

enVision Mathematics Grades 6-8 © 2021

Teaching a Lesson

Introduction



Hi, **enVision** Mathematics teachers!

I'm glad you want to learn more about teaching an **enVision** Mathematics lesson. Let's look at the instructional design of the program and explore the 3-step lesson structure.

Instructional Design

GRADE 7 CONTENTS (continued)

TOPIC 1 FOCUSES ON
Apply and extend previous understandings of operations with fractions.

TOPIC 1 OVERVIEW

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TOPIC 1
Rational Number Operations

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Develop content connections

Lessons

Projects

Activities

enVision Mathematics topics are designed to help students develop content connections. Each topic contains lessons, projects, and activities that are connected by a common focus.

The Topic Opener helps you introduce the Essential Question and a variety of exciting activities to your students.

Each topic contains a 3-Act Math lesson that invites students to use mathematical models to solve real-world problems by applying concepts they’re learning.

Each topic also has an **enVision** STEM Project that students can work on anytime to help them connect math concepts to the real world.

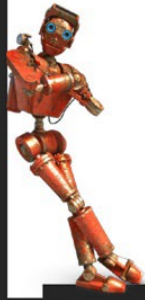
Use the Get Ready! section to activate and assess students’ prior knowledge as well as support vocabulary and language development skills.

At the start of each topic, have students make a selection in Pick a Project to give them an opportunity to apply new math concepts throughout the topic.

Next, let’s dig in to the instructional design of **enVision** Mathematics 3-step lessons.

Quick Tip

Each topic also includes Today's Challenge. Use these problems, one per day, at any point during the topic. The problems activate students' prior knowledge and use the same data set each day while gradually becoming more challenging.



Lesson
1-1

Relate Integers and Their Opposites

Go Online

🔍
🔗

Lesson Overview

Mathematics Objective
Students will be able to:

- ✓ understand how integers, their opposites, and absolute values are related
- ✓ apply this understanding to models (number lines) and use these to solve real-world problems.

Essential Understanding
An integer and its opposite are the same distance from 0 on a number line. They are on opposite sides of 0 and have a sum of 0.

In Grade 6, students:

- understand that integers can describe quantities having opposite values or directions.
- use integers to represent real-world quantities.

In this lesson, students:

- connect opposites to the concept of absolute value.
- combine opposite quantities to make 0 in a real-world context and represent the changes on a number line.

Later in this topic, students will:

- develop fluency with integers and rational numbers to solve problems in mathematical and real-world situations.

Additional Connection Students will apply their understanding of integers and their opposites when they solve real-life and mathematical problems using numerical and algebraic expressions and equations in Topic 5.

This lesson emphasizes a blend of conceptual understanding and application.

- Students extend their understanding of integers and absolute values and relate them to a number line.
- Students apply their understanding of positive and negative integers and absolute values to solve real-world problems.


Language Support

Lesson Language Objective
Explain how to relate integers, their opposites, and their absolute values.
Additional resources are available in the Language Support Handbook.

Math Anytime

Today's Challenge

Use the Topic 1 problems any time during this topic.



FOCUS

COHERENCE

RIGOR

3-Step Lessons



Teacher's Edition
GRADE 7 VOLUME 1

TOPIC 1 Rational Number Operations
TOPIC 2 Analyze and Use Proportional Relationships
TOPIC 3 Analyze and Solve Percent Problems
TOPIC 4 Generate Equivalent Expressions

enVision Mathematics

3-Step Lesson Structure

- Conceptual understanding
- Procedural fluency
- Application skills

enVision Mathematics uses a 3-step lesson structure to help your students build deep conceptual understanding, develop procedural fluency, and practice application skills.

First, review the Lesson Overview for all the important planning information to help you get ready for the day's lesson.

Step 1: Problem-Based Learning

Display sample student work

Discuss additional strategies and methods

In Step 1: Problem-Based Learning, introduce concepts by having students work on the lesson opener. Display the problem via Savvas Realize™ so you and your students can use the Desmos interactivities or Draw Pad tools to share ideas.

Using the Before, During, and After guidance in the Teacher's Edition, give students opportunities to discuss and share solution strategies.

Use the blue guiding questions to facilitate classroom conversations that help students build understanding. While students work, collect formative assessment data.

Have students share their work and discuss each other's ideas. Consider displaying the sample student work from Savvas Realize to spark conversations about additional strategies and methods.

Step 2: Visual Learning


Essential Question

Examples and Try It! exercises

Visual Learning Animation Plus
in Example 1

Explain, justify, and use
reasoning

Reach the range of learners in
your classroom



EXPLAIN
STEP 2 | Visual Learning
Go Online

ETP Establish Mathematics Goals to Focus Learning
Engage students in a discussion about the *Essential Question*. Make sure they understand how positive and negative numbers relate to zero on a number line.

EXAMPLE 1 Combine Opposite Quantities to Make 0

ETP Use and Connect Mathematical Representations

Q: How does the number line represent Alexis's movement?
[Sample answer: Moving down the number line models her movement walking down the stairs.]

Q: Why does it make sense to use 0 to represent the ground floor of the mall? [Sample answer: It makes sense to think of floors above the ground as positive and floors below the ground as negative. The number 0 would be between the positive and negative numbers.]

Q: Why is absolute value used to represent Alexis's change in floor? [Sample answer: The absolute value gives the change in floor regardless of whether she goes up or down.]

Try It! Formative Assessment

ETP Elicit and Use Evidence of Student Thinking

Q: How do you know that Xavier will end up on the ground if he climbs down 9 feet? [Sample answers: He went up 9 feet, so coming down 9 feet will "undo" the climbing. The absolute values of $|9|$ and $|-9|$ are the same, so he traveled the same distance in opposite directions.]

Convince Me!

Q: Give a real-life example that shows that the absolute values of opposite integers are equal. [Sample answer: The temperature was 0°F in the morning, warmed to 10°F that day, and returned to 0°F . At night, the temperature fell to -10°F . $|10| = |-10| = 10$. The absolute value of 10 indicates that the temperature change from 0°F was 10 degrees whether it was getting warmer or colder.]

English Language Learner

ENTERING Complete Example 1. Review the meanings of the words *ground* and *underground*.

Q: What are integers? [The integers include the whole numbers (1, 2, 3, ...), their opposites (-1, -2, -3, ...), and zero.]

Show students these numbers.

a. 5
b. $\frac{1}{2}$
c. -5
d. 0

Q: Which numbers are integers? [a, c, d]

Q: Which number is a positive integer? [5]

DEVELOPING Complete Example 1.

Q: What are two opposite integers used in the example? [6 and -6]

Help students use prior knowledge and experiences to understand meanings in English.

Q: Make a list of 5 pairs of opposite words. Draw a line down the middle of a sheet of paper and write the opposite words on either side of the line. How does this remind you of opposite numbers? [Check students' work. Sample answer: On my list, opposites are on different sides of the line. On a number line, opposites are on different sides of 0.]

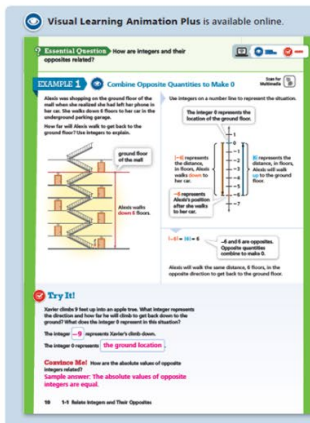
EXPANDING Complete Example 1. Help students expand and internalize vocabulary by learning and using routine classroom language.

Q: Fill in the blanks: A number and its opposite have the same _____ but different _____. [absolute value, signs]

Q: Explain in your own words the meaning of absolute value.

Q: Explain to a partner how you can use opposites to solve the problem in Example 1.

Visual Learning Animation Plus is available online



Students can access the *Visual Learning Animation Plus* by using the *BouncePages* app to scan this page. Students can download the app for free in their mobile devices' app store.

In Step 2: Visual Learning, start by discussing the Essential Question to help students focus on the learning goals of the lesson.

Then present a series of visual Examples and Try It! exercises to help students see the math and connect their thinking from the lesson opener to the new concepts in the lesson. Show the Visual Learning Animation Plus, which is part of Example 1, on Savvas Realize. Use the blue questions in the Teacher's Edition to lead a whole-class discussion.

Then have students complete the Convince Me! activity to see if they can explain, justify, and use reasoning to show their understanding.

Use the strategies in the English Language Learner, Response to Intervention, and Enrichment notes to reach the range of learners in your classroom.

Continue presenting Examples and Try It! exercises. Then bring it all together by discussing the Key Concept.

Assign the formative assessments Do You Understand? and Do You Know How? to check for understanding. Based on the results, lead students through Additional Examples as needed.


Finally, assign students independent work using the print or online Practice & Problem Solving assignments.

Step 3: Assess and Differentiate

Lesson Quiz

Create small groups

Provide differentiated instruction



EVALUATE
STEP 3 | Assess & Differentiate
Go Online

Lesson Quiz Formative Assessment


Use the student scores on the Lesson Quiz to prescribe differentiated assignments.

1 Intervention 0–3 Points **2** On-Level 4 Points **3** Advanced 5 Points

You may opt to have students take the Lesson Quiz online. The Lesson Quiz will be automatically scored and appropriate remediation, practice, or enrichment will be assigned based on student performance.

Video Tutorials

Students can access instructional tutorials using the Virtual Nerd app.



Students can also access the videos using the BouncePages app to scan exercise pages marked with this icon. Students can download both apps for free in their mobile devices' app store.


Lesson Quiz is available online.

Name: _____

1. Which of these problems can be represented by the equation $4x = 20$?

A. A store has 20 notebooks for sale. An airplane travels 20 feet each second for 25 seconds.

2. The number 54 is represented by the number line below.



What number is 10 units to the left of the number 54? Write the number in the box.

3. Write a number on a number line with the same length as the number line below. The number line has a length of 10 units. The number 5 is marked on the number line.

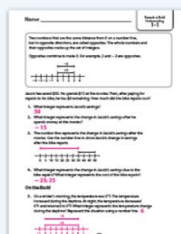
4. Write a number on a number line with the same length as the number line below. The number line has a length of 10 units. The number 5 is marked on the number line.

5. Write a number on a number line with the same length as the number line below. The number line has a length of 10 units. The number 5 is marked on the number line.

Differentiated Intervention

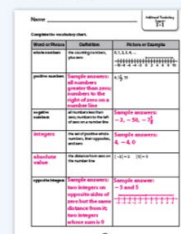
Reteach to Build Understanding **1**

Provides scaffolded reteaching for the key lesson concepts.



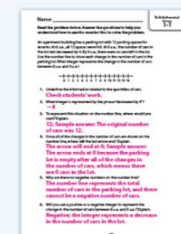
Additional Vocabulary Support **1** **2**

Helps students develop and reinforce understanding of key terms and concepts.



Build Mathematical Literacy **1** **2**

Provides support for struggling readers to build mathematical literacy.



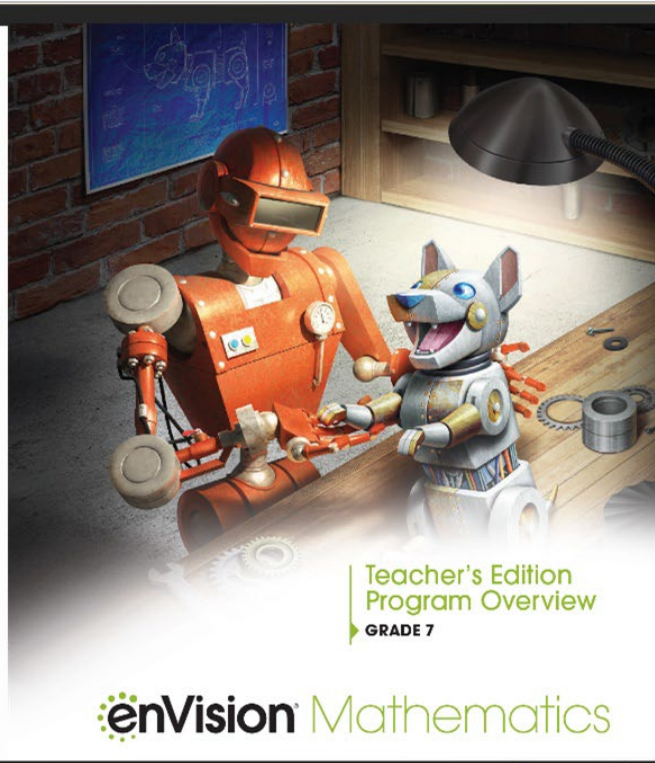
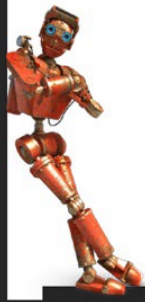
In Step 3: Assess and Differentiate, assign the Lesson Quiz in print or online. Use the results to help you create small groups so you can provide differentiated instruction.

While you work with small groups using differentiated resources listed in the Teacher’s Edition, other students can work on a variety of activities including Math Tools and Games, Pick a Project, and enVision STEM Project.

Use a variety of print and digital Additional Practice options to assign practice or homework.

Quick Tip

For more information about the instructional design of enVision Mathematics and teaching each step of the lesson, see the User's Guide section of the *Teacher's Edition Program Overview*.



Closing



Thanks for learning more about teaching a lesson with **enVision** Mathematics

Be sure to check out more resources on My Savvas Training when you're ready to learn more about **enVision** Mathematics!