

Use this 3-Act Math task any time after Lesson 9-3.

## 3-ACT MATH PREVIEW

**Page 336** This page gives students a preview of the 3-Act Math task for Topic 9. Read the robot's speech bubble with students.

**Generate Interest** Ask students what they know about fundraisers. Say: *Has anyone you know participated in a fundraiser? What sorts of fundraisers have you seen?* Have them share ideas and stories about fundraising.

## TASK OVERVIEW

**Essential Understanding** Many real-world problems can be represented with a mathematical model, but that model may not represent a real-world situation exactly.

Students use the 3-Act Math task to practice mathematical modeling. They:

- identify an important problem,
- identify the important information,
- develop a model that represents that situation,
- use the model to propose a solution, and
- test the appropriateness of that math model.

In the 3-Act Math for Topic 9, students draw on their conceptual understanding of addition and subtraction. They make use of representations and tools such as

- bar diagrams,
- number lines, and
- partial sums.

## TASK PLANNING

The following pages contain specific support for using this task with your class.

Before introducing the 3-Act Math task, consider when you would prefer students to record their answers on their Recording Sheets and when they should share their answers verbally.

## TASK CONTENT

In every task, students apply a variety of concepts and skills.

| Lesson | Concept/Skill                 |
|--------|-------------------------------|
| 7-3    | Using information from graphs |
| 8-5    | Estimating sums               |
| 9-2    | Adding three or more numbers  |

They also combine conceptual understanding with math practices and processes in every step of the task.

3-ACT MATH PREVIEW
Math Modeling
Fun Raiser

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Topic 9 | 3-Act Math Preview



Video



Activity

ACT 1: THE HOOK



BRAINSTORM

PLAY THE VIDEO WHOLE CLASS

The first screen shows a video of students counting money raised during Week 6 of a six-week fundraiser. You cannot see the amount of money the students count, nor whether they have reached their fundraising goal. Take advantage of your students’ initial reactions to watching the video. Ask *What do you notice about the video? What do you wonder?*

BRAINSTORM QUESTIONS WHOLE CLASS

**Item 1 Make Sense** Encourage students to share their questions in a class discussion. Record their questions and store them for later. Listen for interesting mathematical and *non-mathematical* questions.

To help students work on posing interesting, mathematical problems, ask *Which question do you find most interesting? Which questions could we use mathematics to answer?*



PREDICTION

POSE THE MAIN QUESTION WHOLE CLASS

Use the Main Question screen in Act 1 to pose the problem situation students will be tasked with modeling and solving.

MAIN QUESTION

Has the third grade reached its goal?

MAKE PREDICTIONS INDIVIDUAL

**Item 2** Point out that the prediction is based on an estimate of the amount of money students raised. Do not give students time to make calculations.

SURVEY PREDICTIONS WHOLE CLASS

**Construct Arguments** You can survey the class for predictions. Point out that, without any information, you expect a variety of predictions. Ask *Why do you think your prediction is the answer to the Main Question? Who has the same prediction? Who has a different prediction?*

3-ACT MATH RECORDING SHEET

Name \_\_\_\_\_

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3-ACT MATH Recording Sheet

ACT 1

1. What questions do you have?



Students may say: Why do they have so much money? What are they doing with all that money? How much money do they have?

2. Predict a reasonable answer to the Main Question. Explain your prediction.

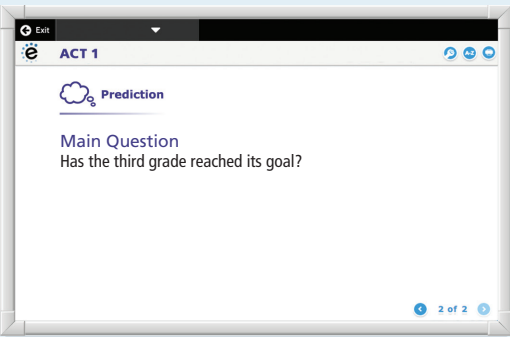


Students will say either yes or no. Check students’ explanations.

3-Act Math Recording Sheet 1 of 3

Use any time after Lesson 9-3.

CONSIDER THE MAIN QUESTION



Have students consider what they know about the scenario so far. Encourage students to think about how that information can help them make a prediction to the Main Question.

## ACT 2: THE MODEL

### INFO

#### IDENTIFY IMPORTANT INFORMATION WHOLE CLASS

**Item 3** Before showing any information, use the Information screen in Act 2 to give students time to think about what quantities are relevant to the problem situation. Ask *What information do you need to answer the Main Question?* I will only give you the information you ask for.

**Use Appropriate Tools** After discussing what information would be useful, ask *How could you get that information? How would you use it once you have it?* You can also have students complete the sentence frame “If I knew \_\_\_\_, then I could figure out \_\_\_\_.”

#### REVEAL THE INFORMATION WHOLE CLASS

Use the Image Gallery screen in Act 2 to reveal each piece of information. Record information as students identify it and keep the information where students can refer to it. Have students discuss whether this information matches their expectations.

- The amount of money raised during each of the first 5 weeks
- The amount of money each of the three classes raised during the 6th week

### MODEL

#### DEVELOP A MODEL SMALL GROUP PARTNERS

**Item 4 Model with Math** To support productive struggle, observe. If needed, ask guiding questions that elicit thinking. *Can you use the amount collected during Week 5 to predict the amount collected during Week 6?* [No; each week’s fundraising amount is separate.] *What assumption do you need to make to use a math model?* [You can assume the amount raised each week is approximately the same and use that to estimate the 6-week total.]

#### EXTEND THE TASK INDIVIDUAL

**Item 7** For early finishers, use the SEQUEL button on the Image Gallery screen to reveal the Sequel, shown on the next page. You also can assign the Sequel after Act 3 or as homework.

#### SHARE SOLUTION STRATEGIES WHOLE CLASS

**Critique Reasoning** Have students share their solution methods. If needed, use the Analyze Student Work screen in Act 2, also shown at the right.

## 3-ACT MATH RECORDING SHEET

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ACT 2

3. What information do you need to answer the Main Question?

**Students may say: the amount of money already collected, the amount of money collected during Week 6, the goal of the fundraiser**

4. Show how you can find the answer to the Main Question.

**Check students’ work. See sample solutions below.**

3-Act Math Recording Sheet 2 of 3
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## ANALYZE STUDENT WORK

**Achak’s Work**

Week 1:  $40 + 40 + 35 + 25$   
about 150

Week 2:  $20 + 50 + 40$   
about 110

Week 3:  $20 + 50 + 40$   
= 110

Week 4:  $10 + 45 + 35$   
about 100

Week 5:  $20 + 30 + 30$   
= 80

Week 6:  $35 + 36 + 36$   
about 120

Total:  $150 + 110 + 110 + 100 + 80 + 120$   
about 150

They made \$650, which was their goal.

**Jade’s Work**

| Week 1 | Week 2 | Week 3 | Total |
|--------|--------|--------|-------|
| 40     | 20     | 20     | 140   |
| 40     | 20     | 50     | 120   |
| 35     | 45     | 40     | 110   |
| 25     | 120    | 110    | 90    |
| 140    |        |        | 80    |
|        |        |        | 107   |
|        |        |        | 647   |

They made \$647, which is not their goal.

Achak says he estimated to find the total raised by the third grade. How did Achak estimate? Is his answer valid? [Achak rounded each amount. Since he rounded twice, his estimate is less accurate. His answer is close, but not exact.]

Jade says she added to find the total raised by the third grade. How did Jade use addition? Is her answer valid? [Jade added the amounts raised each week and then totaled the weeks’ amounts. Her answer is valid.]



Video



Activity

# ACT 3: THE SOLUTION

## ANSWER

### REVEAL AN ANSWER WHOLE CLASS

**Item 5** The Act 3 video shows the total amount raised during the fundraiser. Have students record this real-world answer. To support the connection between variability and mathematical modeling, ask [Why does our class have a variety of answers, and the video has only one answer?](#)

### MAIN QUESTION ANSWER

Yes, the third grade reached its goal, thanks to a final donation.

## REFLECT

### VALIDATE CONCLUSIONS WHOLE CLASS

**Item 6 Model with Math** Encourage students to discuss possible sources of error involved in using math to model this real-world situation. Accept a model as useful even if it is not perfect. Use the Reflect screen in Act 3 to ask [How useful was your model at predicting the answer? Would you change your model after watching the video? How would you change it?](#)

**Reasoning** You can also use the following question to test students' understanding of the real-world situation. [What might influence the amounts of money students raise during a fundraiser? Why do you think the amount raised during Week 6 was more than the amount raised during Week 5?](#) [During the first couple of weeks, people are eager to donate. During the final week of a fundraiser, people may donate a little more because it's the final week.]

### REVISE THE MODEL INDIVIDUAL

Look for students to revise their models based on Act 3 before developing a model for the Sequel. Students may adopt a classmate's model as a result of the discussion in Act 2.

### DISCUSS MATH PRACTICES WHOLE CLASS

If time allows, ask students the following questions to discuss how they incorporated math practices during the task.

**Model with Math** Explain how you modeled with math to represent the situation. How did doing that help you answer the Main Question?

**Attend to Precision** Explain how estimation and precision helped or didn't help you represent the situation and answer the Main Question.

### REVISIT BRAINSTORMING WHOLE CLASS

**Item 1** To acknowledge that students have important ideas, use remaining class time to return to students' list of questions. Answer as many as time allows. You can also assign interesting questions for homework, particularly for the students who asked those questions.

## 3-ACT MATH RECORDING SHEET

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ACT 3

5. What is the answer shown in the video?  
**Yes, the third grade reached its goal, thanks to the final donation by a student.**

6. Does your answer match the Act 3 video? If not, what is one reason that could explain the difference?  
**Students may say: I added incorrectly. I estimated, and since the amount was close I said "yes," which was correct, but maybe for the wrong reason.**

SEQUEL

7. Show how you would answer the Sequel.  
**Students may say: I used the colors in the thermometer to estimate. Check students' work. Look for student answers showing that Classes A and B raised about the same amount and Class C raised a little less.**

3-Act Math Recording Sheet 3 of 3

## SEQUEL

### POSE THE SEQUEL INDIVIDUAL

**Item 7** You can assign this similar problem situation involving adding three or more numbers for early finishers or as homework.

SEQUEL

Which class do you think raised the most money?

**Sequel Answer** Look for student answers showing that Classes A and B raised about the same amount and Class C raised a little less.