



*FREE ELA & MATH LESSON PLANS FROM EDMENTUM*

---

# **6<sup>th</sup>–8<sup>th</sup> Grade**

# **Lesson Plan Bundle**

# Table of Contents

## English Language Arts Lessons

- 01 Context Clues — Pg. 5–8**  
GRADE LEVEL – 6  
**Additional Resources**  
[Context Clues Display Document](#)  
[Independent Practice](#)  
[Take a Closer Look Worksheet](#)
- 02 Cause and Effect — Pg. 9–11**  
GRADE LEVEL – 6  
**Additional Resources**  
[Life-Saving Doppler Radar Passage](#)  
[Show What You Know Worksheet & Answer Key](#)
- 03 Connotative Meanings — Pg. 12–13**  
GRADE LEVEL – 6  
**Additional Resources**  
[Pre-Assessment & Guided Practice PowerPoint](#)
- 04 Textual Evidence — Pg. 14–16**  
GRADE LEVEL – 7  
**Additional Resources**  
[Display Pages](#)  
[Independent Practice](#)
- 05 Predictions — Pg. 17–18**  
GRADE LEVEL – 7  
**Additional Resources**  
[Life of Pi](#)  
[Activity Worksheet](#)
- 06 Author’s Point of View — Pg. 19–22**  
GRADE LEVEL – 8  
**Additional Resources**  
[Display Pages](#)  
[Passages Document](#)  
[Advanced Learner Activity](#)  
[Remedial Exercise](#)
- 07 Literary Devices — Pg. 23–24**  
GRADE LEVEL – 8  
**Additional Resources**  
[Activity Worksheet](#)  
[Literary Devices Selection](#)

# Table of Contents

## Math Lessons

### 01 Surface Area and Volume — Pg. 26–28

GRADE LEVEL – 6

**Additional Resources**

[Warm-Up Activity](#)

[Nets Activity](#)

[Independent Practice Activity](#)

[Recording Sheet](#)

[Riddle Cards](#)

### 02 Inverse Operations — Pg. 29–30

GRADE LEVEL – 6

**Additional Resources**

[PowerPoint Presentation](#)

### 03 Angles in Shapes — Pg. 31–32

GRADE LEVEL – 6

**Additional Resources**

[Independent Worksheets](#)

### 04 Multi-Step Real World Problems — Pg. 33–35

GRADE LEVEL – 7

**Additional Resources**

[Warm-Up Activity](#)

[Example Problem](#)

[Guided Practice](#)

[Independent Practice Activity](#)

[Advanced learner Activity](#)

[Remedial Activity](#)

### 05 Misplaced and Dangling Modifiers — Pg. 36–37

GRADE LEVEL – 7

**Additional Resources**

[Independent Practice](#)

### 06 Domain and Range — Pg. 38–39

GRADE LEVEL – 7

**Additional Resources**

[PowerPoint Presentation](#)

### 07 Real Numbers — Pg. 40–42

GRADE LEVEL – 8

**Additional Resources**

[Teaching Points](#)

### 08 Exponents and Roots — Pg. 43–45

GRADE LEVEL – 8

**Additional Resources**

[Independent Practice](#)

[Square Root Applications](#)

[As I Was Going to St. Ives](#)



# English Language Arts Lesson Plans

**Lesson Title:**

Context Clues

**Grade Level:**

6

**Lesson Objectives:**

- Students will understand different strategies for determining the meaning of words.
- Students will use context clues to determine the meaning of unknown words.

**Learning Modalities Targeted:** Visual Auditory Kinesthetic/Tactile**Warm-Up:**

- Display page 1 of the Display Documents, and explain that when putting a jigsaw puzzle together, you must look for clues in the picture and pay attention to the shape of the puzzle piece.
- In the example, both puzzle pieces would fit in the spaces, but the picture determines which space each piece must complete.
- Sometime, when reading we come upon words that leave a missing piece in our picture of the story because we don't know what the word means. At those times, clues in the text help us determine the meaning of the unknown words.

**Materials Needed:** Notebooks, pencil/pens, display device, [Context Clues Display Document](#), [Independent Practice](#), [Take a Closer Look worksheet](#)

**Procedure:**

1. Display page 2 of the Display Documents, and tell students they will learn different ways to use context clues to determine the meaning of unfamiliar words.

2. Display page 3, and read the paragraph aloud. Draw attention to the word *captivity*, and explain that understanding the entire paragraph will help define this word. Have student volunteers tell what clues the words *rescued* and *released* give to help determine the meaning of *captivity*. Ask students what other clues help them understand the word. (Students might talk about “old enough to survive on its own” and “trainers.”)
3. Explain that these are “context clues” that help the reader figure out the meaning of the unfamiliar word.
4. Display page 4, and read the Steps to Finding Context Clues aloud.
5. Display page 5, and have students determine the meaning of the words *ballad* (love song) and *fidgeting* (moving nervously). Display page 6, and have students offer definitions of *restraint* (control over one’s desires). Have volunteers identify context clues for each word.
6. Display page 7, and have students provide definitions for *sequence* (the order in which something happens), *inventory* (list of goods or materials on-hand), and *misjudged* (estimated incorrectly). Page 8 shows the Answer Key.

**Independent Practice:**

- Distribute the Independent Practice worksheet and have students complete it.

**Closing Activity:**

- Review student answers to the Independent Practice as a class.
- Explain that using context clues can sometimes give an exact definition, as in the definition of *uranium*, and other times provide the reader with the gist of the meaning, as in *radiation*. Sometimes, it takes the entire paragraph to understand a word (*radioactive*).

### Advanced Learner Option

**Procedure:**

1. Display page 9 of the Display Documents, Context Clue Strategies.
2. Give students three unfamiliar vocabulary words to look up in a dictionary and define. Have them write the words and definitions in their notebooks. Tip: Give each student a different set of words.
3. Challenge students to write a short narrative, essay, or paragraph with their new words, writing in a context clue strategy for each word. For example, write a definition for Word 1, a description that demonstrates an example of Word 2, and an opposite statement to explain Word 3. Underline the words.
4. Have students trade papers and define the underlined words based on the context clues.

### Struggling Learner Option

**Procedure:**

1. Distribute the Take a Closer Look worksheet.
2. Work with students to understand the specific strategies for using context clues.
3. If time permits, have students apply the strategies to a recently read story to identify context clues.

### Extension Activities

- Have the class compose a song or rhyme to remember the context clue strategies and how to use them.
- Have students go on a clue search and look for context clues for words in recently read stories or books. Instruct students to make a chart in their notebooks to document the words and clues they found.

| Page | Word | Type of Clue | Definition |
|------|------|--------------|------------|
|      |      |              |            |

### ELL Teaching Tips

- **Key Lesson Language:** **general** – jigsaw puzzle, search; **academic** – context clues, definition
- **Read aloud** – Support independent reading of a task by reading it aloud to all students. Read the passage from the Independent Practice activity aloud to students.
- **Instructions on the board** – Write the instructions for the main steps of the task on the board as well as reading them aloud. For the second Extension Activity, write step-by-step directions on the board for how to complete the assignment. Encourage students to refer to the board if they have questions or need clarification.



|   |                       |
|---|-----------------------|
| <b>Reading Lesson:</b> Cause and Effect   | <b>Grade Level:</b> 6 |
| <p><b>Lesson Summary:</b> [Core: Write 2.a and Lang 5.b] Students use cause and effect strategies in informative writing. Students use language pertaining to cause and effect to describe relationships between events, scientific ideas, and steps in technical procedures. Advanced students research weather events and write paragraphs about the causes and effects of the event. Struggling students match causes and effects.</p>   |                       |
| <p><b>Lesson Objectives:</b></p> <p><b>The students will know...</b></p> <ul style="list-style-type: none"> <li>• how to describe a cause and effect relationship.</li> <li>• how to use cause and effect strategies in informative writing.</li> </ul> <p><b>The students will be able to...</b></p> <ul style="list-style-type: none"> <li>• identify cause and effect relationships.</li> <li>• use cause and effect relationships to explain topics in informational writing.</li> </ul>  |                       |
| <p><b>Learning Styles Targeted:</b></p> <p style="text-align: center;"> <input checked="" type="checkbox"/> Visual     <input checked="" type="checkbox"/> Auditory     <input checked="" type="checkbox"/> Kinesthetic/Tactile </p>  |                       |
| <p><b>Pre-Assessment:</b></p> <p>Ask students what causes them to blink. Explain that when you tell the reason for something, you are talking about a cause and effect relationship. The reason is the cause and the effect is what happens because of the reason. Tell students that there are many cause and effect relationships in everyday life. Give an example such as "I wore this sweater because I knew it would be chilly today." Ask students to share cause and effect relationships from their lives. Encourage students to use the words <i>because</i> or <i>due to</i> to show the relationship between the cause and effect. Note which students are reluctant to contribute to the discussion.</p>   |                       |
| <p><b>Whole-Class Instruction</b></p>   |                       |
| <p><b>Materials Needed:</b> Computer and projector to display images of tornadoes from web sites such as <a href="http://www.nssl.noaa.gov/edu/safety/tornadoguide.html">http://www.nssl.noaa.gov/edu/safety/tornadoguide.html</a>, <a href="http://www.fema.gov/kids/v_lib.htm#tornado">http://www.fema.gov/kids/v_lib.htm#tornado</a>, <a href="http://celebrating200years.noaa.gov/breakthroughs/tornadowarnings/welcome.html">http://celebrating200years.noaa.gov/breakthroughs/tornadowarnings/welcome.html</a>; <a href="#">Life-saving Doppler Radar Passage*</a>; Books and magazines about weather events from the school library; Computer access to sites such as <a href="http://www.nssl.noaa.gov/edu/safety/tornadoguide.html">http://www.nssl.noaa.gov/edu/safety/tornadoguide.html</a>, <a href="http://www.fema.gov/kids/v_lib.htm#tornado">http://www.fema.gov/kids/v_lib.htm#tornado</a>; Paper and pencils</p>    |                       |
| <p><b>Procedure:</b></p> <p><b>Presentation</b></p> <ol style="list-style-type: none"> <li>1) Display or project a photograph of a tornado.</li> <li>2) Lead a discussion about the cause and effect of severe weather. Ask such questions as: What is the difference between a hurricane and a tornado? (A hurricane is a huge storm that forms over water and that may have several tornadoes). Have you ever noticed that there is usually rain or rough winds before the weather changes? What causes severe weather? (Often from the collision of a cold and warm front). What are the effects of severe weather? (Damage to buildings from high winds and flying objects, injury and death to people and animals) If you heard that there was a tornado warning, how would that affect you? (scared, take cover in lower levels of a building, small interior rooms like closets, ditches if you watch for flooding)</li> </ol> |                       |

**Guided Practice**

- 3) Project or display illustrations of how a tornado forms. Describe the process making sure to use the words *cause*, *effect*, *result*, and *because* such as: A cold front moves east causing cold or dry winds to begin rolling along the ground. When these winds run into warm moist air, it causes the rolling winds to rise in a column. The effect, or result, of these rolling winds is a tornado. Tornadoes can cause a lot of damage because the winds in the tornado can reach speeds over 250 miles per hour.
- 4) Project or display illustrations of tornado damage. Discuss the effects of tornadoes by asking such questions as: What parts of buildings do you think would be the safest to be in? Why? What types of structures would be the most likely to be damaged? Remind students to use the words *cause*, *effect* and *because* in describing the cause and effect relationships between tornadoes and the damage they cause.
- 5) Project the Life Saving Doppler Radar passage\*, and have students take turns reading paragraphs. Discuss the benefits of Doppler radar by asking questions such as: Why is Doppler radar beneficial? How has it saved lives? What other ways has Doppler radar been useful? Guide students in using cause and effect relationship language in their answers.

**Independent Practice**

- 6) Have students research the causes of a hurricane, an earthquake, and a volcano.
- 7) Provide computer sites or hard copy sources for students to use for research.
- 8) For the On Your Own Activity, tell students to write a sentence about the cause of each one of these events.
- 9) Remind students to use the words *because*, *due to*, *result*, and *causes* to show the cause and effect relationships in each of their sentences.

**Closing Activity**

- 10) Discuss severe weather that students have experienced. What were the causes of the severe weather and what were the effects?
- 11) Have students write one fact about hurricanes (or other natural disaster) using cause and effect language. The fact will be used as an exit pass from class.

**Advanced Learner**

**Materials Needed:** Access to computer Web sites such as: <http://scifun.chem.wisc.edu/HomeExpts/HOMEEXPTS.HTML>, <http://www.kids-science-experiments.com/index.html>; books and magazines about science experiments from the school library; Paper and pencils

**Procedure:**

- 1) Have students choose a science experiment such as the cause and effects of static electricity, the cause and effects of temperature changes, the cause and effects of light, the cause and effects of water.
- 2) Provide computer sites or hard copy sources for students to research science experiments.
- 3) Tell students to write a short report (approximately 2 paragraphs) about the causes and effects of what is being tested in the experiment.
- 4) Allow time for students to share their reports.

**Struggling Learner**

**Materials Needed:** [Show What You Know Worksheet\\*](#)

**Procedure:**

- 1) Hand each student a copy of the Show What You Know worksheet\*.
- 2) Read the directions. Allow students to work independently on the worksheet, checking in on their progress. When the students have finished, review and discuss their answers.
- 3) Have the students complete the On Your Own activity (explained in the Independent Practice section).

**\*see supplemental resources**

**ELA Lesson:** Connotative Meanings

**Grade Level:** 6

**Lesson Summary:** For pre-assessment, the teacher will review the difference between denotation and connotation, write a series of words on the board, and ask students to provide the denotation and connotation of each word and use it in a sentence. The teacher will then project a series of paired words and ask students to identify the word with the stronger connotation and explain why. For guided practice, the students will explain the difference between two like words in terms of their connotation and explain which fits the sentence better. For independent practice, the students will use words with strong connotations in a sentence. Advanced Learners will write an editorial using connotation for their word choice, and Struggling Learners will illustrate their sentences from the independent practice to show their understanding of a word's connotation.

**Lesson Objectives:**
**The students will know...**

- the distinction between denotation and connotation.
- the importance of connotative meaning in writing.

**The students will be able to...**

- recognize words with strong connotations.
- use connotations in writing.

**Learning Styles Targeted:**

x Visual      x Auditory      x Kinesthetic/Tactile

**Pre-Assessment:** Project the Pre-assessment and Guided Practice PowerPoint\* or write the words *denotation* and *connotation* on the board. Write the words *puny*, *cheap*, and *anxious* on the board. Point out that each of these words has a denotation, or literal meaning. They also have connotations, or associations that go beyond a literal meaning.

Challenge students to provide the denotation and connotation of each word and then use it in a sentence.

**Whole-Class Instruction**

**Materials Needed:** [Pre-assessment and Guided Practice PowerPoint\\*](#); Notebook; pens and pencils;

**Procedure:**

- 1) Write or project the following on the board: hungry/starving; serious/somber; happy/ecstatic. Ask for students to define each word. Accept that *starving* means you are "really hungry." *Somber* is 'a kind of sad seriousness.' Being *ecstatic* means you are "really happy."
- 2) Point out that while some words mean basically the same thing, certain words within that group have particular meanings or connotations. A connotation goes beyond the literal meaning of a word and helps you to picture what the word is describing in your mind. When you are trying to find the best word to describe something, think about its connotation.

**Guided Practice**

- 3) Display the guided practice sentences from the Pre-assessment and Guided Practice PowerPoint\*, have students explain the difference between the two boldfaced words in each of the following sentences, and then choose the one that best fits the sentence.

**Independent Practice**

- 4) Display slide 8 of the Pre-assessment and Guided Practice PowerPoint, or write the following words on the board. Have students write sentences that best express the connotative meanings of the words.

blaring  
 furious  
 bizarre  
 hilarious  
 annoying

**Closing Activity**

- 5) Have students explain the difference between connotation and denotation on a scrap piece of paper and pass it in on their way out.

**Advanced Learner**

**Materials Needed:** Notebook; pens and pencils

**Procedure:**

- 1) Challenge students to write an editorial about a matter of concern to them. Remind students that writers use words with definite connotations when they want to get a specific reaction from their readers. Have students underline the words they used connotatively, and remind them to be prepared to explain why they used them.
- 2) If time permits, have students exchange editorials. Have students comment on the writer’s choice of words.

**Struggling Learner**

**Materials Needed:** Drawing materials; pens and pencils; [Pre-assessment and Guided Practice PowerPoint\\*](#)

**Procedure:**

- 1) Have students draw a picture suggested by the connotative word in step 3. Draw the first word together with the students.
- 2) Have students show their drawings to a partner, and explain the details of their drawing and why their pictures illustrate the connotations of the word.
- 3) Have students complete the Independent Practice activity on slide 8 of the Pre-assessment and Guided Practice PowerPoint.

\*see supplemental resources

**Lesson Title:**

Textual Evidence

**Grade Level:**

7

**Lesson Objectives:**

- Students will understand that citing specific textual evidence adds necessary information and credibility to the analysis of text.
- Students will cite specific textual evidence to support analysis of literary text as well as support for inferences.

**Learning Modalities Targeted:** Visual Auditory Kinesthetic/Tactile**Warm-Up:**

- Project Display Page 1 and read the first stanza of “My Shadow” to the class.
- Ask students to cite evidence that Stevenson is talking about his shadow (very, very like me, jumps before me when I jump into my bed).

**Materials Needed:** notebooks, pencil/pens, display device, [Display Pages](#), [Independent Practice worksheet](#), novels

**Procedure:**

1. Ask students what the word *evidence* means (obvious, a thing or things helpful in forming a conclusion or judgment, a sign). Ask students what they think of when they think about *evidence* (evidence submitted in a court to prove a case).
2. Explain that writers include evidence in their stories to help the reader understand the characters and the events happening in the story.

2. Project Display Page 2 and read the text aloud. Ask students to characterize Tom (he is forgetful). Ask students why he is forgetful. Students may say the text doesn't allow for inference.
3. Display page 3 and read the text aloud. Ask students why Tom is forgetful. (Mom was too busy to wake him up in time to get ready for school. Tom may be stressed himself because of twin babies in the house, dad working long hours, etc.) Point out that the author gives plenty of textual evidence to help the reader understand Tom's problems.

**Independent Practice:**

- Distribute the Independent Practice worksheet. If necessary, Project Display Page 4 and read the passage aloud. Have students complete the worksheet and share their responses.

**Closing Activity:**

- Have students give a reason for citing specific textual evidence.

**Advanced Learner Option****Procedure:**

1. Have students write a characterization of the protagonist (main character) of a novel they are currently reading.
2. Instruct students to cite textual evidence to support their characterizations.

**Struggling Learner Option****Procedure:**

1. Have students describe and then write a paragraph about a dream they had that seemed real. Have them provide evidence that it was a dream and not real.
2. Have them share their writing with the class.

### Extension Activities

- Have students work with a partner. Have one student write an opening statement for a story, such as “Gary had always been a funny guy, even as a kid.” The partner should write a statement providing textual evidence, such as “Once, when he was 5, he ate a whole pint of blueberries that he found in the refrigerator, and when his mom asked about it, even though half his face was blue, he replied, “What blueberries?”
- Have students write a positive character trait they have observed in each classmate and support it with textual evidence. For example, “Constance is helpful. She always gets the door for me when my arms are full of books.”

### ELL Teaching Tips

- **Key Lesson Language: general** – court, forgetful, twins; **academic** – textual evidence, inference, stanza, characters
- **Read aloud** – Support independent reading of a task by reading it aloud to all students. Read the passage for the Independent Practice aloud to the class before students complete the exercise individually.
- **L1 production** – Allow students to demonstrate understanding of a content task by responding in their home language or by doing preparatory work in their home language before responding in English. Allow students to complete the second Extension Activity in their native language. Challenge them to translate their sentences into English with the help of their bilingual dictionary.



**Reading Lesson:** Predictions

**Grade Level:** 7

**Lesson Summary:** The teacher reads a paragraph and asks students to predict what will happen next. The teacher explains that predicting what will happen next is an important way to understand a passage. The teacher then asks students to brainstorm different ways that predicting could help them understand a passage. In the Guided Practice, students practice predicting using the questions in the Activity Worksheet. During Independent Practice, students read an excerpt from *Life of Pi* and predict what will happen next in the story. For a closing activity, students share their predictions with the class. Advanced learners work with a partner to write a passage and make predictions about what will happen next. Struggling learners work with the teacher to brainstorm different strategies that predict future actions in a passage.

**Lesson Objectives:**
**The students will know...**

- that making predictions while reading can aid understanding of a text.

**The students will be able to...**

- make and confirm predictions about a literary fiction or nonfiction text.
- use clues in the text to predict what will happen next.
- improve their comprehension of a passage by using prediction.

**Learning Styles Targeted:**
 Visual     Auditory     Kinesthetic/Tactile

**Pre-Assessment:**

- 1) Choose a text and read a paragraph from it to the class.
- 2) Pause frequently to ask students questions such as “What do you think will happen next?” or “What do you think the character might do next?”

**Whole-Class Instruction**

**Materials Needed:** excerpt from *Life of Pi*\*, [Activity Worksheet](#)\*, paper, and pencils or pens

**Procedure:**
**Presentation**

- 1) Explain that predicting what will happen next is an important way to understand a passage and improve comprehension.
- 2) Ask students to brainstorm different ways that predicting could help them better understand a passage. Write their answers on the board.

**Guided Practice**

- 3) Using the [Activity Worksheet](#)\*, ask students to predict what might happen next in each passage.

**Independent Practice**

- 4) Distribute the excerpt from *Life of Pi*\* to the class.
- 5) Ask students to make at least 3 predictions that might help them to better understand what might happen next and why.

**Closing Activity**

- 6) Invite students to share their predictions with the class and explain why they think their predictions will come true.

**Advanced Learner**

**Materials Needed:** pencils and paper or computer

**Procedure:**

- 1) Have students work in pairs. Ask each student to write a short passage and share the first few sentences with his/her partner.
- 2) Ask students to list at least 3 predictions about what will happen next in the passage.
- 3) Have students share whether or not the predictions were correct.

**Struggling Learner**

**Materials Needed:** books, magazines, and Internet stories

**Procedure:**

- 1) Review the concept of prediction with students.
- 2) Brainstorm different strategies with students that will predict future actions in a passage.
- 3) Monitor student understanding and provide guidance where needed.

**\*see supplemental resources**

**Lesson Title:**

Author's Point of View

**Grade Level:**

8

**Lesson Objectives:**

- Students will recognize an author's point of view or purpose in informational text.
- Students will determine an author's point of view in informational text and analyze how the author responds to conflicting evidence.

**Learning Modalities Targeted:** Visual Auditory Kinesthetic/Tactile**Warm-Up:**

- Begin a discussion about snow (or, depending on your area, the beach or mountain hiking, etc.). Record brief student responses in an idea web (see Display Page 1). Note student responses who have no experience with snow as well. Differentiate between students who have positive experiences with snow from those who have negative or no experiences.
- Explain that if Positive Student A were to write an essay about snow, it would be very different from one written by Negative Student B. "A" would probably focus on all the fun that can be had in snow, "B" on all the problems and difficulties snow causes.
- If Inexperienced Student C were to read both essays, he/she would need to consider the two authors' points of view carefully to get a full understanding of snow.

**Materials Needed:** Notebooks, pencil/pens, display device, [Display Pages](#), [Passages document](#), different news reports of the same topic, [Advanced Learner Activity](#), [Remedial Exercise](#)

**Procedure:**

1. Project page 2 from the Display Pages, and tell students it is important to identify an author's point of view and purpose when reading an informational text.
2. Project page 3, and discuss three things to look for when evaluating the author's point of view and purpose (background, content, writing style).
3. Project page 4, and distribute copies of the Passages for evaluation and discussion. Read "Food Safety Concerns You" aloud. Then, project page 5 and read "Jorge A. Hernandez's View on Food Safety."
4. Project page 3, and discuss how the authors' backgrounds affect their points of view on the topic (i.e., the author from the FDA may have a responsibility to generally inform the people without alarming them; whereas, Mr. Hernandez has a more personal connection with the topic).
5. Discuss the content, identifying statements that reveal point of view (e.g. "Being from a third world country and having a degree in medical sciences, I became acutely aware of foodborne diseases and the suffering and death they cause").
6. Finally, discuss the two writing styles, identifying the use of more impassioned descriptive words in the second piece (e.g., *acutely*, *suffering*, *vulnerable*, *unnecessary*, *ravaged*).
7. Discuss how each piece informs the students' knowledge of food safety.

**Independent Practice:**

- Distribute copies of an informational piece on a selected topic for students to read.
- Project page 3, and have students write a brief evaluation of the piece based on an analysis of author's background, content, and writing style.
- Distribute copies of a less objective piece on the same topic, and have students write another evaluation.
- HINT: News reports are a good source for this exercise, with one report from a reputable news agency and another from a "gossip column" type article.

**Closing Activity:**

- Review student evaluations of the Independent Practice as a class.

**Advanced Learner Option****Procedure:**

1. Distribute copies of the Advanced Learner Activity.
2. Read the directions, and make sure students understand the assignment.
3. When students have completed the assignment, have them discuss their graphic organizers with a partner.

**Struggling Learner Option****Procedure:**

1. Distribute copies of the Remedial Exercise.
2. Read the directions, and work with students to fill out the graphic organizer.
3. Have students use highlighters of different colors to find information in the passage.

### Extension Activities

- Group students based on the opening activity to have “positive,” “negative,” and “neutral” students in each group. Instruct students to write about the topic (snow) by choosing a particular point of view. Students with opposing points of view may offer conflicting views to be incorporated into the writing.
- Based on the opening activity, have students choose a point of view about the topic (snow), whether “positive,” “negative,” or “neutral,” and write an essay from that point of view. Instruct students to incorporate opposing points of view and decide how to handle those conflicting views in their essay.

### ELL Teaching Tips

- **Key Lesson Language:** **general** – head, tail, rabbit, good luck; **academic** – context clue, dictionary, homophone, homonym, homograph
- **Preview text** – Provide students with a text or video ahead of time so they can review or explore the material before accessing it in a class activity. Prior to the start of the lesson, give students a copy of the Passages document, the Independent Practice passage, and the Struggling Learner Option passage to read. Encourage students to look up the meaning of unfamiliar words in their bilingual dictionary.
- **L1 support** – Allow students to use their home language with a bilingual dictionary or a native language text. Let students complete the second Extension Activity in their native language. Challenge students to translate their essay into English with the help of their bilingual dictionary.

|  |                       |
|--|-----------------------|
| <b>Reading Lesson:</b> Literary Devices  | <b>Grade Level:</b> 8 |
| <p><b>Lesson Summary:</b> Students will learn how to recognize literary devices, use them to arrive at the meaning of a literary selection, and include literary devices in their own writing. The class will free-write on aging. The teacher will model reading for emphasis. The class will read the selection and note the literary devices. Students will complete an Activity Worksheet on literary devices, expand their earlier free-write into a poem that utilizes literary devices learned in the lesson, and close by noting a memorable literary device from the poem. Advanced learners will write an analysis of the selection. Struggling learners, with teacher assistance, will write a poem using literary devices.</p>   |                       |
| <p><b>Lesson Objectives:</b></p> <p><b>The students will know...</b></p> <ul style="list-style-type: none"> <li>that authors use literary devices such as word choice and structure to convey meaning and enhance reader enjoyment.</li> </ul> <p><b>The students will be able to...</b></p> <ul style="list-style-type: none"> <li>identify literary devices and use them to interpret a poem.</li> </ul>   |                       |
| <p><b>Learning Styles Targeted:</b></p> <p style="text-align: center;"> <input checked="" type="checkbox"/> Visual      <input checked="" type="checkbox"/> Auditory      <input type="checkbox"/> Kinesthetic/Tactile </p>  |                       |
| <p><b>Pre-Assessment:</b></p> <ol style="list-style-type: none"> <li>1) Read a favorite poem to the students such as "Stopping by Woods on a Snowy Evening" by Robert Frost.</li> <li>2) Ask students to identify literary devices such as simile, metaphor, alliteration, analogy, word choice, and imagery. Give guidance as needed.</li> <li>3) Take note of students who have little knowledge of literary devices and have difficulty identifying them.</li> </ol>  |                       |
| <p><b>Whole-Class Instruction</b></p>  |                       |
| <p><b>Materials Needed:</b> <a href="#">Activity Worksheet*</a> and a copy of the <a href="#">selection*</a> for each student, paper, and pencils</p>  |                       |
| <p><b>Procedure:</b></p> <p><b>Presentation</b></p> <ol style="list-style-type: none"> <li>1) Ask students to recall something in their lives that has aged: perhaps a person, a pet, a building, or an object.</li> <li>2) Ask them to free-write for five minutes about details that describe the aging process.</li> <li>3) Model reading one student's passage dramatically by building to a crescendo to suggest crisis then softening your voice to suggest weakening.</li> <li>4) Ask student volunteers to read their passages.</li> <li>5) Distribute copies of the selection*. Have gifted readers read aloud "Flip's Position."</li> <li>6) Remind students how dramatic reading of the writing samples emphasized details. Discuss how flow of the lines in the selection suggests movement and elicit why this might be relevant for a</li> </ol> |                       |

poem about an ex- basketball star.

- 7) Accept that line flow shows movement, like the movement of a basketball star, now a gas station attendant who is still fast but growing older as time flows on. Note how the last line just stops, like Flip’s early promise of basketball greatness.
- 8) Emphasize how form and structure can imitate and reinforce the theme of the poem. Ask students to identify other literary devices in the selection such as simile (hands are like wild birds), metaphor (he’s a statue), alliteration (Flip’s still fast), and analogy (comparing making 90 buckets to changing a tire in 90 seconds).

**Guided Practice**

- 9) Have students complete the Activity Worksheet\*, identifying significant word choices.
- 10) Discuss and review the answers as a group.

**Independent Practice**

- 11) Have students expand the material from their free-write into a stanza or short poem, using the devices they learned in the lesson on word choice and structure.
- 12) Ask students to read aloud their poems and discuss the literary devices they used.

**Closing Activity**

- 13) Have each student cite one literary device (including word choice) that made his or her poem memorable.

**Advanced Learner**

**Materials Needed:** Copy of the [selection](#), paper, and pencils

**Procedure:**

- 1) Ask students to reread the selection and underline the literary devices they find.
- 2) Have students write a short paragraph analyzing “Flip’s Position,” noting how the literary devices helped convey meaning.
- 3) Ask students to read their paragraphs aloud and discuss as a group.

**Struggling Learner**

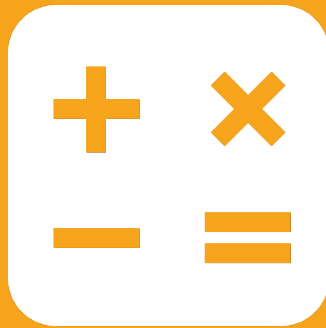
**Materials Needed:** chalkboard or whiteboard

**Procedure:**

- 1) Tell students you will write a poem as a group using literary devices. Brainstorm a topic for the poem. Write a title on the board.
- 2) Ask students to suggest lines for the poem and write them on the board. Encourage them to include literary devices such as simile, metaphor, and alliteration. Remind them of the importance of word choice (use expressive adjectives and adverbs).
- 3) Ask volunteers to read the poem. Students may suggest revisions.

**\*see supplemental resources**





# Math Lesson Plans

**Lesson Title:**

Surface Area and Volume

**Grade Level:**

6

**Lesson Objectives:**

- Students will be able to represent three-dimensional figures using nets made up of rectangles and triangles.
- Students will be able to use the nets to find the surface area of these figures.

**Learning Modalities Targeted:** Visual Auditory Kinesthetic/Tactile**Warm-Up:**

- Give each student a copy of the Warm Up Activity and a sheet of notebook paper. Project the Warm Up Activity, ask students to solve problem 1 independently. Have students show their work on the notebook paper. Once each student is done with problem 1, go over how to find the area of a rectangle. Then, repeat the process with problems 2 and 3, going over the formulas for area of a triangle and area of a square.

**Materials Needed:** writing utensils, notebook paper, [Warm Up Activity](#), [Nets Activity](#), colored pencils, scissors, tape, rulers, [Independent Practice Activity](#), everyday objects in the shape of prisms and pyramids (cereal boxes, tissue boxes, blocks), centimeter grid paper, [Recording Sheet](#), [Riddle Cards](#)

**Procedure:**

1. Before the lesson, cut out and create the three-dimensional figures from the Nets Activity to use as examples during the lesson.

**Procedure:**

2. Put students into pairs and give each a copy of the Nets Activity, scissors, colored pencils, a ruler, and tape. Have the students cut out each of the nets. Then, one by one hold up the figures created before the lesson and ask the students which net creates it. Have the students write the name of the figure on the net in front of them.
3. Next, discuss as a class the meaning of surface area. Describe a few ways for students to think about what surface area is by looking at one of the figures and imagining painting the outside of it or wrapping it with gift wrap. Once students understand the meaning of surface area, explain to them how to calculate it by finding the area of each face and adding them altogether. Refer to the Warm Up Activity to reinforce the area formulas.
4. Using a different colored pencil for each face, have students work with their partner to find the side lengths and areas of each face. Tell the students to mark the dimensions and area directly on each side. Then, have the students find the surface area by adding up all the areas. Once finished with their calculations, have the students use tape to build their three-dimensional figure and mark their surface area calculation on the top or bottom of the figure. These can be used to display around the classroom.

**Independent Practice:**

- Give each student a copy of the Independent Practice Activity to complete.

**Closing Activity:**

- Go over the answers to the Independent Practice Activity as a class.

### Advanced Learner Option

**Procedure:**

1. Pair students and give each pair 1 or 2 everyday objects in the shape of prisms and pyramids (cereal boxes, tissue boxes, blocks). Ask students to brainstorm how the net of their object could be used to find the surface area of the three-dimensional object. Lead students to discover that the surface area can be found by finding the area of each face on the net and adding to find the total surface area.
2. Have students use centimeter grid paper and rulers to create a net of their object, labeling the dimensions. Then, have them find the area of each face. Finally, have them find the sum to find the total surface area of the three-dimensional object. Write the answers on the Recording Sheet.
3. Have the objects rotate through several pairs. Create the net and find the surface area of each object. Write the answers on the Recording Sheet.

### Struggling Learner Option

**Procedure:**

1. In a small group, work through each figure on the Independent Practice Activity. Take turns having students build the three-dimensional figure nets using centimeter grid paper and find the surface area. Repeat through each figure.

### Extension Activities

- Give students the set of Riddle Cards. Have students answer the questions on the cards. Challenge the students to create 2-3 riddles of their own.
- Find a rectangular prism in the classroom or home environment. Draw the net of the real-world object on centimeter grid paper. Use a ruler to find the measurements and record them. Calculate the surface area. Do this for a cube and a pyramid as well.

**Math Lesson:** Inverse Operations

**Grade Level:** 6

**Lesson Summary:** Students will review addition-subtraction and multiplication-division fact families from the point of view of inverse operations. Students will assemble, generate, and identify fact families. Advanced students will also learn about fact “couples.” Struggling students will receive additional time to review the fact families and can be allowed to use multiplication tables if necessary.

**Lesson Objectives:**

**The students will know...**

- that addition and subtraction are inverse operations.
- that multiplication and division are inverse operations.

**The students will be able to...**

- assemble fact family groups of three numbers and list the included equations.

**Learning Styles Targeted:**

Visual     Auditory     Kinesthetic/Tactile

**Pre-Assessment:**

Use this activity to introduce the topic and assess students’ prior knowledge of inverse operations.

- 1) Show a simple addition/subtraction fact family, for example 3, 5, and 8. Ask, “Can you list 4 ways to combine these numbers using the signs +, -, and =?” Record the results on the board.
- 2) Show a simple multiplication/division fact family, for example 2, 3, and 6. Ask, “Can you list 4 ways to combine these numbers using  $\times$ ,  $\div$ , and =?” Record the results on the board.

**Whole-Class Instruction**

**Materials Needed:** Index cards with the numbers 1–100 written on them, [PowerPoint Presentation\\*](#)

**Procedure:**  
**Presentation:**

1. Remind students about fact families:
  - 1) Give the definition of an *inverse operation*: an opposite operation that undoes another.  
ex.  $5 + 6 = 11$ ,  $11 - 5 = 6$ .
  - 2) To generate an Addition/Subtraction Fact Family:
    - start with 2 addends (ex.  $7 + 8 = 15$ )
    - switch them around ( $8 + 7 = 15$ )
    - then start with the sum and subtract each addend ( $15 - 7 = 8$ ,  $15 - 8 = 7$ ).
  - 3) To generate a Multiplication/Division Fact Family:
    - start with two factors or multiplicands (ex.  $4 \times 5 = 20$ )
    - switch them around ( $5 \times 4 = 20$ )
    - then start with the product and divide by each factor ( $\frac{20}{4} = 5$ ,  $\frac{20}{5} = 4$ )

4) Play the Silent Fact Family Game: Shuffle and pass out index cards with numbers 1–100 written on them. At “go,” students silently try to assemble in groups of three, numbers that make a fact family of positive integers. At first, specify that the fact family must be addition/subtraction or multiplication/division in advance. Then, in subsequent rounds, allow either to count. The first group to assemble in a “family” calls out “fact family” and holds up their cards. Have the students state the equations in the family; if they are valid, then each student in the group gets a point. Play subsequent rounds until one or more students have three points.

**Guided Practice:**

2. Inverse Operations PowerPoint Challenge: The slides show sets of four numbers (no operators): identify the one that does not belong to the fact family.

**Independent Practice:**

3. How many multiplication/division fact families can you write using factors that multiply to the number 60? (6; 4 equations based on each of  $1 \times 60$ ,  $2 \times 30$ ,  $3 \times 20$ ,  $4 \times 15$ ,  $5 \times 12$ ,  $6 \times 10$ .)
4. How many multiplication/division fact families can you write with the factors that multiply to the numbers 72, 84, 90, and 96? (6 each)

**Closing Activity:**

5. Class challenge: Think of two fact families that work for both addition/subtraction and multiplication/division. (2, 2, and 4; 0, 0, and 0)

**Advanced Learner**

**Materials Needed:** Teacher-prepared differentiated problems for Independent Practice

**Procedure:**

1. Once the patterns of addition/subtraction and multiplication/division are solid, include fact “couples” based on the inverse operations of raising to a power and taking a root. For example,  $2^3 = 8$ , and  $\sqrt[3]{8} = 2$ .

**Struggling Learner**

**Materials Needed:** Multiplication table

**Procedure:**

1. Ensure addition/subtraction fact families are firmly established before moving to multiplication/division.
2. Consider allowing the use of a multiplication facts table; point out the three numbers on the table.

**\*see supplemental resources**

**Math Lesson:** Angles in Shapes

**Grade Level:** 6

**Lesson Summary:** Students will derive the formula for the sum of angle measures for a triangle and a quadrilateral. Students will then find missing angle measures in triangles and quadrilaterals. Advanced students will investigate further, looking at angle measures in hexagons and octagons. Struggling students will draw triangles with a starting angle (such as  $90^\circ$ ) and determine the sum of the other two angles.

**Lesson Objectives:**

*The students will know...*

- that the sum of angle measures in a triangle is  $180^\circ$ .
- that the sum of angle measures in a quadrilateral is  $360^\circ$ .

*The students will be able to...*

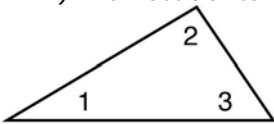
- find missing angle measures in triangles and quadrilaterals.

**Learning Styles Targeted:**

Visual     Auditory     Kinesthetic/Tactile

**Pre-Assessment:**

- 1) Ask students to estimate the measure of each angle in the triangle:



*Note students who do not give reasonable estimates.*

**Whole-Class Instruction**

**Materials Needed:** blank paper, scissors, 1 copy of the [Independent Practice\\*](#) per student

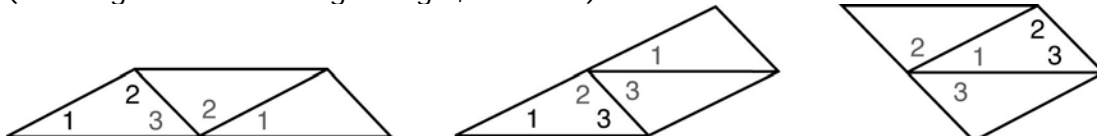
**Procedure:**

**Presentation**

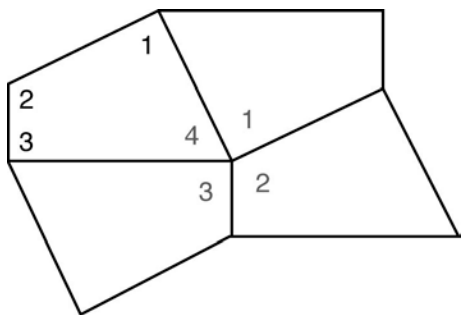
- 1) Briefly discuss the pre-assessment (Angle 1  $\approx 31^\circ$ , Angle 2  $\approx 93^\circ$ , Angle 3  $\approx 56^\circ$ ). Explain that when working with angle measures it is useful to estimate to check that results are reasonable.
- 2) Explain that the class will do an investigation to find the sum of angle measures in a triangle and a quadrilateral.

**Guided Practice**

- 3) Have students work in groups with 4 sheets of paper.
  - Cut out 3 triangles from three stacked sheets. Label the angles on each triangle 1, 2, and 3.
  - Arrange the triangles so that three angles meet at one point as shown below. What do you notice? (The angles form a straight angle, or  $180^\circ$ .)



- Repeat the process with 4 sheets, but cut out a quadrilateral and number angles 1–4. What do you notice? (The angles will complete a circle, adding to  $360^\circ$ .)



- 4) Have students compare their results with other groups to see that the results are always the same.

### Independent Practice

- 5) Have students work to complete the Independent Practice.

### Closing Activity

- 6) As a challenge problem, ask the class what the angle measures in a triangle are if the sum of two angle measures equals the third angle measure ( $45^\circ, 45^\circ, 90^\circ$ ).

### Advanced Learner

**Materials Needed:** paper and pencil

#### Procedure:

- 1) Draw a pentagon on the board, and ask students what they think the angle measures will add to. After some discussion, draw a triangle on the board, and then a rectangle. Divide the rectangle into two triangles. This should lead to the idea that the pentagon can be divided into three triangles.
- 2) Discuss that part of the reason that the angles in a quadrilateral add to  $360^\circ$  is because any quadrilateral is made up of two triangles; any pentagon is made up of three triangles.
- 3) Have students investigate to find the sum of angle measures for a hexagon and an octagon.
- 4) Discuss students' solutions and strategies, and challenge students to find a way to determine the sum of angle measures for any polygon.
- 5) Discuss the general formula, where angle sum =  $180^\circ(n - 2)$ , where  $n$  is the number of sides of the polygon.

### Struggling Learner

**Materials Needed:** paper and pencil

#### Procedure:

- 1) Have students draw a right angle, and then complete a triangle by drawing the hypotenuse. Ask students to estimate the measure of the other angles.
- 2) Discuss student estimates, leading to the conclusion that the other two angle measures must add to  $90^\circ$  ( $180 - 90^\circ = 90^\circ$ ).
- 3) Have student draw other triangles with a starting angle, and estimate the measure of the other two angles, keeping in mind that they must add to  $180^\circ$  and the starting angle measure.
- 4) Discuss students' solutions and strategies.

\*see supplemental resources



**Lesson Title:** Multi-Step Real World Problems      **Grade Level:** 7

**Lesson Objectives:**

- Students will be able to solve multi-step real world problems involving multiplication and division.

**Learning Modalities Targeted:** Visual Auditory Kinesthetic/Tactile**Warm-Up:**

- Put students in pairs, and give each pair scissors and a copy of the Warm-Up Activity. Read the directions to students, and let them work in their pairs. After all pairs have finished, go over the correct order as a class and discuss each step. Create a poster on chart paper that lists the four steps in order so that students can refer to it throughout the lesson.

**Materials Needed:** [Warm-Up Activity](#), scissors, chart paper, [Example Problem](#), writing utensils, [Guided Practice](#), [Independent Practice Activity](#), [Advanced Learner Activity](#), [Remedial Activity](#)

**Procedure:**

1. Explain to students that they will use the problem-solving steps from the Warm-Up Activity to help them solve multi-step problems. Project a copy of the Example Problem where students can see. Read the problem aloud for the students and go through the process of solving it as outlined in the Example Problem.
2. Put students into pairs and give each a set of Problems and Problem-Solving Mats from the Guided Practice.

Explain to students to work with their partners and solve the problems using the problem-solving steps. Leave the Example Problem projected for students to reference. When students have finished, go over the correct answers as a class.

**Independent Practice:**

- Give each student a copy of the Independent Practice Activity to complete.

**Closing Activity:**

- Go over the answers to the Independent Practice Activity as a class.

**Advanced Learner Option****Procedure:**

1. Give each student a copy of the Advanced Learner Activity. Read the story aloud and have students answer the questions that follow it. When students understand the directions, allow them to work independently.
2. When students are finished, go over the correct answers as a group.

**Struggling Learner Option****Procedure:**

1. Give each student a copy of the Remedial Activity. Show students that the steps to work the problems are listed for each problem. Let them work independently.
2. When each student is finished, go over the correct answers as a group.

### Extension Activities

- Have each student write five multi-step real world problems that use the four operations. Have students solve their problems using the problem-solving steps.
- Have two students get together. Instruct each student to write a multi-step real-world problem. Then, have them switch problems and find the solution to their partner's problem. Together, have them check the answers for accuracy.

### ELL Teaching Tips

- **Key Lesson Vocabulary: general** - devise
- **L1 support** – Allow students to use their home language with a bilingual dictionary or a native language text. Let students use their bilingual dictionary throughout the lesson to look up unfamiliar words. If possible, give students who are particularly new to using English word problems in their native language to solve.
- **Visual organizer** – Provide a visual organizer to aid all students in structuring the activity or text. Encourage students to recreate the problem-solving poster from the Warm-Up each time they solve a word problem to help them visualize the steps they need to take.

|   |                       |
|---|-----------------------|
| <b>Math Lesson:</b> Misplaced and Dangling Modifiers  | <b>Grade Level:</b> 7 |
| <p><b>Lesson Summary:</b> Students identify and correct misplaced and dangling modifiers. They also write sentences with misplaced and dangling modifiers for partners to correct. Advanced learners write a humorous poem or dialogue based on misplaced modifiers. Struggling students write jokes with misplaced modifiers.</p>  |                       |
| <p><b>Lesson Objectives:</b></p> <p><b>The students will know...</b></p> <ul style="list-style-type: none"> <li>when modifying phrases and clauses are misplaced.</li> </ul> <p><b>The students will be able to...</b></p> <ul style="list-style-type: none"> <li>place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.</li> </ul>  |                       |
| <p><b>Learning Styles Targeted:</b></p> <p style="text-align: center;"> <input checked="" type="checkbox"/> Visual     <input checked="" type="checkbox"/> Auditory     <input checked="" type="checkbox"/> Kinesthetic/Tactile </p>  |                       |
| <p><b>Pre-Assessment:</b></p> <p>Use this quick assessment to see if students can determine the modifying clause.</p> <ol style="list-style-type: none"> <li>Write this sentence on the board: I shot an elephant in my pajamas.</li> <li>Ask students what the phrase <i>in my pajamas</i> describes.</li> <li>Note students who do not understand the misplaced modifier.</li> </ol>  |                       |
| <p><b>Whole-Class Instruction</b></p>   |                       |
| <p><b>Materials Needed:</b> <a href="#">Independent Practice</a> with Misplaced and Dangling Modifiers*</p>   |                       |
| <p><b>Procedure:</b></p> <p><b>Presentation</b></p> <ol style="list-style-type: none"> <li>Repeat the famous Groucho Marx joke: I shot an elephant in my pajamas. How he got in my pajamas, I'll never know. Explain that this is a misplaced modifier, a word, phrase, or clause acting as an adverb or adjective that is describing an unintended word.</li> <li>Give students a minute to put these words together in a sentence: gold lost man's he a watch.</li> <li>Review student answers and write them on the board. Discuss the placement of the word <i>gold</i>. It's not a gold man. It's a gold watch.</li> <li>Next have students put these words in a sentence: woman dog in a blue dress caught the the.</li> <li>Review student answers and write complete sentences on the board. Ask what the phrase <i>in a blue dress</i> modifies, and confirm that unless it is circus, it would be the woman, not the dog, in a blue dress. Explain that this is an opportunity for a misplaced modifier.</li> <li>Write the sentence <i>You promised on Monday you would play basketball with me</i>. Ask students to identify whether this sentence means that the promise was made on Monday or whether the basketball encounter was to occur on Monday. Use this sentence to discuss the difference between</li> </ol> |                       |

writing and speaking. In speaking you can easily clarify what you mean. But in writing, it is ambiguous.

- 7) Write this sentence on the board: *Driving down the street, the dog jumped out from nowhere.* Ask students who was driving? Explain that this is an example of a dangling modifier. Ask students for suggestions for how to fix the sentence. (I was driving down the street when a dog jumped out from nowhere.)

#### **Guided Practice**

- 8) Divide the class into pairs. Have each person in each pair write five sentences with misplaced or dangling modifiers, and then have them switch and have the other person fix the misplaced modifier.
- 9) Have each pair share its funniest sentences with the class and explain how they were corrected.

#### **Independent Practice**

- 10) Have students complete the Independent Practice with Misplaced and Dangling Modifiers.

#### **Closing Activity**

- 11) Discuss the potential miscommunications or any miscommunications students have encountered with misplaced or dangling modifiers in text messaging or emails.

#### **Advanced Learner**

**Materials Needed:** Notebook; pens and pencils

#### **Procedure:**

- 1) Have students write a humorous dialog or poem based on misunderstanding misplaced or dangling modifiers
- 2) Have them present their work to the class.

#### **Struggling Learner**

**Materials Needed:** Newspaper articles

#### **Procedure:**

- 1) Work with students to write a joke like the elephant in the pajamas joke that is based on misplaced or dangling modifiers.
- 2) Then have students work individually to write three jokes on their own.
- 3) Review and discuss the jokes, and have them present them to the class. Then have them complete the Independent Practice with Misplaced and Dangling Modifiers.

**\*see supplemental resources**

**Math Lesson:** Domain and Range

**Grade Level:** 7

**Lesson Summary:** Students find the domain and range for different functions. Students graph functions to see the domain and range. Advanced students work on finding functions to fit a given domain and range. Struggling students work with a small number of values for the domain and find the range that corresponds to it.

**Lesson Objectives:**

**The students will know...**

- that the domain determines the range.

**The students will be able to...**

- identify the domain and range of a function.

**Learning Styles Targeted:**

x Visual      x Auditory      Kinesthetic/Tactile

**Pre-Assessment:**

Use this quick assessment to see if students understand domain and range.

- 1) What is the domain and range for this function:  $y = 2x + 1$ ?

**Whole-Class Instruction**

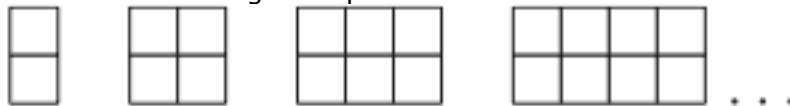
**Materials Needed:** PowerPoint Presentation\*, graph paper

**Procedure:**

**Presentation**

- 1) Use the pre-assessment to discuss domain and range.
  - The domain is all values for the independent variable (usually  $x$ ) that determine the  $y$ -values. It is the input for a function.
  - The range is all of the values for the dependent variable (dependent on the input,  $x$ ), and is usually the  $y$ -values. It is the output of the function.
  - For many functions, like the one in the pre-assessment, the domain and range are all real numbers.

- 2) Discuss the following example:



Step 1

Step 2

Step 3

Step 4

- Here, the number of blocks is a function of the step number.
- The range is the step number, which is all counting numbers.
- The domain is positive even numbers.

**Guided Practice**

- 3) Have students work to complete the guided practice slides from the PowerPoint Presentation.
- 4) Discuss what students found and strategies they used (such as graphing).

**Independent Practice**

- 5) Have students work to complete the independent practice slides from the PowerPoint Presentation.

**Closing Activity**

6) Ask students to imagine prices for a tour group: 1–4 people cost \$10 each, 5–10 people cost \$8 each, 11–20 cost \$6 each, and groups over 20 cost \$5 each. What is the domain and range? (The domain is counting numbers, and the range is the different whole number dollar amounts.)

**Advanced Learner**

**Materials Needed:** grid paper and pencils

**Procedure:**

- 1) Ask students to describe a function where the domain and range are all real numbers.
- 2) Students will respond with any number of functions such as  $y = 4x + 2$ .
- 3) Ask students to find a function where the domain is all real numbers, but the range is positive numbers and zero (functions such as  $y = |x|$ ).
- 4) Have students work in groups, choosing different domains and ranges and trying to find functions for them. Students may graph the functions to help see the domain and range.
- 5) Discuss what students found and strategies that they used.
  - Students may see that absolute value or even numbered exponents will lead to a range of positive numbers.
  - A function where  $x$  is in the denominator will restrict some values of  $x$ .

**Struggling Learner**

**Materials Needed:** grid paper and pencils

**Procedure:**

- 1) Ask students what the range is for  $y = 2x$ , if the domain is 1, 2, 3, 4, or 5.
- 2) Explain that we can define the domain any way we choose, and it will still determine the range. In the example, the range is 2, 4, 6, 8, and 10. The domain and range can be shown in an input/output table:

|                             |   |   |   |   |    |
|-----------------------------|---|---|---|---|----|
| <b>Domain (x)<br/>Input</b> | 1 | 2 | 3 | 4 | 5  |
| <b>Range (y)<br/>Output</b> | 2 | 4 | 6 | 8 | 10 |

- 3) Have students work in pairs writing different linear functions and finding the range if the domain is 1, 2, 3, 4, and 5.
- 4) Discuss what students found and strategies that they used.
- 5) Ask students what would happen in their examples if the domain could be any number (the range could also be any number).

**\*see supplemental resources**

**Lesson Title:**

Real Numbers

**Grade Level:**

8

**Lesson Objectives:**

- Students will be able to identify the set of numbers to which a number belongs.

**Learning Modalities Targeted:** Visual Auditory Kinesthetic/Tactile**Warm-Up:**

- Project several problems of changing fractions to decimals and decimals to fractions. Give students time to answer each one and reteach where necessary.

**Materials Needed:** notebook paper, writing utensils, [Teaching Points](#), cardboard signs, index cards, poster or chart paper, sticky notes, Internet access

**Procedure:**

1. Go through pages 1-5 of the Teaching Points with students, making sure they understand all the definitions and classifications of the different types of real numbers. Be sure to go through the examples and elicit other examples from each of the students to check for understanding.
2. Select six students to each represent one of the sets of numbers. Give each of them a cardboard sign that reads a different name of the number set they are representing. Gather all students in the class together and have a stack of index cards with different types of numbers on them.



**Procedure:**

3. Have students one at a time select a card and read it aloud. Then, the students who have a sign should stand up if the number read can be a part of their set. For example, if the number 2 is read, the students with the signs Real, Natural, Whole, Integer, and Rational should stand up. Have students notice which signs are always together and which signs are not.

**Independent Practice:**

- Show pages 6-8 of the Teaching Points one at a time, and have students write down the answers on a sheet of notebook paper.

**Closing Activity:**

- Go over the answers to the Independent Practice Activity as a class.

**Advanced Learner Option****Procedure:**

1. Have students write on a sheet of paper all six number sets discussed in the lesson. Then, have them write 2 examples of each that are different from the ones presented in the lesson.
2. Now, have students determine if the following statements are true or false. If the statement is false, then students must rewrite it to make it true.
  - a. All whole numbers are rational numbers. [true]
  - b. All integers are irrational. [false; No integers are irrational.]

### Struggling Learner Option

**Procedure:**

1. Project a sheet of poster or chart paper that is divided into six sections and labeled with all the names of the different sets of numbers. Read aloud a number and have students write the number on a sticky note(s) and place it in the correct section(s) on the poster. Be sure that they know a number can belong to more than one set of numbers.
2. Next, project pages 10 and 11 of the Teaching Points. Work together to rewrite each number in the form  $a/b$  to show that it is rational.

### Extension Activities

- Have students place the four irrational numbers from page 2 of the Teaching Points on a number line at their approximation location.
- Using the Internet, have students look up the value of the irrational numbers  $\pi$  and  $e$ . Then, have them explain using paragraphs how each of these values are used in mathematics and why they are important.

### ELL Teaching Tips

- **Key Lesson Vocabulary:** **general** - classify; **academic** – real numbers, rational numbers, irrational numbers, integer, natural number
- **Partner work** – Allow students to do individual work with a partner. Let students complete the Independent Practice with a partner for added support.
- **L1 production** – Allow students to demonstrate understanding of a content task by responding in their home language or by doing preparatory work in their home language before responding in English. Let students complete the second Extension Activity in their native language. Challenge them to translate their paragraphs into English with the help of their bilingual dictionary.

**Math Lesson:** Exponents and Roots

**Grade Level:** 8

**Lesson Summary:**

The teacher leads students through reasoning about the properties of integer exponents and perfect squares and cubes. Students then apply the properties to writing equivalent expressions and finding perfect square and cube roots. Advanced students extend the lesson by solving word problems with square roots. Struggling students engage in identifying the square numbers in a famous rhyme.

**Lesson Objectives:**
***The students will know...***

- the properties of integer exponents to generate equivalent numerical expressions.
- what perfect squares and perfect cubes are.

***The students will be able to...***

- apply the properties of integer exponents to generate equivalent numerical expressions.
- evaluate square roots of small perfect squares and cube roots of small perfect cubes.

**Learning Styles Targeted:**
 Visual     Auditory     Kinesthetic/Tactile

**Pre-Assessment:**

Use this quick assessment to determine if students know what exponents and roots represent.

- 1) Write these numbers and figures on the board:  $7^2$ ,  $\sqrt{2}$ ,  $2^3$ ,  $\sqrt{16}$ ,  $3^3$
- 2) Ask students to calculate each number, and then discuss their results and reasoning. [ $7^2 = 49$ ;  $\sqrt{2} = 1.414 \dots$ ;  $2^3 = 8$ ;  $\sqrt{16} = 4$ ;  $3^3 = 27$ ]
- 3) Take note of students who do not recognize square root symbols, when to multiply or divide a squared or cubed number, or recognize that  $\sqrt{2}$  is an irrational number.

**Whole-Class Instruction**
**Materials Needed:** Show What You Know [Independent Practice](#) with Exponents, Squares, and Cubes\*

**Procedure:**
**Presentation**

- 1) Review the properties of integer exponents.
  - a. Write the equations  $2^2 \times 2^3 = \underline{\quad}$  and  $2^5 = \underline{\quad}$ . Have them evaluate the equations. [32]
  - b. Discuss the original equations and what conclusions they can draw about how you can treat the exponents. [When you multiply terms with exponents that have the same base, you can keep the base and add the exponents:  $2^2 \times 2^3 = 2^5$ ].
  - c. Have students direct you how to write the equation with variables:  $x^2x^3 = x^5$ . Encourage students to think  $x^2$  means 2 copies of  $x$  multiplied together and  $x^3$  means 3 copies of  $x$  multiplied together, so you have five copies of  $x$  all multiplied together.
  - d. Write the equation  $3^2 \times 2^3 = \underline{\quad}$  and have students prove that you cannot add exponents when multiplying when the bases are not the same.  
[ $3^2 \times 2^3 = 9 \times 8 = 72$ ;  $(3 \times 2)^{2+3} = 6^5 = 7,776$ ]
  - e. Write the equation  $3^2 \times 2^2 = \underline{\quad}$ . Have students prove that when the exponents are the same, you can multiply the bases and keep the exponent.  
[ $3^2 \times 2^2 = 9 \times 4 = 36$ ;  $3^2 \times 2^2 = (3 \times 2)^2 = 6^2 = 36$ ]
  - f. Discuss how division is the inverse of multiplication, and how that affects each of the properties. [Like bases subtract exponents; dividing different bases can't be simplified]

unless the exponents are equal:  $\frac{x^3}{y^3} = \left(\frac{x}{y}\right)^3$  ]

- 2) Review square root and cube root symbols.
- Have students draw a square and a cube as you draw them on the board. Ask students to explain why square numbers are called squares and why cubed numbers are called cubes. [One side of a square multiplied by itself forms the area of a square. One side of a 3D cube multiplied by itself two times is the volume of the cube.]
  - Have students draw  $4^2$  by segmenting their squares into 16 small squares, counting 4 squares on each side.
  - Ask students how to find perfect squares and perfect cubes by writing these expressions on the board:  $\sqrt{64}$ ,  $\sqrt[3]{512}$ . Review how to find the square and cube roots of numbers. [ $\sqrt{64} = 8$ ;  $\sqrt[3]{512} = 8$ ]

### Guided Practice

- 3) Write the following expressions on the board, and have students write equivalent expressions for each. Work together as class if students are unconfident.
- $a^5 \div b^5$   $\left[\left(\frac{a}{b}\right)^5\right]$
  - $17^2 \times 2^3$
  - $7^3 \times 3^3$   $[(7 \times 3)^3]$
  - $5^4 \times 5^6$   $[5^{10}]$
  - $p^{11} \div p^6$   $[p^5]$
  - $y^{-11} \div y^{-2}$   $[y^{-9}]$
  - $4^2 \times 4^{-5}$   $[4^{-3}]$
- 4) Have students evaluate the perfect square or cube of each of these square and cube roots.
- $\sqrt[3]{27}$  [3]
  - $\sqrt[3]{125}$  [5]
  - $\sqrt{81}$  [9]
  - $\sqrt{196}$  [14]
- 5) Review student results as a class and have students explain their reasoning.

### Independent Practice

- 6) Distribute Show What You Know Independent Practice with Exponents, Squares, and Cubes and give students five minutes to complete it.

### Closing Activity

- 7) Review the Show What You Know solutions and have students defend their reasoning.
- 8) Discuss the numbers remaining from the Pre-Assessment activity and have students reevaluate them.

**Advanced Learner****Square Root Applications****Materials Needed:** [Square Root Applications\\*](#)**Procedure:**

- 1) Divide students into pairs and distribute the Square Root Applications.
- 2) Give pairs 10 minutes to solve the problems.
- 3) Have groups compare their results and discuss any discrepancies.

**Struggling Learner****Exponents****Materials Needed:** [As I Was Going to St. Ives\\*](#) master**Procedure:**

- 1) Give students the As I Was Going to St. Ives nursery rhyme. Have them write the sevens with exponents that indicate how many wives, sacks, cats, and kits are going to St. Ives.
- 2) Review student results and have them explain their reasoning.

**\*see supplemental resources**

# Get to Know Edmentum

Adaptive curriculum, assessments, and practice proven to improve student achievement.

Learn more about [our solutions!](#)



## Individualized Learning

Realize every student journey.



## Intervention

Differentiate instruction and target student needs.



## Online Courses

Expand options. Empower Opportunity.



## Practice and Preparation

Deepen practice. Reinforce learning.



## Classroom Assessment

Turn data into action.

Liked these bundles? Learn more about the products in them!



## Study Island

K-12 standards-based practice and classroom assessment to reinforce student learning.

[START FREE TRIAL](#)



## Exact Path

K-8 assessment-driven individualized learning paths that dynamically target instruction.

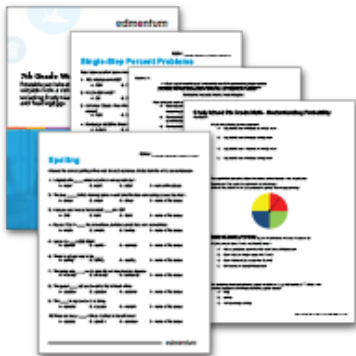
[LEARN MORE](#)



## Reading Eggs

PreK-6 online literacy solution to develop student reading and comprehension skills.

[START FREE TRIAL](#)



## Looking for additional resources?

Our lesson plan bundles are just one of many great educator resources Edmentum has to offer. Check out our free, grade-specific worksheet bundles: [http://info.edmentum.com/Worksheet-Bundles\\_Download.html](http://info.edmentum.com/Worksheet-Bundles_Download.html)

Contact us today for more information!

[www.edmentum.com](http://www.edmentum.com) - 800.447.5286

edmentum.com  
800.447.5286  
info@edmentum.com

5600 W 83rd Street  
Suite 300, 8200 Tower  
Bloomington, MN 55437

© 2018 EDMENTUM, INC.

**edmentum**<sup>™</sup>