

Super SHARING STRATEGIES

Using CRISS Strategies to Solve Story Problems

As an education consultant and CRISS District Trainer, I work with districts to help them with their professional development. Many of our districts in Iowa train their entire staff with CRISS, Pre-K—12. I frequently work with the primary grades because of my teaching background in elementary education. Primary teachers often ask the questions, “Which strategies can I use in my classroom?” and “What does this look like in math?” The following lesson met the needs of these teachers.

Tinelle Gimm, a second grade teacher in Earlham, Iowa, originally developed this math lesson and shared it with me. I made some adjustments to the lesson in order to meet my needs for professional development opportunities. The lesson objective is focused on helping students with problem solving, while meeting the National Council of Teachers of Mathematics standards <<http://standards.nctm.org/>>.

Many of our students have difficulty solving word problems. They may have difficulty reading the problem, comprehending what is being asked of them, labeling the final answer, or understanding how to figure out what math operations to perform to get the correct answer. By working in small groups and using a content frame to organize the information, our students find success in solving word problems.

Teachers: Sue Ford/Tenille Gimm

Class/Grade/Subject: K-2 Math

Lesson Title: Primary Math Strategies—CRISS alignment

Enduring Understandings:

Process: Students will learn to use Content Frames to organize information

Content Standard: Students will solve and explain word problems using various operations

Assessment: Completion of a Content Frame

Solving a word problem

Materials: Blank Content Frames, story problem cards, envelopes for Pattern Puzzles, list of student roles, scissors, sticky notes

The instructional portion of the learning plan is divided into three sections, before (Preparing for Understanding), during (Engaging Students with Content), and after (Transforming Information).

Before . . .

Preparing for Understanding

1. **Think-Pair-Share.** Ask students to think about the following prompt and write their response on a sticky note.
What is the hardest part of solving a story problem in math?
Have students share their responses in pairs and then with the whole class.
2. **Content Frames.** Place students in groups of 4 or 5, and assign each student a number (1–4/5), using nametags on their tables. Explain the role of each team member. Use a sample Content Frame as you explain. Display group roles on a chart at the front of room.
 - **1s** will read the problem and assist others when needed.
 - **2s** will choose the operation and write it on the content frame in the assigned column.
 - **3s** will show work on the Content Frame in the assigned column.
 - **4s** will write the final answer or solution on the Content Frame in the assigned column.
 - **5s** will illustrate the problem on the Content Frame in the assigned column (if needed or time allows).
3. Model for students how to complete the Content Frame with a sample problem.
4. Pass out 2 different story problem cards to each group.

Note: If working as a whole group, use a laminated, enlarged Content Frame and sticky notes to complete the problems.

During...

Engaging Students with Content

1. **Content Frame.** Instruct each group to complete one Content Frame for each assigned problem. Samples of all three Content Frames are at the end of this article.
2. **Gallery Walk.** Next, provide time for a Gallery Walk where the **1s** will share with each group one of their problems and how they solved it. The rest of the group members will rotate to each of the other groups. Provide a designated signal to notify students when it is time to rotate.

Metacognition Prompt: How did the Content Frame help you learn?

After...

Transforming Information

1. After the Gallery Walk, groups will get back together.
2. **Pattern Puzzle.** The **1s** will cut their group's last story problem solution apart and put the slips of paper inside an envelope, [leaving out the story problem in column one].
3. Pass the envelope to the group on the right. Each group will assemble the story problem solution. The **2s** will be recorders and the group will write a new story problem to fit the math problem and solution from the envelope. Then they create a new **Content Frame** with the problem from the envelope.
4. On a signal, pass the envelope to the next group. Repeat the process. Do this rotation 3 or 4 times, depending on the number of groups and amount of time.

Metacognition prompt: How did the Gallery Walk help you to assemble the Pattern Puzzles?

Student Response to Metacognition Question

Here are a few student responses to the questions asked during this lesson:

Background Knowledge and Purpose Setting

(response to “What is the hardest part of solving a story problem in math?”):

“adding numbers in my head” “figer out what the anser is.” “remebering”

“writing the anser wen you don’t know it.” “writing”

Response to metacognitive prompts

“How did the Content Frame help you learn?”

“It was very easy.” “we figyer out the problum” “easier” “It split it up.”

“How did the Gallery Walk help you assemble the Pattern Puzzles?”

“by listening” “cus you saw the other people’s order” “because we looked at there’s first and then did our’s”

“That one top sheet helped.” “It gave me in idea.”

Additional metacognitive prompts that could be used:

- What did you learn? What helped you to learn that?
- What strategies did we use in this unit that helped you to better understand and why?
- Did it help to divide your learning into three strategies—Before, During, and After?
- How do you know when you’ve really understood something you’ve read or discussed? Give some examples.




About the Author: Sue Ford, District Trainer, is a Professional Learning and Leadership Consultant for Heartland Area Education Agency 11, regional office in Carroll, Iowa. She works with teachers and administrators at all levels in all content areas. Sue provides training, coaching, and school improvement consulting services to multiple districts throughout her assigned region. Her elementary experiences have helped her make successful adaptations and applications of the CRISS principles and strategies for elementary level teachers.

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Read the Problem	Operation	Show your work	Answer or solution	Illustrate the problem

Read the Problem	Operation	Show your work	Answer or solution	I Illustrate the problem
<p>25 horses</p> <p>9 horses were white.</p> <p>How many horses were not white?</p>	<p>—</p> <p>(subtraction)</p>	$\begin{array}{r} 25 \\ - 9 \\ \hline \end{array}$	<p>16 horses</p>	<p>HHHHH HHHHH</p> <p>HHHHH H</p> <p><i>FFFFFFFFFF</i></p> <p><i>FFFFFFFFFFFF</i></p>
<p>13 ducks in a pond.</p> <p>9 more ducks jumped in.</p> <p>How many ducks in all?</p>	<p>+</p> <p>(addition)</p>	$\begin{array}{r} 13 \\ + 9 \\ \hline \end{array}$	<p>22 ducks</p>	<p>DDDDD</p> <p>DDDDD</p> <p>DDD</p> <p><i>d d d</i></p> <p><i>d d d</i></p> <p><i>d d d</i></p>

Read the Problem	Operation	Show your work	Answer or solution	Illustrate the problem
<p>There were 16 mice and a cat got 7?</p>	<p>— Subtract</p>	$\begin{array}{r} 16 \\ - 7 \\ \hline 9 \end{array}$	<p>9 mice</p>	 <p>The illustration shows 16 small circles representing mice. The top row has 6 circles, the middle row has 5 circles, and the bottom row has 5 circles. The 7 circles in the middle and bottom rows are each crossed out with a diagonal line, leaving 9 circles remaining.</p>