

Puzzle Talk Facilitation Guide

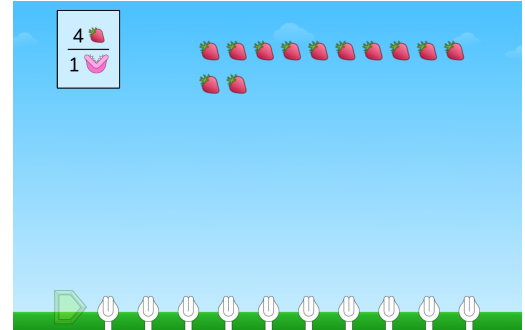


This is a guide to provide support for facilitating student thinking as teachers engage students in academic discourse around math concepts and strategies using ST Math puzzles. This talk can be done over multiple days. **Pre-work can be given to encourage students to think about the concept prior to the Puzzle Talk.** Read the [Puzzle Talks Overview](#) to learn more.

Grade Level: Eighth

Objective: Unit Rates, Tables, and Graphs

Game: Hungry Monsters



Teacher Prep

Description

- **Purpose:** Focus on how to find the rate when given the ratio. Use guiding questions for each step in the [Problem Solving Process](#) to support student thinking and the development of problem solving skills.
- **Materials Needed:** Provide students with whiteboards, [Hungry Monster Game Mats](#) in a clear plastic sleeve, dry-erase markers, and manipulatives to represent fruit.
- **Puzzle Location:** Grade 8 > Unit Rates, Tables, and Graphs > Hungry Monsters > Level 1
- **Game in a Minute:** [View video](#).
- **Duration:** Multiple days
- **Time:** May vary 10 - 20 minutes each session

Look Fors

How does the student:

- use mathematical vocabulary to talk about ratios?
- determine the unit rates when given the monsters or the fruit in the puzzles?
- apply unit rate to the ratios in the puzzles?

Puzzle Progression

Students will encounter puzzles that use ratios to determine how much fruit is needed in order to feed a monster when given the unit rate. Later puzzles present various forms of ratios and ask students to change ratios into unit rates (introducing the idea of dividing instead of multiplying), as well as find equivalent ratios. The final puzzles involve fractional fruits for whole mouths where students determine the unit rate to find equivalent ratios.



Facilitation Suggestions (This is what a student-led discussion might look like.)

This would occur over multiple days

Notice and Wonder

- Display the first puzzle from Level 1. Ask: "What do you notice about this puzzle?"
- Allow a few students to share out. Listen for ideas that might include the following:
 - "There is a ratio at the top."
 - "There are ten apples."
 - "There are white monsters at the bottom of the screen."
- Ask: "What do you wonder about this puzzle?" Allow students to share out. Listen for ideas that might include the following:
 - "What could we click on this puzzle?"
 - "What does the key in the upper left corner tell us?"

Predict and Justify

- Ask students to think individually about how they could solve the puzzle, then turn and share with a partner before sharing as a class.
- Students should provide mathematical reasoning for the idea they want to try. They can use their whiteboard or Hungry Monster Game Mat 01 to represent the puzzle. Ask students to consider what they think needs to happen in order for Jiji to move across the screen.
- List these ideas for the class to consider.

Test and Observe

- Choose one of the ideas from the class to try. Typically, a teacher might choose an incorrect answer the first time in order to allow for enhanced discussion and exploration of why Jiji was unable to cross the screen.
- Play the puzzle and ask students to observe what happens in the puzzle. *Remember to use the animation control features to replay or stop during points in the feedback to highlight important ideas.*
- Based on what they have learned from the feedback, ask students to choose another idea to try.
- Play the puzzle and ask students to observe what happens in the puzzle, using the animation control features and stopping when appropriate.
- Consider:
 - "How many apples did each monster eat?"
 - For example, the ratio at the top of the page told us how many apples each monster would eat.
 - "Using the ratio, how can we get Jiji across the screen?"



- For example, choose the number of monsters that will eat the given number of apples.
- You can use the animation controls to pause the puzzle while students check if their answer matches the puzzle on the screen. Discuss how this might provide evidence for why the solution will work or not work.

Analyze and Learn

- Continue with puzzles from Levels 1 and 2.
- Discuss ways to help Jiji across the screen. Have students continue to model on their game mat. Ask:
 - “What is happening in this puzzle?”
 - For example, how many apples does each monster eat?
 - How is this puzzle like the last one we solved? How’s it different?
 - Can we use what we learned in the last puzzle to help us with this one? If so, what?
 - “How could we find the number of monsters we need?”
 - For example, students might use their whiteboards to attempt to solve the puzzle.
 - Tie in the vocabulary of unit rate and how this helps to find how many monsters or fruit we need.
- You can use the animation controls to replay and examine what happens in the puzzle.
 - If the puzzle was correct, discuss why the strategy used was successful.
 - If the puzzle was incorrect, analyze what happened and consider how to adjust the strategy to try again.

Connect and Extend

- Continue with puzzles from other levels within *Hungry Monsters*.
 - “How are these puzzles different from those we’ve solved before?”
 - “How do we know how much fruit is needed?”
 - “Before we begin this puzzle, can you predict how much fruit is needed?”
- Give students a ratio, such as 2:3. Ask students to draw a *Hungry Monsters* puzzle that could represent this ratio on their [Hungry Monster Game Mat](#). Note that with this ratio, it is not defined which number represents monsters and which number represents fruit. This provides an opportunity for discussion and determining whether the puzzles drawn by students could be described using the given ratio.