



Pie Monster Addition

First Grade

Addition and Subtraction 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.

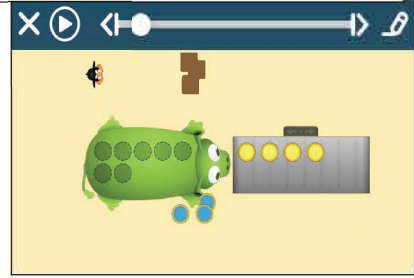
What strategies are being used?

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.

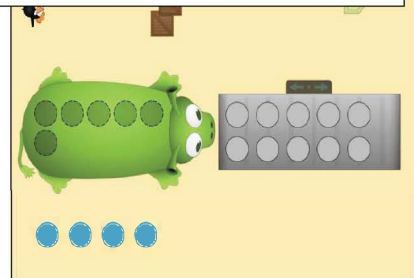
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Pause and use the scrub bar to slow down the animation to see what the pies do.



Level 4 provides a mixture of puzzle types.



Addition and Subtraction with Unknowns



Pie Monster Subtraction

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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?

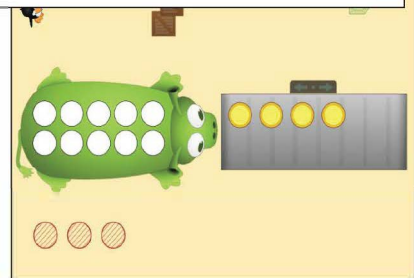
What's Important Here?

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.

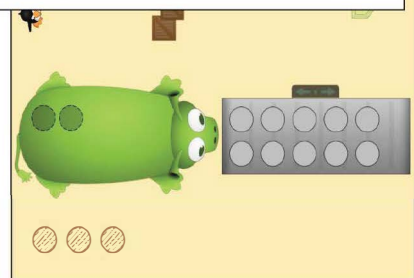
Supporting Struggling Students

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.

The model for subtraction is similar to "adding the opposite" in algebra.



The position of the unknown scaffolds in difficulty from levels 1-3.



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Push Box

First Grade

Addition and
Subtraction 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?

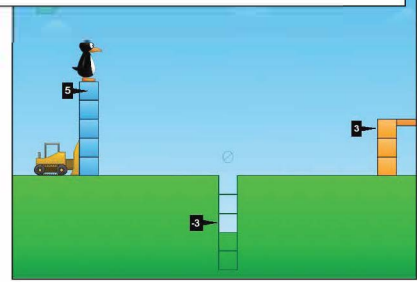
Something to Think About

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.

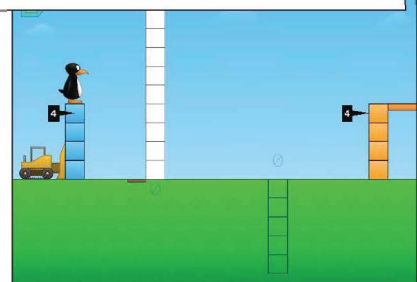
Classroom Connection

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.

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



Level 4 has two unknowns.



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