Share a student success story based on a Mathematics Achievement Academy activity, strategy, or tool.
Welcome!

• Intended outcomes

• Learning intentions and success criteria

Resources and Materials

Texas Gateway
http://www.texasgateway.org/

• Mathematics TEKS: Supporting Information
• Vertical Alignment Charts

Norms

• What norm is being modeled?
• Is this a participation norm, discourse norm, or mathematics norm?
Norms

• How will we hold each other accountable for the norms?
• What is a cue we can use to remind each other of the norms if a norm is broken?

Academic Vocabulary

Co-Craft Questions
Mathematical discourse
Student voice
Problem-solving model:
  • Analyzing given information
  • Formulating a plan
  • Determining a solution
  • Justifying the solution
  • Evaluating the problem-solving process and the reasonableness of the solution

Mathematics TEKS K(1)(B)
Setting the Stage for Problem Solving

The Elephant Challenge

Flexible
Persistent
Engaged
Setting the Stage for Problem Solving

- What experiences with problem solving might the pictured student(s) bring to school?
- What insight might be provided by these experiences?

Setting the Stage for Problem Solving

Problem solving means engaging in a task for which the solution method is not known in advance. In order to find a solution, students must draw on their knowledge, and through this process, they will often develop new mathematical understandings. Solving problems is not only a goal of learning mathematics, but also a major means of doing so.

NCTM, 2000, p. 52

Setting the Stage for Problem Solving

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<tr>
<td>NCTM (2016)</td>
<td>Chapin, O’Connor, and Anderson</td>
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Setting the Stage for Problem Solving

K(1)(B) The student is expected to use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.

Mathematics TEKS, 2012

Analyzing Given Information

K(1)(B) The student is expected to use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.

Mathematics TEKS, 2012
Analyzing Given Information

What student responses might we anticipate?

What questions might we ask to support analyzing given information?

- What does the word _____ mean?
- How many _____ are there?
- What are you trying to figure out?
- How is this different from or the same as yesterday's task?
- How might you model this problem?

Co-Craft Questions
Co-Craft Questions

There were 8 birds in the tree.

Two of the birds flew away.

How many birds are in the tree now?

Co-Craft Questions

Ms. Garcia ate the 2 donuts with pink icing.

How many donuts are still in the box?

Co-Craft Questions

Practice makes perfect.
Analyzing Given Information

How can you support students in analyzing given information?

What is the students’ role in analyzing given information?

There were 3 students on the rug. Later, 6 more students came to join them. How many students are on the rug now?

- Who can tell me what you saw in your movie as I read the story?
- Did anyone see anything else?
- What action did you see in your movie?
What supports modeled today might benefit students who are learning to analyze given information while learning English?

Formulating a Plan or Strategy

K(1)(B) The student is expected to use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.

Mathematics TEKS, 2012
Formulating a Plan or Strategy

What student responses do we anticipate?

What questions might we ask to prompt students to formulate a plan or strategy?

Formulating a Plan or Strategy

• What action does this problem make you think about?
• What tools could you use to model this action?
• What should you do first? Next? Last?
• What is your plan?

Formulating a Plan or Strategy

Max has 4 red cups. He has 5 blue cups. How many red cups and blue cups does he have in all?
Formulating a Plan or Strategy

How can you support students as they formulate a plan or strategy?

What is the students' role in formulating a plan or strategy?

There were 6 ducks in the pond. Three of the ducks flew away. How many ducks are in the pond now?

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Formulating a Plan or Strategy

What supports modeled today might benefit students with receptive or expressive language needs as they formulate a plan or strategy?
K(1)(B) The student is expected to use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Mathematics TEKS, 2012

Determining a Solution

- What student responses do we anticipate?
- What questions might we need to ask to support determining a solution?
- What questions might we need to ask to support determining if the solution is reasonable?

Determining a Solution

- Is your plan working? How do you know?
- Do you need to use a new tool?
- Does your solution tell you ________?
- How do you know your solution is not too large or too small?
Determining a Solution

How can you support students in determining a solution?

What is the students’ role in determining a solution?

I have 2 red counters and 5 yellow counters. How many red and yellow counters do I have?

1     2     3    4    5     6    7

Determining a Solution

I have 2 red counters and 5 yellow counters. How many red and yellow counters do I have?

1     2    1     2    1     2    1

Determining a Solution

I have 2 red counters and 5 yellow counters. How many red and yellow counters do I have?

1     4    3     2    7     6    5
I have 2 red counters and 5 yellow counters. How many red and yellow counters do I have?

7  6  5

2  3  4  5  6  7

Determining a Solution

6 plus 2 is _____.

7 minus 5 is _____.

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Determining a Solution

What supports modeled today might benefit students as they determine a solution to a problem?

Determining a Solution

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Mathematics TEKS, 2012