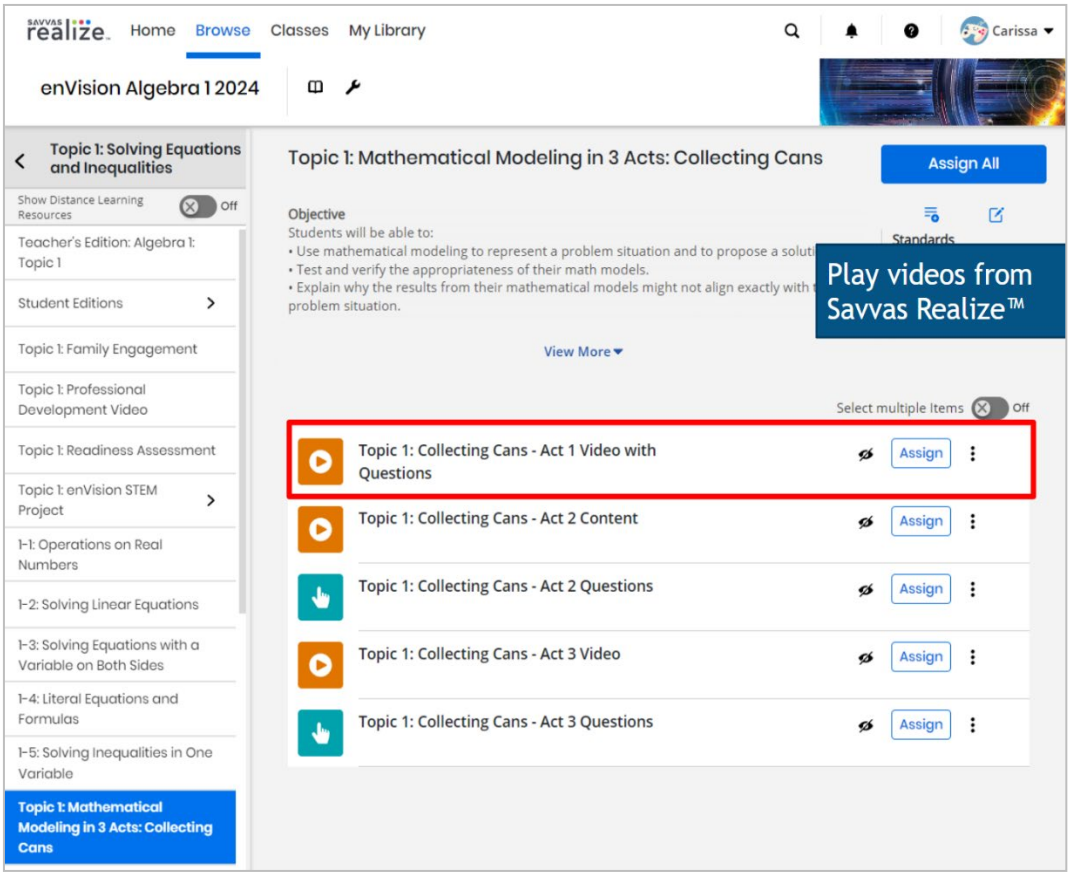
enVision A|G|A
Mathematical Modeling in 3 Acts

Introduction

Hi, **enVision** teachers!

Let's learn about Mathematical Modeling in 3 Acts lessons.
These high-interest, low-entry lessons help students learn to use mathematical models to solve real-world problems.

Planning and Pacing



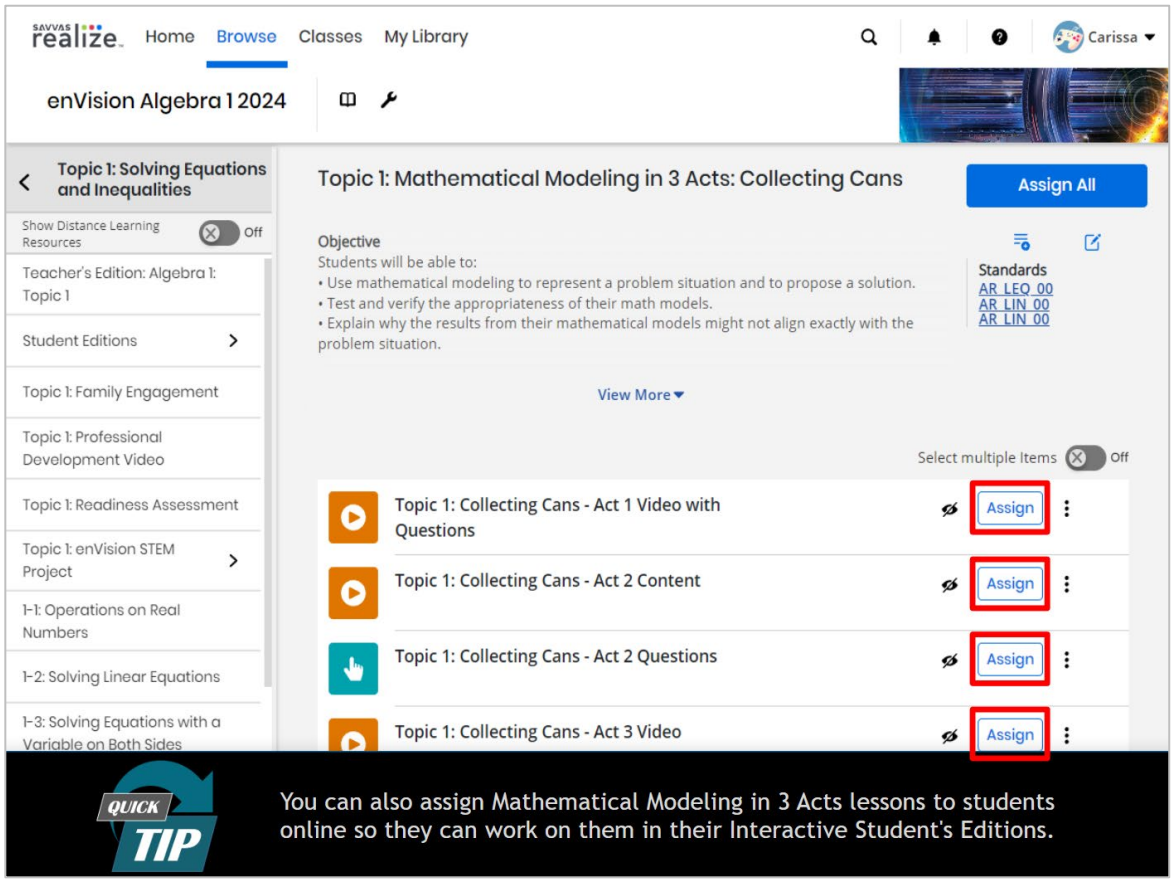
There is a Mathematical Modeling in 3 Acts lesson in every topic; plan to teach it as the lesson for the day.

The lesson may occur at the beginning, in the middle, or at the end of a topic, depending on when students will have learned the relevant content. Find pacing details in the Table of Contents of your Teacher's Edition.

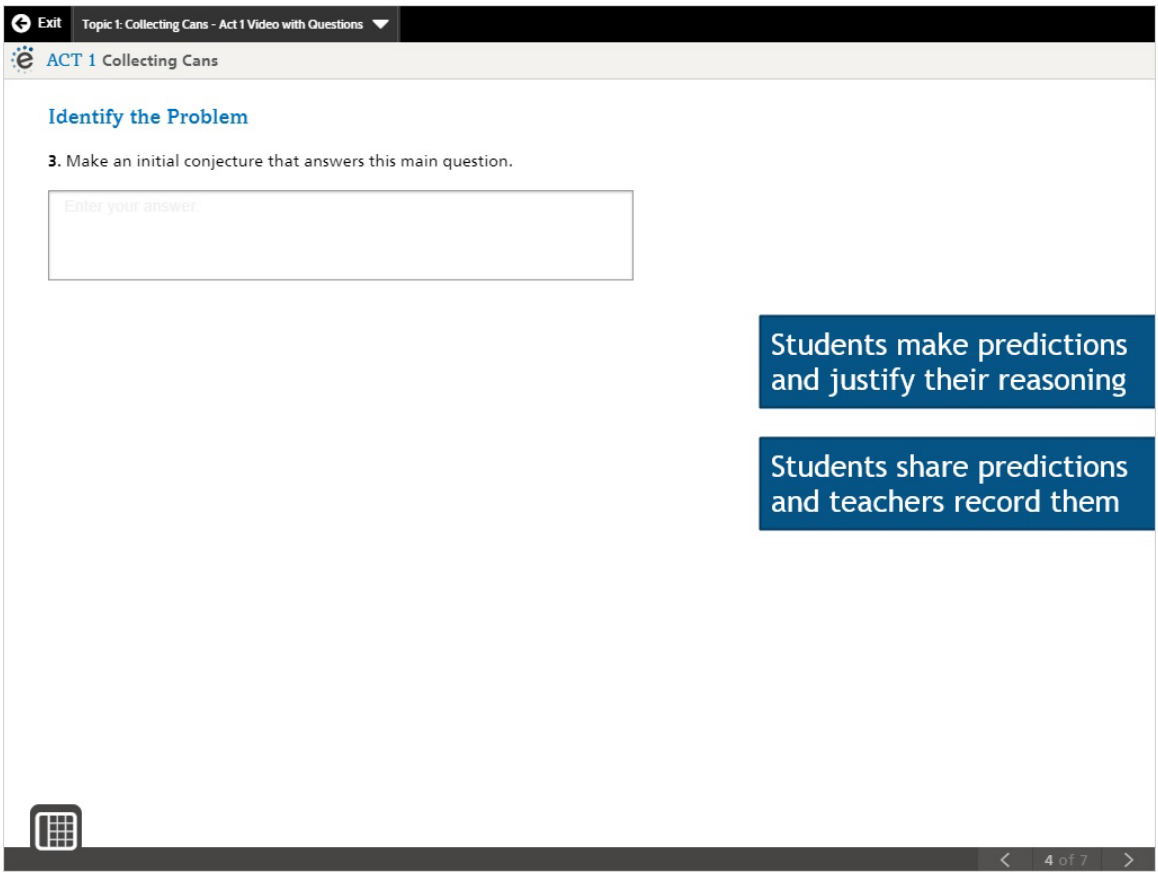
Use the Topic Overview to preview and plan for the task. Use the Mathematical Modeling in 3 Acts preview page in the Student's Edition to generate your students' interest at the beginning of the topic.

When teaching the lesson, play the videos from your computer and have students record their ideas at each step.

Quick Tip


realize
Home
Browse
Classes
My Library
Carissa
enVision Algebra 1 2024
Topic 1: Solving Equations and Inequalities
Show Distance Learning Resources
Off
Teacher's Edition: Algebra 1: Topic 1
Student Editions
Topic 1: Family Engagement
Topic 1: Professional Development Video
Topic 1: Readiness Assessment
Topic 1: enVision STEM Project
1-1: Operations on Real Numbers
1-2: Solving Linear Equations
1-3: Solving Equations with a Variable on Both Sides
Topic 1: Mathematical Modeling in 3 Acts: Collecting Cans
Assign All
Objective
Students will be able to:
• Use mathematical modeling to represent a problem situation and to propose a solution.
• Test and verify the appropriateness of their math models.
• Explain why the results from their mathematical models might not align exactly with the problem situation.
Standards
AR.LEQ.00
AR.LIN.00
AR.LIN.00
View More
Select multiple Items
Off
Topic 1: Collecting Cans - Act 1 Video with Questions
Assign
Topic 1: Collecting Cans - Act 2 Content
Assign
Topic 1: Collecting Cans - Act 2 Questions
Assign
Topic 1: Collecting Cans - Act 3 Video
Assign
QUICK TIP
You can also assign Mathematical Modeling in 3 Acts lessons to students online so they can work on them in their Interactive Student's Editions.

Act 1: The Hook



In Act 1: The Hook, play the Act 1 video. The video presents a problem situation and provides just enough information to get students thinking and talking.

Give students time to brainstorm possible questions they have about the video. Students can write their questions in the Interactive Student's Edition, in the optional *Student Companion*, or on paper.

Have students share some of their questions, and then reveal the Main Question.

Give students time to predict answers to the Main Question and justify their reasoning. Finally, ask them to share their ideas and record their predictions for the whole class to see.

Act 2: The Model

In Act 2: The Model, ask students to identify information they need to answer the Main Question.

After you collect students' ideas, reveal the information in Act 2. Ask students to discuss whether this information matches their expectations and predictions.

Then ask students to work individually to develop a model and solution to the Main Question. Encourage them to use any model to arrive at a solution that makes sense to them.

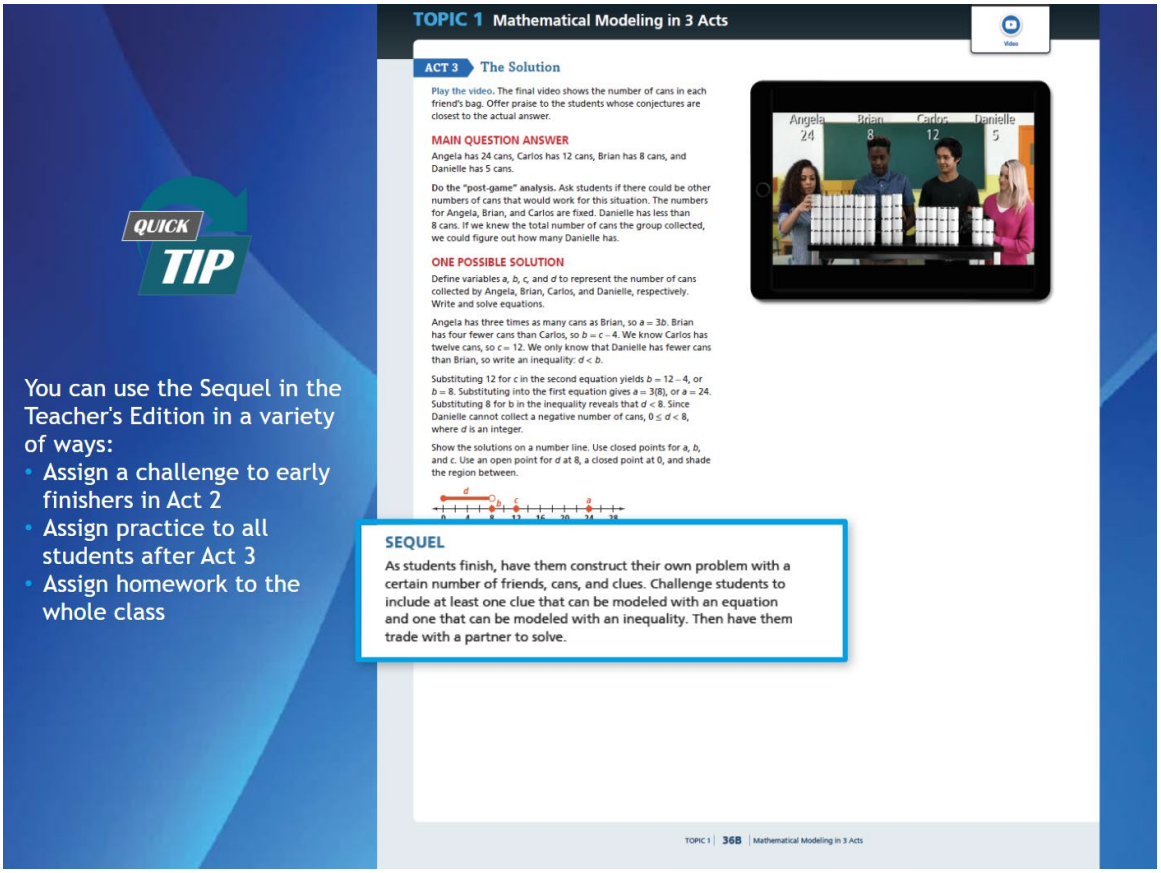
Have students share and discuss their strategies. Make sure to discuss a variety of different models and solutions.

Quick Tip

QUICK TIP

You can use the Sequel in the Teacher's Edition in a variety of ways:

- Assign a challenge to early finishers in Act 2
- Assign practice to all students after Act 3
- Assign homework to the whole class



TOPIC 1 Mathematical Modeling in 3 Acts

ACT 3 The Solution

Play the video. The final video shows the number of cans in each friend's bag. Offer praise to the students whose conjectures are closest to the actual answer.

MAIN QUESTION ANSWER

Angela has 24 cans, Carlos has 12 cans, Brian has 8 cans, and Danielle has 5 cans.

Do the "post-game" analysis. Ask students if there could be other numbers of cans that would work for this situation. The numbers for Angela, Brian, and Carlos are fixed. Danielle has less than 8 cans. If we knew the total number of cans the group collected, we could figure out how many Danielle has.

ONE POSSIBLE SOLUTION

Define variables a, b, c, and d to represent the number of cans collected by Angela, Brian, Carlos, and Danielle, respectively. Write and solve equations.

Angela has three times as many cans as Brian, so $a = 3b$. Brian has four fewer cans than Carlos, so $b = c - 4$. We know Carlos has twelve cans, so $c = 12$. We only know that Danielle has fewer cans than Brian, so write an inequality: $d < b$.

Substituting 12 for c in the second equation yields $b = 12 - 4$, or $b = 8$. Substituting into the first equation gives $a = 3(8)$, or $a = 24$. Substituting 8 for b in the inequality reveals that $d < 8$. Since Danielle cannot collect a negative number of cans, $0 \leq d < 8$, where d is an integer.

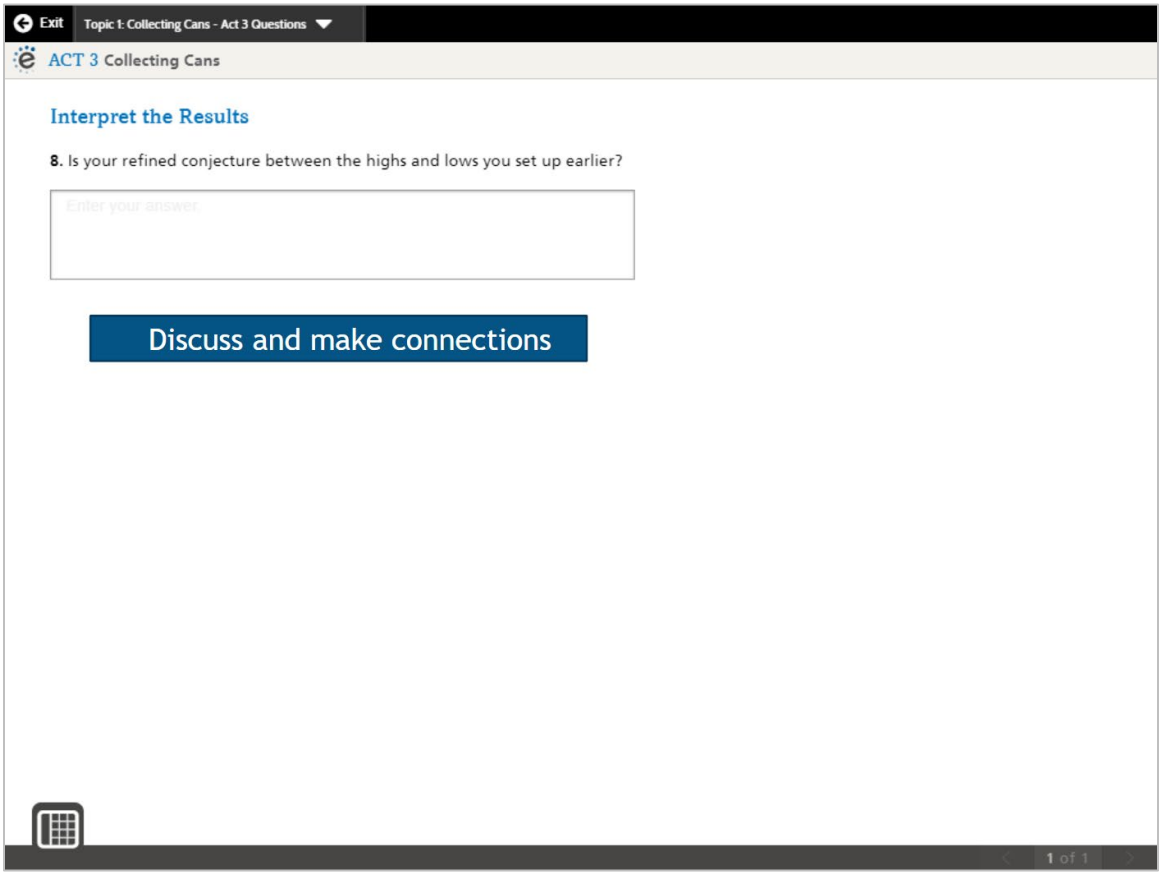
Show the solutions on a number line. Use closed points for a, b, and c. Use an open point for d at 8, a closed point at 0, and shade the region between.

SEQUEL

As students finish, have them construct their own problem with a certain number of friends, cans, and clues. Challenge students to include at least one clue that can be modeled with an equation and one that can be modeled with an inequality. Then have them trade with a partner to solve.

TOPIC 1 | 36B | Mathematical Modeling in 3 Acts

Act 3: The Solution

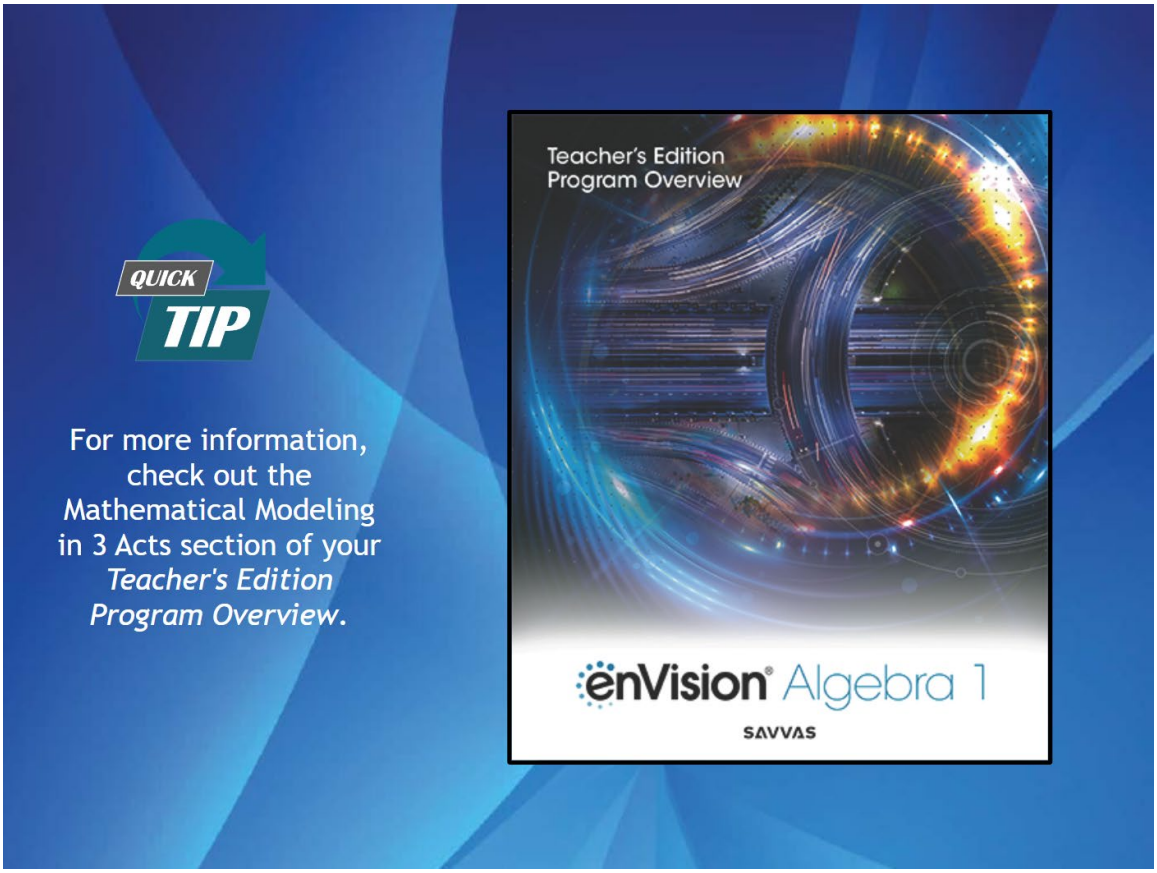


In Act 3: The Solution, play the video to reveal an answer to the Main Question.

Give students time to reflect, analyze, and explain differences between their answers and the actual solution. Lead a discussion to help students make math connections.

Finally, give students time to revise their models or work on the Sequel.

Quick Tip


QUICK
TIP
For more information, check out the Mathematical Modeling in 3 Acts section of your *Teacher's Edition Program Overview*.
Teacher's Edition
Program Overview
enVision® Algebra 1
SAVVAS

Closing

Thanks for learning more about Mathematical Modeling in 3 Acts lessons. These tasks provide an engaging way for students to learn mathematical modeling skills that they'll use throughout their lives!

Keep digging in to My Savvas Training to learn more about **enVision** Mathematics!

Copyright © 2023 Savvas Learning Company LLC All Rights Reserved. **Savvas**™ and **Savvas Learning Company**™ are the exclusive trademarks of Savvas Learning Company LLC in the US and in other countries.