



Pie Monster Addition

First Grade

Addition and Subtraction Situations with Unknowns

4 levels

Probing Questions

- What are you supposed to do in this puzzle?
- How do you know how many to select?
- What happens after you choose?

Stop the animation

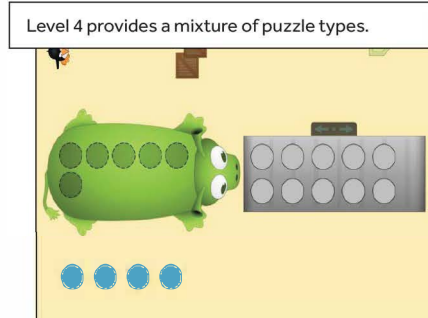
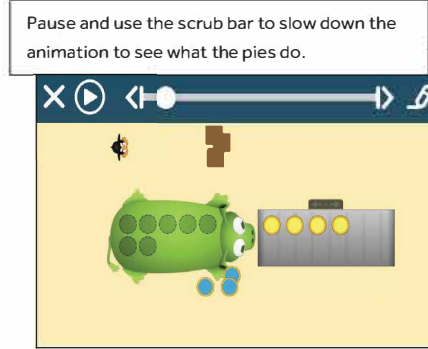
These visual puzzles move the unknown to various positions. It develops a different understanding of subtraction than just "take away." The missing addend and/or comparison of the pies on the table to the pies on the monster will deepen students' understanding of these operations and of equality.

What strategies are being used?

Project selected puzzles from level 4, asking students to draw and then explain how they solved them. By sharing and then comparing different strategies such as counting on and subtracting, students will begin to see the inverse relationship between addition and subtraction.

ST Math

© 2023 MIND Education. All rights reserved.



Addition and Subtraction Situations with Unknowns 1



Pie Monster Subtraction

First Grade

Addition and Subtraction Situations with Unknowns

4 levels

Probing Questions

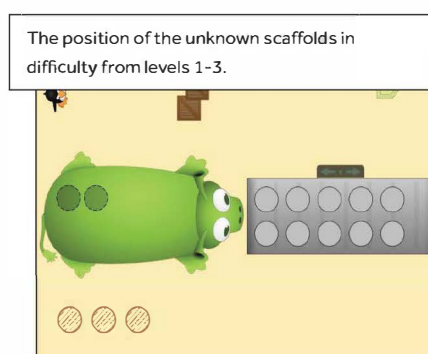
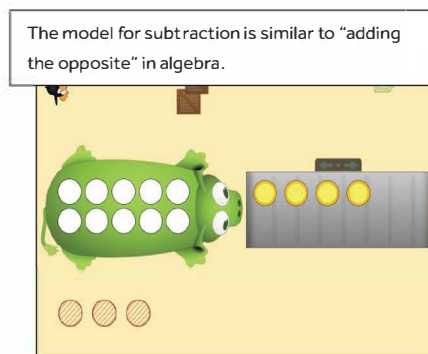
- What do the red circles with the line mean?
- How is this game different than the other Pie Monster game?
- How do you know how many to select?
- What will you see after you click?

What's Important Here?

Moving the unknown in a subtraction equation is challenging. Ask students to explain their reasoning and to express the situation as a word problem. Later, let students connect the visual situations to the symbolic expressions and equations.

Supporting Struggling Students

Level 3 is a start unknown problem. Try using the game mat with two-color chips. Ask questions like, "How many would you need so that if you took away ____, there would be ____ left?" Have the student model the action, trying out potential solutions and adjusting the thinking based on the feedback.



Addition and Subtraction Situations with Unknowns 2

ST Math

© 2023 MIND Education. All rights reserved.



Push Box

First Grade

Addition and Subtraction Situations with Unknowns

4 levels

Probing Questions

- How do you know how to solve this puzzle? How do you know how many blocks to choose?
- How are you figuring it out?

Something to Think About

Note how the visual model in this game supports direct modeling. It presents both a missing addend in level 1 and a take from model in level 2. Level 4 provides the most insight into student thinking as they wrestle with two unknowns.

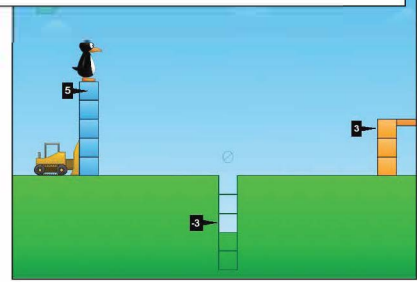
Classroom Connection

Play 1 or 2 puzzles from level 4 in class. Ask students to explain how they found their solutions. Compare different solutions and then explore all possible solutions for the same puzzle. As students are working with two unknowns, discuss how the choice for the first number of blocks affects the second choice.

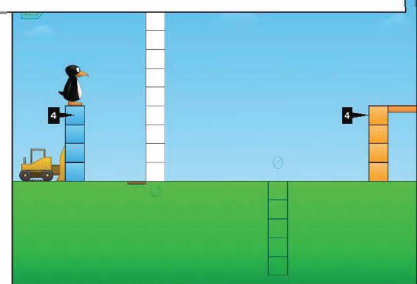
ST Math

© 2023 MIND Education. All rights reserved.

Note how the part taken away is shown as below the ground.



Level 4 has two unknowns.



Addition and Subtraction Situations with Unknowns 3



Push Box Symbolic

First Grade

Addition and Subtraction Situations with Unknowns

4 levels

Probing Questions

- How do you decide how many creatures to choose?
- What does the puzzle show you? What do you need to find out?

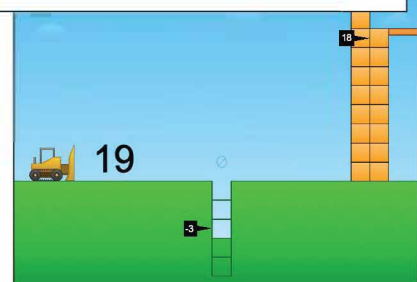
What Strategies are Being Used?

Watch to see how students solve these puzzles. Which students are still counting all? Are any students composing or decomposing to make use of 5s or 10s in problems like $13 - \underline{\quad} = 9$? Some students may use the visuals to help them find the solution and may notice that the blocks will be stacked no more than 10 high. Then they can see the number as 10 and $\underline{\quad}$ more.

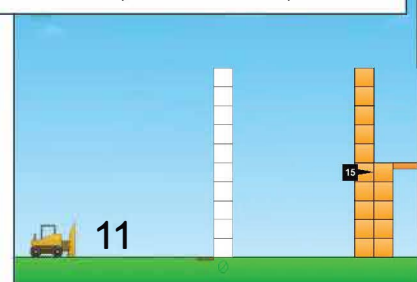
Classroom Connection

Students can use the game mat to model a puzzle and then write an equation to represent the situation. Ask students to identify what each number in the equation represents. Comparing the height of the two towers at the end of the puzzle can help define equality.

Note how subtraction is represented as a hole in the ground.



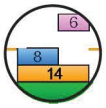
Levels 3 and 4 provide a mixture of problems.



ST Math

© 2023 MIND Education. All rights reserved.

Addition and Subtraction Situations with Unknowns 7



Missing Addend

First Grade

Addition and Subtraction Situations with Unknowns

3 levels

Probing Questions

- How do you decide how many creatures to choose?
- What does the puzzle show you? What do you need to find out?

What Do the Standards Say?

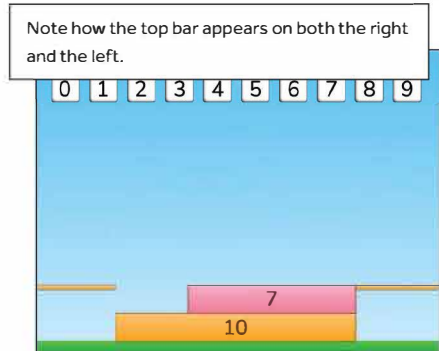
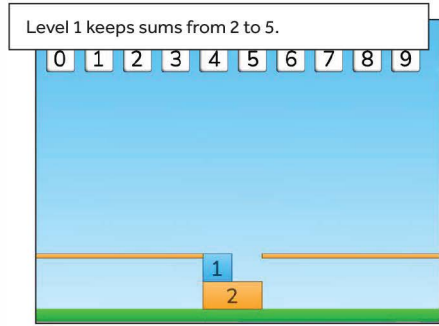
This model is similar to the tape diagrams and bar models referenced in the standards.

What's Important Here?

This game is near the end of the objective since there is little support to solve this visually. Take notice of students who reason that since there is only space for a small bar, the number they choose must be less than the number that is already there. This is also a good opportunity to discuss number relationships and decomposing numbers.

ST Math

© 2023 MIND Education. All rights reserved.



Addition and Subtraction Situations with Unknowns 8