __________
Meaning: ____________________________________________

Word: __________
Meaning: ____________________________________________
Hearing Aids

“Grandpa,” Ben said, “will you yell me a story?”

“What?” said Grandpa, cupping his hand to his ear.

“I said, will you tell me a story?”

“I’m sorry, Benjamin. You’ll have to repeat that. My hearing aid is not working.”

Ben repeated the question while Grandpa looked at him carefully, “Will you tell me a story?”

“Oh,” said Grandpa. “Sure thing. I’d be delighted to tell you a story. Just give me a minute. I have to change the battery in my hearing aid.”

Grandpa went to his room. When he came back a few minutes later, he had a tiny, silver battery in one hand and his pinkish hearing aid in the other. He showed Ben the battery. It was shiny and shaped like a cake. He showed Ben how to install the battery. Then, he slipped the hearing aid into his ear.

“Can you hear me now?” Ben asked.

“Yes,” said Grandpa. “Much better!”

“How does that thing work?” Ben asked.

“What thing?” Grandpa asked.

“Your hearing aid.”

“Oh, that! Well, let me see. How can I explain it? Have you ever seen a pop star singing at a concert?”
“Sure.”

“Well, then you know that the singer sings into a microphone. Then, her voice comes out of a big box called a speaker, but when it comes out, it’s much louder.”

Ben nodded.

“Well, my hearing aid works more or less the same way. It has a little microphone on the outside that listens for sounds. Then, it has another part that makes the sounds louder. That part is called an amplifier. Last but not least, it has a speaker that directs the amplified sounds into my ear canal.”

“Do all hearing aids run on batteries?”

“Yep,” said Grandpa. “The battery supplies power to make my hearing aid work.”

Ben sat thinking for a minute. He was making a connection to something he had learned in school earlier in the year.

“So, does that mean they did not have hearing aids back in history? Miss Tarbuck told us in class that they didn’t have any batteries back then.”

“That’s right,” said Grandpa. “They didn’t have batteries back then, so they didn’t have hearing aids like mine back then. But they did have a kind of hearing aid. But it didn’t run on batteries. It was called an ear trumpet.”

“An ear trumpet?”

“That’s right. An ear trumpet was a pipe that bent outward on both ends. You put one right up next to your ear. Then, you held the other end out to try to catch the sounds other people were making. The idea was that some of the sounds would go down the pipe and end up in your ear.”

“Did those ear trumpets work pretty well?”
“I’m not sure,” said Grandpa. “But I’m guessing they didn’t because nobody uses them anymore. Have you ever heard of the German composer Ludwig van Beethoven?”

“No.”

“Well, he went deaf late in life and had to use an ear trumpet.”

“So hearing aids with batteries are better than ear trumpets?”

“Definitely. But they’ve developed something recently which they say is even better. It’s called a cochlear implant. A cochlear implant is sort of like a hearing aid. But it’s not the sort of thing you can take out and put back in. It’s installed inside your head. A cochlear implant is like a really good hearing aid. It’s so good it can even help kids who are born deaf learn to hear!”

“Cool!” said Ben. “Can I get you a cochlear implant for your birthday?”

Grandpa chuckled.

“That’s awfully sweet of you,” he said. “But they are pretty expensive. Plus, you have to go to the hospital and have surgery done. For now, I’m okay with my hearing aid. It does have one advantage over a cochlear implant for me, you know.”

“What’s that?”

Grandpa bent down and explained, in a whisper: “Cochlear implants stay on all the time, but I can turn my hearing aid off. When loud sounds start to bother me, sometimes I do!”
21. Why did the author write this selection?
   A. to help the reader hear sounds from far away
   B. to instruct the reader about how to change batteries
   C. to sell the reader an ear trumpet
   D. to instruct the reader about hearing aids and cochlear implants

22. What does the word **amplified** mean in the following sentence from the selection?
   
   Last but not least, it has a speaker that directs the **amplified** sounds into my ear canal.

   A. louder
   B. softer
   C. higher
   D. lower

23. Circle the true statement.
   A. Beethoven was famous for inventing cochlear implants.
   B. Beethoven was a German composer who went deaf late in life.
   C. Beethoven used an eye trumpet to see better.
   D. Beethoven constructed batteries for hearing aids.
24. What would happen if Ben could buy a cochlear implant for Grandpa and Grandpa could have it implanted?
   A. Loud sounds would never bother Grandpa again.
   B. Grandpa would not need his old hearing aid.
   C. Grandpa would sell his old ear trumpet.
   D. Grandpa would buy batteries to make it work.

25. Why didn’t people back in history use hearing aids like the one Grandpa has?
   A. Hearing aids were too expensive back then.
   B. People back in history used cochlear implants.
   C. People back in history were not deaf.
   D. Those hearing aids had not been invented yet.

26. Write true or false on the blank following the sentence.

   Grandpa’s hearing aid includes a microphone and a speaker.____
27. Write adjectives, adverbs, and synonyms in the appropriate boxes. Then write a new, more interesting sentence in the space provided using some of the words from the boxes.

<table>
<thead>
<tr>
<th>Adjectives to describe the puppy</th>
<th>Adverbs to describe how the puppy slept</th>
<th>Adverbs to describe when the puppy slept</th>
<th>Adverbs to describe where the puppy slept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms for slept</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Starter Sentence: The puppy slept.

New Sentence: ________________________________________________________________

__________________________________________________________________________

28. Which of the following words would be on a dictionary page with the following guide words?

A. today  
B. toad  
C. topple  
D. together

29. If Grandpa acted humorously, what would he be doing?

__________________________________________________________________________
30. Write the letter ‘S’ over the subject and the letter ‘P’ over the predicate. Then, join the two simple sentences together using the conjunction *and* to write a compound sentence.

The motorcycle sped down the street. Other motorcycles followed close behind.

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________
Fluency Assessment

Pupils

“Class,” said Mr. Brown, “today we are going to learn some more about how our eyes work. James, would you please turn out the lights?”

James walked to the door and switched off the lights. Mr. Brown closed the blinds. It got darker in the classroom. It was not completely black. Some light came through the blinds, but not very much. The children giggled in the dimly-lit room.

“Now,” said Mr. Brown. “I’d like all twenty-two of you to turn and look at the person who sits next to you. Sally, you look at Mick. Jen, you look at Stan. That’s it! Lean close and look your partner right in the eyes. Can you see your partner’s pupils? Remember: the pupil is the black part in the center of the eye. It’s the part that lets in light from the outside world.”

Mr. Brown walked over to the door. “Can you all see your partner’s pupils?”

“Yes!” said the students.

“Keep looking at your partner’s pupils!” said Mr. Brown. Then, he turned on the lights. In an instant, the room went from dim to bright.

Sally was staring at Mick’s pupils. She watched them shrink.
“Cool!” she called out. “Mick’s pupils got smaller when you turned on the lights!”

“Sally’s did, too!” said Mick.

All around the room, students noticed the same thing. When the lights came on, their partner’s pupils got smaller.

Mr. Brown explained: “The pupil’s job is to let light into the eye and to keep it out. If it’s dark, your pupil opens wide to let in a lot of light. If it’s bright, your pupil shrinks to let in less light. This is a reflex. You don’t have to think, I believe I shall open my pupil a bit wider. Your pupils work all by themselves, without you even thinking about it. The pupil is like the gatekeeper of the eye. It decides what gets in and what has to stay out.”

“Do it again!” shouted Mick. “Shut off the lights!”

“Okay,” said Mr. Brown. “Keep your eyes on your partner’s pupils.”

He threw the switch. Forty-four pupils grew larger in the dimness.

Mr. Brown waited a few seconds. Then, he turned the lights back on. Forty-four pupils shrunk in the bright light.

“So,” said Mr. Brown. “Do we understand what the pupils do?”

The students nodded their heads in agreement.
**W.C.P.M. Calculation Worksheet**

Student: ___________________________  Date: ___________________________

Story: *Pupils*

Total words: 400

<table>
<thead>
<tr>
<th>Words Read</th>
<th>Words Correct</th>
<th>Uncorrected Mistakes</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seconds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Finish Time - Start Time = Elapsed Time

Words Correct $\times 60 = \text{Time in Seconds}$

$$\text{W.C.P.M.} = \frac{\text{Words Correct}}{\text{Time in Seconds}} \times 60$$

Compare the student’s W.C.P.M. score to national norms for Winter of Grade 3 (Hasbrouck and Tindal, 2006):

<table>
<thead>
<tr>
<th>W.C.P.M</th>
<th>National Percentiles for Winter, Grade 3</th>
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<tr>
<td>146</td>
<td>90th</td>
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<tr>
<td>120</td>
<td>75th</td>
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<td>92</td>
<td>50th</td>
</tr>
<tr>
<td>62</td>
<td>25th</td>
</tr>
<tr>
<td>36</td>
<td>10th</td>
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</tbody>
</table>

**Comprehension Total** ___ / 6

<table>
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<tr>
<th>Answers Correct</th>
<th>Level</th>
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<tbody>
<tr>
<td>6</td>
<td>Independent comprehension level</td>
</tr>
<tr>
<td>4-5</td>
<td>Instructional comprehension level</td>
</tr>
<tr>
<td>2-3</td>
<td>Frustration comprehension level</td>
</tr>
<tr>
<td>0-1</td>
<td>Intensive remediation warranted for this student</td>
</tr>
</tbody>
</table>
Conjunction *but*

Create compound sentences by connecting the two simple sentences with the conjunction *but*. Draw two lines under the conjunction and label the subject(s) with the letter ‘S’ and the predicate(s) with the letter ‘P’.

1. Brownies are fun to make. They are sometimes hard to get out of the pan.

   ____________________________________________
   ____________________________________________

2. The day is rainy and dreary. The sky is brightening off in the distance.

   ____________________________________________
   ____________________________________________

3. My new puppy is very naughty. I love her so much.

   ____________________________________________
   ____________________________________________

4. This math homework seems very hard. I’m going to keep trying.

   ____________________________________________
   ____________________________________________
5. We knocked on the door. No one was at home.

__________________________________________________________________________________

__________________________________________________________________________________

Create the second part of a compound sentence using the conjunction *but*.

6. Denise likes pepperoni pizza, but

__________________________________________________________________________________

__________________________________________________________________________________

(Hint: think about a family member who likes a different topping better)

7. Linda loved the movie she just saw, but

__________________________________________________________________________________

__________________________________________________________________________________

(Hint: think about a friend who went to the movie with her who had a different idea about the movie)
Spelling Assessment

As your teacher calls out the words, write them under the correct header.

‘a’ > /æ/  ‘a_e’ > /æ/

________________________  ________________________
________________________  ________________________
________________________  ________________________
________________________  ________________________
________________________  ________________________
________________________  ________________________
________________________  ________________________
________________________  ________________________
________________________  ________________________
________________________  ________________________

Challenge Word: ____________  Challenge Word: ____________

Content Word: _______________

Name: ______________________

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Dictated Sentences:

1. ______________________________________________________________

   ________________________________________________________________.

2. ______________________________________________________________

   ________________________________________________________________.
Light and Photography

1. What does the word *photography* mean?

__________________________________________________________________________________
__________________________________________________________________________________

Page ____

2. Describe a pinhole camera.

__________________________________________________________________________________
__________________________________________________________________________________

__________________________________________________________________________________

Page ____

3. Louis Daguerre developed daguerreotypes that used ________________ to make an image on a glass plate.
   Page ____

4. George Eastman invented ________________ that replaced the glass plates used in earlier cameras.
   Page ____

5. The invention of ________________ led to the creation of the box camera.
   Page ____
6. Describe how you would get your photos using a box camera.
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Page ______

7. Why were instant film cameras so popular?
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Page ______

8. Today’s digital cameras don’t use film but rather a ________________________________ .

Page ______

9. Write the main idea of this chapter.
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
Light and Photography

The word *photography* comes from two Greek words. *Photo* means “light” and *graphein* means “to draw.” So you might say that *photography* means “to draw with light.”

The earliest ideas for making pictures using light came in the 4th century BC from a Greek man named *Aristotle*. He observed and made notes about how light acts.

The first person to put *Aristotle’s* ideas into practice was an Arab scientist, Alhazen, around 1000 AD. He made the first pinhole camera. It was a box with a small hole in one side. Light from the outside came through this little hole and projected an image on the opposite side of the box. Alhazen used it to help him draw. His camera did not take *photographs* as we know them today. Others continued to experiment with and improve pinhole cameras. Even today, some people still enjoy making their own simple pinhole cameras.

The first thing similar to a *photograph* was made in 1826 by a Frenchman named Joseph Niepce [NEEP-see]. He *invented* what were called *heliographs*. *Helio* is the root for “sun.” He used sunlight to create images. The sunlight mixed with a form of coal and some other natural chemicals on a square, glass plate to make an image. It took eight hours in the sunlight before the image appeared! Then, it faded.

Another Frenchman named Louis Daguerre [Dœ-GAIR] took Niepce’s ideas and improved them. He was able to use light to create an image in less than thirty minutes. His images were called *daguerreotypes*, named for their *inventor*. *Daguerreotypes* used light-sensitive chemicals like silver and iodine to make an image on a metal plate. These became popular around the world.
The late 1800s brought even more improvements to photography thanks to some very creative inventors. One such inventor was the American George Eastman. In 1888, he invented flexible, rolled film that could replace the glass plates that were used in earlier cameras.

The invention of film led to the creation of the box camera, which was a tight box with a simple lens. The camera had film that could take as many as 100 photos. People could take photos and then send the camera back to Eastman’s company to print the photos. The company then sent both the photos and camera back to you. Ask to see your family’s older photo album. Chances are that some of the much older photos may have been taken with a box camera.

Color films were not invented until the late 1930s and early 1940s. By then, most families owned at least one camera and photo albums became a common, household item.

Cameras improved at a fast rate around the 1950s. Instant photography was invented by Edwin Land, who sold his first camera in 1948. With his camera, one minute after you took the photo, you would have a fully developed photograph from the camera. These cameras were popular because people did not have to wait to get their photos. They had them right after they shot the photo with their camera.

Chances are that if you or your family has a camera now, it is a digital camera. Digital cameras do not use film like the early cameras described previously. Digital cameras have a special computer “chip” that takes the place of film. In fact, many cell phones now also have digital cameras. Imagine how amazed the early inventors would be to see all of the cameras we have today!
Alexander Graham Bell, Part I

1. What did Aleck explore when he lived outside Edinburgh?

__________________________________________________________________________________
__________________________________________________________________________________

Page _____

2. How was Aleck’s mother able to hear the music she played?

__________________________________________________________________________________
__________________________________________________________________________________

Page _____

3. Describe the Visible Speech Aleck’s father invented.

__________________________________________________________________________________
__________________________________________________________________________________

Page _____

4. What motivated Aleck’s father to invent Visible Speech?

__________________________________________________________________________________
__________________________________________________________________________________

Page _____
5. What characteristics did Aleck’s parents have that served as an inspiration for him?

__________________________________________________________________________________
__________________________________________________________________________________

6. Write the main idea of this chapter.

__________________________________________________________________________________
__________________________________________________________________________________
Alexander Graham Bell, Part I

What makes someone famous? Who would you think of if you were asked to name someone famous today? Would you name a famous athlete? An actor or musician? Maybe you would think of a president or famous leader. One of the most famous inventors of all time lived over 100 years ago. His name was Alexander Graham Bell.

Alexander Bell was born March 3, 1847. He was the middle of three sons born to Alexander and Eliza Bell of Edinburgh, Scotland. His parents nicknamed him “Aleck” as a young boy. Aleck’s childhood was happy. He lived the best of both worlds by spending time at his home in the city of Edinburgh and also in the country on the weekends. More than anything, Aleck loved to learn new things.

At Milton Cottage near Edinburgh, young Aleck enjoyed exploring nature. He collected plants and studied animals.

In school, Aleck’s best subjects were science and music, which he learned from his mother. Aleck’s mother was nearly deaf, so she played music mostly by feel. To hear the music, she would put a hearing trumpet to the strings of the instrument. The trumpet magnified the sound.

Aleck’s father was an important speech professor. He studied the sounds of the English language, similar to the phonics you studied to learn to read. He very much wanted to help his wife, Eliza, and other deaf people. In 1864, he invented a “sound alphabet” called Visible Speech. He spent years coming up with symbols to stand for any sound the human voice could make. The symbols that he used looked the way a person’s mouth looked when making certain sounds. Visible Speech helped deaf
people learn how to talk better so that they could communicate with others.

The example of both his mother and father was an inspiration for Aleck. He became interested in inventing things on his own. He especially wanted to invent things to help other people. Aleck and his brother actually made a “speaking machine.” The machine used the voice box (larynx) of a dead sheep. Part of the machine acted like a mouth and throat and could say the word “mama.”

As an adult, Aleck worked with deaf students. He later took a job as a professor at Boston University. Inventing things was a big part of Aleck’s life. After one invention, he set his mind on others, never satisfied with the past invention. The invention that he is most famous for, however, was yet to come.
Alexander Graham Bell, Part II

1. What is a telegraph?
   A. A telegraph is a machine that allows people to send dots and dashes across wires.
   B. A telegraph is a machine that allows people to hear each others’ words across wires.
   C. A telegraph is a way to record voices so people can hear each other.
   D. A telegraph is a way to record written words so people can communicate with each other.

2. Why was the Massachusetts Institute of Technology so important to Aleck Bell?

   __________________________________________________________

   __________________________________________________________

   __________________________________________________________

   __________________________________________________________

   Page _____

3. Aleck Bell said that electric current could be used to carry sound. Why do you think that people thought he was crazy?

   __________________________________________________________

   __________________________________________________________

   __________________________________________________________

   __________________________________________________________

   Page _____
4. Describe how an accident led to the invention of the first telephone.

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

Page _____

5. Alexander Graham Bell felt that “self-education is a life-long affair.” What does that mean to you as a student who is learning new things every day?

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

Page _____
Alexander Graham Bell, Part II

Aleck Bell loved thinking of new things to invent more than anything else in the world, especially to help other people. In 1837, another inventor, Samuel Morse, created a machine called the telegraph. The telegraph was a way to send messages long distances across wires. It was limited to dots and dashes and could not transmit human sounds. Aleck began to think about ways that he might improve upon this new invention. “I used to tell my friends that one day we should speak by telegraph,” said Bell. He devoted all his time to this new goal. So did many others and the race for a new invention was on.

Boston, Massachusetts became an important place for many inventors. The Massachusetts Institute of Technology (MIT) made space in one of its labs for Aleck to do his experiments. His days were filled with teaching and then trying over and over to make human sound travel across a wire. All of his energy was spent on this creative idea. He wrote that his idea of using electric current to carry a sound would likely make others think him “crazy.” So, he kept most of his ideas and experiments secret.

Aleck hired a young mechanic to help him. Thomas Watson knew how electricity worked. At first, their experiments failed more than they succeeded. Aleck thought they were getting closer to success. “I think the transmission of the human voice is much more nearly at hand than I thought.” On June 2, 1875, his dreams came true.

Like many inventions, an accident led to an important discovery. With the electricity turned off, Watson sent a message to Aleck that Aleck could hear. He heard tones, not just one single-pitched sound. He knew instantly
it was a huge step forward! “I have (by accident) made a discovery of the very greatest importance,” wrote Bell.

Three days later, the first telephone recorded, “Mr. Watson, come here, I want to see you.” To Bell’s great joy, Watson had heard and understood what Bell had said!

Fame and fortune came to Alexander Graham Bell and Thomas Watson. They soon formed the Bell Telephone Company to make and sell their new invention.

Bell continued to invent the rest of his life. “Self-education is a lifelong affair,” said Bell. “There is no failed experiment,” he said to convince people to keep going with their ideas. He passed his love of learning on to his grandchildren and inspired a whole group of new inventors.
Thomas Edison: The Wizard of Menlo Park

1. According to the selection which of the following is true?
   
   A. Thomas Edison is in the “Hall of Fame.”
   
   B. Thomas Edison’s teachers did not like him.
   
   C. Thomas Edison worked on telegraph machines.
   
   D. Thomas Edison liked to work with telescopes.

2. Read the following from the selection:

   At the age of 12, he *worked* selling newspapers on the railroad near his home.

   Replacing the –*ed* with –*er* in *worked* makes a new word. Write the new word in the blank and then choose the best meaning.

   _______________________________________________________________________

   A. someone who works
   
   B. full of work
   
   C. without work
   
   D. someone who sells things
3. What does the author want you to know about Thomas Edison?
   A. He kept trying even when things went badly.
   B. He gave up easily.
   C. He liked the color blue in the sky.
   D. He wanted to learn how to make fire.

4. For what invention is Edison best known?
   A. phonograph
   B. light bulb
   C. microphone
   D. iPod

5. Write the main idea for this chapter.

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

__________________________________________________________________________________
Thomas Edison: The Wizard of Menlo Park

Have you figured out why inventors are so important? They have helped every person’s life in one way or another. Shouldn’t there be an inventors’ “Hall of Fame?” If there were, then a man named Thomas Alva Edison would be quickly voted in.

Thomas Alva Edison was born February 11, 1847, in a small, northern Ohio town. He was the last of seven children born to Sam and Nancy Edison. Al, the nickname his friends gave him, was a sickly child. He didn’t even attend school until he was eight years old. Because of scarlet fever as a child, Al was left more than partially deaf. His illnesses did not stop his interest in nature. He asked questions that teachers didn’t know how to answer: “Why is the sky blue?” or “How does fire work?” He was curious about everything and liked to figure out things on his own.

At the age of 12, he worked selling newspapers on the railroad near his home. On the train, he heard people talking about many new ideas and inventions. He learned by listening to their stories. At 15, Al landed a job working the telegraph machine. He became an expert telegraph operator over the next six years. Even though he was deaf, he could feel the vibration of the wire.

Al liked to work with electric machines. He found a way to make the telegraph faster and sold the idea to Western Union Telegraph Company for $40,000. With the money he made from the sale, he set up his first lab to continue his experiments.

When the work Al was doing outgrew this lab, he built a bigger lab in Menlo Park, New Jersey. He hired some of the smartest scientists and
engineers from around the world to work with him. Much of his early work was on sound. They called him the Wizard of Menlo Park because some of the inventions seemed magical.

In this new lab, he discovered a way to make Alexander Graham Bell’s new telephone louder. He sold the *patent* for his new invention for $100,000. That was a huge sum of money at the time.

His next invention was the *phonograph*. He was able to record sound on a cylinder wrapped in tinfoil. He played a version of “Mary Had a Little Lamb” to his fellow scientists. This was the first time anyone was able to listen to recorded music.

The invention that Edison is best known for came next. In 1879, he invented the first *incandescent* (glowing) electric light bulb. Three years later, he lit up 85 homes at once in New York City and the age of electric light began.

By the time Edison “retired,” he had *patents* on over 1,000 inventions. They include the *kinetoscope*, which is a machine for showing movies, and the *microphone*.

What people sometimes forget is that many of Edison’s experiments “failed” at first. He caused explosions at his labs and was forced to start all over many times. However, he kept moving forward each time. He always had a positive attitude. He knew he was closer to his next success!
Adverbs that Tell how

Write an adverb to describe the verb in the sentence. Do not use the same adverb more than once.

We ran quickly to the car when the storm started.
Adverb: quickly  Verb described by adverb: ran

1. The referee blew his whistle ____________ after the play.
   Adverb: ____________  Verb described by adverb: ____________

2. Our dog ____________ sits in the doorway at night.
   Adverb: ____________  Verb described by adverb: ____________

3. He searched ____________ for his math homework.
   Adverb: ____________  Verb described by adverb: ____________

4. We walked ____________ into the kitchen for dinner.
   Adverb: ____________  Verb described by adverb: ____________

5. The posters on the wall were placed ________________
   Adverb: ____________  Verb described by adverb: _____________
Change the adjective under the blank to an adverb by adding –ly to complete the sentence. Answer the question after the sentence.

1. The storm ______________________ damaged the car.
   (bad)
   How was the car damaged? _______________________

2. The big baseball uniform hung ______________________ on Devon.
   (loose)
   How did the baseball uniform hang? _______________________

3. Dad ______________________ clapped when I scored a goal.
   (proud)
   How did Dad clap? _______________________

4. The music played ______________________ through the speakers.
   (loud)
   How did the music play? _______________________

5. She ______________________ walked into her new classroom.
   (shy)
   How did she walk? _______________________

Adverbs that Tell when and where

Choose the adverb that best fits in each blank and write it in.

<table>
<thead>
<tr>
<th>weekly</th>
<th>always</th>
<th>last</th>
<th>after</th>
<th>sometimes</th>
</tr>
</thead>
</table>

We visit my grandfather ____________.
We ____________ go on Sunday afternoon. I like to bring books ____________ and read them to him. When I do bring books, he asks me to read my favorite book ____________. He knows I will be excited about it and read it well at the end. ____________ I read my books to him, we have dinner.

Write a sentence using each adverb.

1. recently

   ____________________________________________________________________________________

   ____________________________________________________________________________________

2. tomorrow

   ____________________________________________________________________________________

   ____________________________________________________________________________________
Choose the adverb that best fits in each blank and write it in.

| here | already | home | outside |

My brother and I ran ____________ to look for our friends. We did not see anyone so we walked _____________. When we got ____________ we saw a note on the door. It was from David and said “Meet at my house, and we’ll go to the park together!” We got to David’s house and another note said he had ____________ gone to the park. We found him at the park and played until it got dark!

Write a sentence using each adverb.

1. *never*

__________________________________________________________________________________
__________________________________________________________________________________

2. *inside*

__________________________________________________________________________________
__________________________________________________________________________________
Conjunction *and*

Write the letter ‘S’ over the subjects and the letter ‘P’ over the predicates in each simple sentence. Draw a line to separate the subject and predicate in each simple sentence. Then, join the two simple sentences together using the conjunction *and* to make a compound sentence. Draw two lines under the word *and* to show that it is a conjunction.

```
S      P      S      P
Example: Carla | sings a song. Connie | dances a jig.
Carla sings a song, and Connie dances a jig.
```

1. Matthew loves basketball. Tina enjoys tennis.

2. The bucket is rusty. It leaks on my foot.

3. The silly kitten paws at the string. He plays joyfully!
4. The dentist uses a mirror to check my teeth. She is very gentle with me.

________________________________________________________________________________
________________________________________________________________________________
________________________________________________________________________________

Challenge: Mark the subject(s) and predicate(s) and underline the conjunction and with two lines in the following sentences. Write ‘Yes’ on the line if the sentence is a compound sentence with two independent clauses and ‘No’ if it is not a compound sentence.

Example: Tom fixed breakfast and dinner for his family. ______ No ______

1. Lindsay and Tony walked to the library. _______________

2. Linda jumped rope and played soccer yesterday. _______________

3. Tina chose the movie and Jeff picked out the candy. _______________
Conjunction *and*

Write the letter ‘S’ over the subjects and the letter ‘P’ over the predicates in each simple sentence. Draw a line to separate the subject and predicate in each simple sentence. Then, join the two simple sentences together using the conjunction *and* to make a compound sentence. Draw two lines under the word *and* to show that it is a conjunction.

```
S     P   S     P
Example: The straw | is broken. I | can’t drink out of it.

The straw is broken, and I can’t drink out of it.
```

1. The beavers are playful. Their babies splash around in the lake.

2. We watched the beavers. We took pictures of them.

3. The white clouds float across the sky. They make me feel good.
4. Clouds are beautiful. The whole class loves to watch them.

☐ ☐ ☐ ☐ ☐

Challenge: Mark the subject(s) and predicate(s) and underline the conjunction and with two lines in the following sentences. Write ‘Yes’ on the line if the sentence is a compound sentence with two independent clauses and ‘No’ if it is not a compound sentence.

Example: Steve | wore a coat and gloves. _______ No

1. Emma and Ryan visited the zoo. _____________

2. Amy painted a picture and read a book on Saturday. _____________

3. Kate washed the dishes and Sam cleaned the sink. _____________
Conjunction *but*

Create compound sentences by connecting the two simple sentences with the conjunction *but*. Draw two lines under the conjunction and label the subjects with the letter ‘S’ and the predicates with the letter ‘P’.

1. Marshmallows are fun to melt. They can make a mess.

2. The day is sunny and beautiful. The sky is getting dark off in the distance.

3. My new kitten is very naughty. I laugh at her so often.

4. This grammar homework seems very easy tonight. I’m going to do my best and not hurry.
5. The salesman knocked on our door. We were out of town.

__________________________________________________________________________________

__________________________________________________________________________________

Create the second part of a compound sentence using the conjunction but.

1. David likes peanut butter and jelly sandwiches, but

__________________________________________________________________________________

__________________________________________________________________________________

(Hint: Think about a family member who likes a different kind of sandwich.)

2. Lulu loved the book she just read, but

__________________________________________________________________________________

__________________________________________________________________________________

(Hint: Think about a friend who read the same book but who had a different idea about it.)
**Suffix Review: –er, –or, –ist, and –ian**

This chart lists words with some of the suffixes studied in Grade 3. Some of these words are new to you. Use the chart to fill out Worksheet PP15.

<table>
<thead>
<tr>
<th></th>
<th>–er</th>
<th>–or</th>
<th>–ist</th>
<th>–ian</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td></td>
<td>actor</td>
<td>artist</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>builder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>climber</td>
<td>counselor</td>
<td>cellist</td>
<td>cosmetician</td>
</tr>
<tr>
<td>d</td>
<td>designer</td>
<td>dictator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>editor</td>
<td></td>
<td></td>
<td>electrician</td>
</tr>
<tr>
<td>f</td>
<td>farmer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g</td>
<td>governor</td>
<td>guitarist</td>
<td>guardian</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>hunter</td>
<td></td>
<td></td>
<td>historian</td>
</tr>
<tr>
<td>i</td>
<td>inspector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>l</td>
<td>leader</td>
<td>lyricist</td>
<td>librarian</td>
<td></td>
</tr>
<tr>
<td>m</td>
<td></td>
<td></td>
<td>musician</td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>navigator</td>
<td>novelist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o</td>
<td></td>
<td>organist</td>
<td>optician</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>player</td>
<td>pianist</td>
<td>pediatrician</td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>reporter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>s</td>
<td>speaker</td>
<td>sailor</td>
<td>stylist</td>
<td></td>
</tr>
<tr>
<td>t</td>
<td>teacher</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>v</td>
<td></td>
<td>visitor</td>
<td>vocalist</td>
<td></td>
</tr>
</tbody>
</table>
Use the chart on Worksheet PP14 to fill in the blanks.

1. Which words on the chart are people who play musical instruments?
   __________________________
   __________________________
   __________________________
   __________________________

2. Which word on the chart is what Julius Caesar had himself appointed for life?
   __________________________

3. Which word on the chart names someone who can help you pick out books at the library?
   __________________________

4. Which words on the chart name people that might work together while they are on a boat?
   __________________________
   __________________________

5. Which word on the chart names someone who writes lyrics, or words to songs, for a vocalist to sing?
   __________________________

6. Which words on the chart name people who might work together to build a house?
   __________________________
   __________________________
   __________________________

7. Which word on the chart names someone that every team needs as someone to guide, or lead them?
   __________________________
8. Which words on the chart name people who might work at a school?
___________________________  __________________________  __________________________

9. Which words on the chart name people who do things outside?
___________________________  __________________________  __________________________
 __________________________  __________________________  __________________________

10. Which words on the chart name people who might work together to help someone look his or her best?
___________________________  __________________________  __________________________

BONUS:

11. Alphabetize the words that begin with ‘c’.
___________________________
 __________________________
 __________________________
 __________________________

12. Count the number of words on the chart for each suffix and write the number here. Circle the suffix that has the most words.
Words with Suffixes –y and –al

Add the correct suffix to the root word provided. Write the new word in a sentence.

1. Root word: nutrition
   Add –y or –al to make: _________________
   __________________________________________

2. Root word: leak
   Add –y or –al to make: _________________
   __________________________________________

3. Root word: curl
   Add –y or –al to make: _________________
   __________________________________________

4. Root word: tradition
   Add –y or –al to make: _________________
   __________________________________________

5. Root word: music
   Add –y or –al to make: _________________
   __________________________________________
Circle the word that matches the meaning.

1. Meaning: full of soil
   Word: dirty dirt

2. Meaning: the traditions, beliefs, and arts of a group of people
   Word: culture cultural

3. Meaning: something that is untidy and dirty
   Word: mess messy

4. Meaning: a power that allows people to do impossible things by saying special words or performing special actions
   Word: magical magic

5. Meaning: full of a reddish brown substance that forms on certain metals when they are exposed to moisture
   Word: rusty rust

6. Meaning: related to the land near the sea or ocean
   Word: coast coastal
Practice Using Suffixes –ous and –ly

Choose the correct word to complete each sentence. Write the word and its part of speech below the sentence.

1. The mayor ______ denied he did anything wrong but an investigation proved otherwise.
   Word: ______________ Part of Speech: _______________

2. Marcus drew a ______ representation of the animal he wrote about for his report.
   Word: ______________ Part of Speech: _______________

3. The road curved ______ when you got near the top of the mountain.
   Word: ______________ Part of Speech: _______________

4. I heard a ______ sound coming from the somewhere by the window but I couldn’t figure out what it was.
   Word: ______________ Part of Speech: _______________

5. The crew who worked to clean up hazardous materials kept the ______ items in a special container when they collected them.
   Word: ______________ Part of Speech: _______________

6. The passenger ______ ran through the terminal, upset that the security line had been so long and worried he would miss his flight.
   Word: ______________ Part of Speech: _______________
7. The class responded _________ when they found out they had won the attendance prize for the month.
   Word: _______________ Part of Speech: _______________

8. If you are outside and have no shelter when a thunderstorm hits, you are in a _________ situation.
   Word: _______________ Part of Speech: _______________

Bonus: Circle the correct answer and write the part of speech

1. Which of the following words means “full of danger and excitement”?
   adventurously    adventure
   Part of Speech: ___________________________________

2. Which of the following words means “in a courteous way”?
   courteously    courteous
   Part of Speech: ___________________________________

3. Which of the following words means “full of the feeling of wanting what someone else has”?
   envious    enviously
   Part of Speech: ___________________________________
Practice Dictionary Skills

Use the following portion of a dictionary page to answer the questions below.

<table>
<thead>
<tr>
<th>preschool</th>
<th>prod</th>
</tr>
</thead>
<tbody>
<tr>
<td>present</td>
<td>1. <em>verb</em> To give a gift. 2. <em>verb</em> To introduce a person. 3. <em>adjective</em> To be in a place.</td>
</tr>
<tr>
<td>private</td>
<td>1. <em>noun</em> A soldier of a low rank. 2. <em>adjective</em> Not for sharing. 3. <em>adjective</em> Belonging to one person and no one else.</td>
</tr>
</tbody>
</table>

1. What are the two guide words on the page?

2. What are the two entry words on the page?

3. Would the word *presentation* be on this page?

4. Circle the word(s) that would come before the word *preschool* in the following list: presently, prescribe, prepare

5. Which definition of *present* matches the use of the word in the sentence:
   May I *present* the governor of our state? _______________
   What part of speech is *present* in this sentence? _______________
6. Which definition of *present* matches the use of the word in the sentence:
   Every student is *present* today. ______________
   What part of speech is *present* in this sentence? ______________

7. Write a sentence using the definition of *present* not already used in the
   sentences above. ______________________________________
   ________________________________________________________

8. Which definition of *private* matches the use of the word in the sentence:
   My diary is *private* property and should not be read by anyone else.
   ______________
   What part of speech is *private* in this sentence? ______________

9. Which definition of *private* matches the use of the word in the sentence:
   The *private* saluted the general when he walked by. ______________
   What part of speech is *private* in this sentence? ______________

10. Write a sentence using the definition of *private* not already used in the
    sentences above.
    _________________________________________________________
    _______________________________________________________
Glossary for *Adventures in Light and Sound*

**A**

**absorb**—to take in or soak up (*absorbed*)

**angle**—the space formed when two lines or surfaces meet

**Aristotle**—a Greek philosopher who made notes about how light acts; His notes later helped inventors make cameras.

**automatically**—operating on its own without direct control

**C**

**camera**—an instrument for taking photographs (*cameras*)

**concave**—curved inward, like a spoon

**convex**—curved outward

**curve**—to bend (*curved, curves*)

**D**

**daguerreotype**—a type of early photograph invented by Daguerre; It appeared in less than 30 minutes and did not disappear as quickly as a heliograph. (*daguerreotypes*)

**damage**—hurt, harm

**dense**—thick, heavy (*denser*)
discovery—an event in which someone finds or learns something for the first time
distort—to twist out of normal shape (distorted)

electric current—the flow of electricity
electricity—energy carried over wires (electric)
energy—a supply of power

hearing trumpet—a cone-shaped tool that helps a person hear better by placing the small end in one ear

heliograph—a type of early photograph made by mixing coal and other natural elements that are then left in the sun to make the images; They took a long time to appear and disappeared quickly. (heliographs)

incandescent—glowing
indigo—a dark purplish-blue color
infrared—long light waves, beyond red on the spectrum, that can only be seen with special instruments
inspiration—something that gives a person an idea about what to do or create
intense—strong (intensity)
invent—to make something new that no one else has ever made (invented, inventor, inventors, invention)

K

kaleidoscope—a tube with plane mirrors and pieces of colored glass that you hold up to the light and rotate to make colorful patterns

kinetoscope—an early machine for showing movies

L

larynx—the organ in your throat that holds the vocal cords and makes it possible to speak; voice box

lens—a clear piece of curved glass or plastic that is used to make things look clearer, larger, or smaller (lenses)

lung—one of a pair of organs that allows animals to breathe by filling with air (lungs)

M

magnify—to make something look larger or sound louder (magnified, magnifies)

magnifying glass—a convex lens that makes things look larger when they are held close to the lens

material—cloth or fabric

medium—a substance that light or sound can travel through, like a solid, a liquid, or a gas ( mediums)

microphone—an instrument for recording sound or making sound louder
mirror—a shiny surface that reflects light (mirrors)

Morse Code—a way of communicating with dots and dashes using the telegraph

O

opaque—not clear, blocking all light so that none gets through

P

patent—the rights to make and sell something (patents)

phonograph—an instrument that reproduces sounds that have been recorded on a grooved disk

photograph—a picture made with a camera (photography, photographs, photos, photo)

pitch—how high or low a sound is (pitched)

plane—a more or less flat surface

prism—a wedge-shaped piece of transparent glass that breaks up light into all the colors of the spectrum

professor—a college teacher

project—to cause light to appear on a surface (projected, projector)
R

reflect—to throw back light, heat, or sound from a surface (reflections, reflects, reflected, reflection)

refract—the appearance of light bending when it moves from one medium to another (refraction, refracting, refracts)

remote control—a device that uses infrared waves to operate equipment, such as a TV, from a distance

S

scarlet fever—a disease that causes a fever, sore throat, and a red rash

security—protection from danger

shadow—a dark shape or outline of something that is made when light is blocked (shadows)

silvery—shiny or silver in color

skylight—a window in a ceiling or roof that lets in light

sound wave—a series of vibrations that can be heard (sound waves)

source—a starting place, where something comes from (sources)

spectrum—the distribution of all the colors that make up the light we see

speed—how fast or slow something moves

surface—the outside layer of something

symbol—an object or picture that stands for something (symbols)
telegraph—a tool for communicating by sending electrical signals by wire or radio

trachea—a tube that air passes through going to and from the lungs; windpipe

transmit—to move or send something from one place to another (transmission)

transparent—clear, see-through so light gets through

ultraviolet—short, invisible light waves, beyond violet on the spectrum, that cause sunburn

vacuum—emptiness

Visible Speech—a system of communication used by deaf people in which symbols represent sounds

vocal cords—muscles that produce sound when air passes over them

volume—the loudness or intensity of a sound

wave—an amount of energy that moves in a rippling pattern like a wave (waves)

wavelength—how long a wave is, the distance from the top of one wave to the top of the next wave (wavelengths)

white light—light that is made up of waves with different wavelengths and includes all the colors we can see
Writing Prompts

Unit 5:
1. Write instructions for taking a picture with a digital camera and sending it to a friend.
2. Research Thomas Edison and write a paragraph about the phonograph that he invented.
3. Explain how your eyes see color.
4. Make a graphic organizer to help you organize facts about Alexander Graham Bell.
5. Research a periscope and write a paragraph describing how one works. Remember to include facts about mirrors.
6. Read about kaleidoscopes and write a description about how they work.

Either fiction or nonfiction:
1. Summarize the story or chapter you read in three to five sentences.
2. After reading this story or chapter, I wonder...
3. Name three things you liked about the story or chapter.
4. Make a timeline of three to five events in your reading today.
5. Pretend you are a TV reporter who has to interview the main character or person in the story or chapter you read, and write down five questions you would ask.
6. Make a prediction about what will happen next in the story or chapter you just read. Explain why you think this will happen.
7. Pretend you are the main character or a person in the story or chapter you read today and write a diary entry for that person.
8. Describe something in the story or chapter you read today that is similar to something you have already read.
9. Draw a Venn diagram to show what is alike and/or different between two characters or people in the story or chapter you read.
10. How does the title fit the story or chapter? Suggest another title.
11. Write down three new words you learned while reading and tell what they mean. Use each word in a new sentence.

12. Name three questions you would ask the author of the story or chapter.

Fiction:
1. Tell about the setting.
2. Tell about the plot.
3. Tell about your favorite character. Write three reasons why you chose that character.
4. Which character is your least favorite? Write three reasons why you chose that character.
5. Give examples of personification from the story.
6. Draw a line down the center of your paper. On one side write the title of your favorite story. On the other side write the title of whatever you read today. Compare and contrast the main characters, the settings, and the plots.
7. Write a different ending for the story.
8. If you could be any character in the story or chapter you read today, who would you be? Give three reasons why.
9. Invent a conversation or dialogue between two characters or people in the story or chapter that you read. Write what each character says and don’t forget to use quotation marks.
10. Describe a character, setting, or plot that surprised you. Explain what it was and why it surprised you.
11. Tell about a problem that someone in the story or chapter had and what he or she did about it.

Nonfiction:
1. Describe something that you learned from what you read today.
2. Write at least three questions you have after reading the chapter about the topic in the chapter.
3. In three sentences, summarize what you read today.
# Conference Record For Reader’s Journal

<table>
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<tr>
<th>Date: ______________</th>
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<tbody>
<tr>
<td>Title of Book Student is Reading: ___________________________</td>
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<tr>
<td>Is journal complete? Yes ___ No ___</td>
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<td>Teacher notes:</td>
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Name: ____________________________________________________
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| Title of Book Student is Reading: ___________________________ |
| Is journal complete? Yes ___  No ___ |
| Teacher notes: |
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| Title of Book Student is Reading: ___________________________ |
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| Teacher notes: |
ACKNOWLEDGMENTS

These materials are the result of the work, advice, and encouragement of numerous individuals over many years. Some of those singled out here already know the depth of our gratitude; others may be surprised to find themselves thanked publicly for help they gave quietly and generously for the sake of the enterprise alone. To helpers named and unnamed we are deeply grateful.

CONTRIBUTORS TO EARLIER VERSIONS OF THESE MATERIALS


We would like to extend special recognition to Program Directors Matthew Davis and Souzanne Wright who were instrumental to the early development of this program.

SCHOOLS

We are truly grateful to the teachers, students, and administrators of the following schools for their willingness to field test these materials and for their invaluable advice: Capitol View Elementary, Challenge Foundation Academy (IN), Community Academy Public Charter School, Lake Lure Classical Academy, Lepanto Elementary School, New Holland Core Knowledge Academy, Paramount School of Excellence, Pioneer Challenge Foundation Academy, New York City PS 26R (The Carteret School), PS 30X (Wilton School), PS 50X (Clara Barton School), PS 96Q, PS 102X (Joseph O. Loretan), PS 104Q (The Bays Water), PS 214K (Michael Friedsam), PS 223Q (Lyndon B. Johnson School), PS 308K (Clara Cardwell), PS 333Q (Goldie Maple Academy), Sequoyah Elementary School, South Shore Charter Public School, Spartanburg Charter School, Steed Elementary School, Thomas Jefferson Classical Academy, Three Oaks Elementary, West Manor Elementary.

And a special thanks to the CKLA Pilot Coordinators Anita Henderson, Yasmin Lugo-Hernandez, and Susan Smith, whose suggestions and day-to-day support to teachers using these materials in their classrooms was critical.
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