Quick-Sketch Story Problems

Today's Learning

Students solve change unknown story problems. They read, listen to, and retell story problems before representing them with quick sketches and expressions. Partners solve a problem and share their work before going to math stations.

Content Target: I can solve 1-step addition and subtraction story problems. (2.OA.1)

Practice Target: I can talk with others about what math problems mean and show them with numbers, words, and pictures. (MP.2)

Materials

Plinks (chain of 100)
Story Problem Frame Examples 1 & 2 (for display)
Story Problem Frame Example 2 (for students)
Story Problem Frames (for students)

Preparation

Before the warm-up, hang the chain of 100 plinks horizontally near the whole-group area.

Language Opportunities

Word Wall

<table>
<thead>
<tr>
<th>greater than</th>
<th>less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 &gt; 6</td>
<td>5 &lt; 6</td>
</tr>
</tbody>
</table>

Assessment Opportunities

Informally observe as students solve change–unknown story problems. Watch for students to count on by 5s and 10s to solve the problem and to show their work through drawings and numbers. If students count by 1s, encourage them to use 10s and 5s for more efficiency as they solve.
During the Work Time, observe students as they:

<table>
<thead>
<tr>
<th>Make sense of the problem</th>
<th>Reason informally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observe for evidence of students’ ability to:</td>
<td>Observe for evidence of students’ ability to:</td>
</tr>
<tr>
<td>• Restate the problem with their own words or in a new context,</td>
<td>• Enact a viable solution path,</td>
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<tr>
<td>• Describe the known and unknown information,</td>
<td>• Apply operations to solve,</td>
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<tr>
<td>• Act out the problem physically or with manipulatives,</td>
<td>• Symbolically represent the relationship between quantities,</td>
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<tr>
<td>• Draw pictures/sketches, and/or write expressions,</td>
<td>• Count on by 5s and 10s to solve the problem</td>
</tr>
<tr>
<td></td>
<td>• Produce the correct answer.</td>
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</tbody>
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**Warm-Up: How Many 5s Can We Make?**

1. Draw students’ attention to the chain of 100 **plinks** and pair-share: *What do you notice?* (There are a lot of plinks; there are still 100). *How many groups of 10 are in the chain?* (10 groups)
2. Chorally count to confirm there are 10 groups of 10.
3. Propose taking the chain apart and reconfiguring it so all the links appear in alternate groups of 5. Ask: *Will there still be 100 plinks? Why or why not?*
   a. Pair-share: *How many groups of 5 will it be possible to make?*
   b. Record students’ responses on the board.
4. Detach the first 2 groups of 10 from the chain. Choose two students to reconfigure the 2 tens into groups of 5 in alternating colors.
   a. Ask: *How many groups are there?* (4 groups)
   b. Invite students to revise their answers based on the information.
5. Invite students to continue reconfiguring chains of 10 into 2 sets of 5.
6. Chorally count to confirm there are 20 groups of 5. Count by 5s to confirm the total.
Work Time: Solving Change Unknown Story Problems

1. Introduce today’s lesson.
   a. Read both learning targets aloud: I can solve 1-step addition and subtraction story problems; I can talk with others about what math problems mean and show them with numbers, words, and pictures.
   b. Tell students they will discuss story problems and solve them using quick sketches, numbers, and words.
2. Display Story Problem Frame Example 1 (p. 6, below) and read the problem aloud.
   a. There were 40 beetles together at a party. Some more beetles join them later. Now there are 65 beetles at the party. How many beetles came later?
3. Point out that 40 beetles were at a party. In a separate space on the board, briefly model increasingly efficient quick sketches to represent groups of 10.
   a. Remind students that beetles like to organize themselves into groups of 10. Dramatize the laborious nature of drawing the individual beetles in a ten-frame.
   b. Propose a more efficient drawing: draw another 10-frame, this time drawing a single dot to represent each beetle.
   c. Propose an even more efficient quick sketch: Draw a rectangle and label it “10.”
   d. Draw 1 more box, totaling 40 in all.
   e. Chorally count by 10s to confirm there are 40 beetles represented.

Increasingly efficient quick sketches to show 40
4. Reveal and invite students to read the Questions & Responses aloud.
   a. Display the **math language card for change** and review the meaning of change (to make different in some way) by briefly soliciting examples from students of things that change (e.g., babies change as they grow; people change their clothes/hairstyle; trees change with the seasons).
   b. Review the meaning of **result** by referring to the **math language card** and sharing synonyms (answer; solution; outcome).
   c. Review the meaning of **unknown** by referring to the **math language card** and sharing a simple definition (the part of the problem we’re trying to figure out; the part we don’t know).

5. Work through Story Problem Frame Example 1, using the questions and responses as a guide to make sense of the problem.
   Questions:
   - What happened at the beginning?
   - What happened next? What changed?
   - What was the result?
   - What part of the problem is unknown? What did we have to figure out?
     
     a. Have students retell the story to a partner.
     b. Invite students to ask you each question.
     c. In response, model thinking aloud.
     d. Write the equation in the space at the bottom of the Story Problem Frame.
        
        \[ 40 + 25 = 65 \]
6. Display **Story Problem Frame Example 2** and distribute copies of the printmaster to students. Invite them to work with a partner to make sense of the problem and use the questions and responses to fill in the frame.

7. Prompt students to solve. Circulate and identify 3–4 pairs of students using different strategies to share their work with the class.
   a. Include examples of work from students with limited English proficiency, and support them in describing their strategies to the class.
   b. If possible, include a student who counted on by 5s and 10s.

8. Invite 3–4 pairs of students to share their work and explain how they solved the problem. Document student strategies on the board as students verbalize their solutions.

9. Invite students to compare the strategies, focusing on their efficiency.
   a. Pair–share: *What is similar about these strategies? What is different?* (Responses will vary.)
   b. Review the meaning of *efficient* and provide a sentence starter as needed. (*_____* is an efficient strategy because *_______*.)
   c. Pair–share: *What is efficient about these strategies?* (Responses will vary.)

10. Direct students to find the **Story Problem Frames, Unit 1 Set A** pages in their student books and to spend about 10 minutes solving the problems alone or with a partner before going to math stations.

### Math Choice Time

Invite students to spend 15 minutes at math stations of their choice before following your established cleanup routine.

### Closing

1. Review today's mathematical practice learning target: *I can talk with others about what math problems mean and show them with numbers, words, and pictures.*
   a. Pair–share: *How did you meet this learning target through today’s work?* (Read the problem out loud; talked to my partner about how to solve the problem; used the question and response prompts to help me think of what to say.)

2. Preview tomorrow's work: continuing to solve story problems using numbers, pictures, and words!
### Story Problem Frames Example 1

<table>
<thead>
<tr>
<th>Beginning</th>
<th>+ or -</th>
<th>Change</th>
<th>=</th>
<th>Result</th>
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</table>

There were 40 beetles together at a party. Later, some more beetles joined them. Now there are 65 beetles at the party. How many beetles came later?

### Story Problem Frames Example 2

<table>
<thead>
<tr>
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<th>+ or -</th>
<th>Change</th>
<th>=</th>
<th>Result</th>
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</table>

60 beetles are together in the grass. Some beetles leave the group. Now there are only 35 beetles in the grass. How many beetles left the group?
1. There were 85 beetles taking a trip together. Some of the beetles went home. That left 60 beetles still on the trip. How many beetles went home?
2. There are 20 beetles working together. Some more beetles come to help them. Now there are 70 beetles. How many beetles came to help?