

Problem-Solving Circles

Process for Preparing and Facilitating

- 1) As a class, discuss what it takes to have a productive conversation and to solve problems. Use results of this discussion to set group norms (which may include: respect one another, ask questions, explain your thinking, read and reread the problem, decide if your thinking is reasonable).
- 2) Teacher does think-aloud on word problems, using the thinking prompts bookmark. Students record thinking and solve problems.
- 3) Class does think-aloud on word problems as a whole group, using the thinking prompts bookmark. Students record thinking and solve problems.
- 4) Students participate in Problem-Solving Circles. (Depending upon needs of students, you may need to take time to develop student collaboration skills.) Students...
 - a. Students read the problem through once independently.
 - b. Reread problem and record thinking using 2-3 prompts.
 - c. Students get into groups of 2-4 and share thinking on problem to clarify and ensure understanding of the problem. Students work together to choose a strategy.
 - d. Students work independently to find answer.
 - e. Students regroup to compare methods of solving, clarify understanding of problem, and determine if answers are reasonable. If answers do not make sense, students return to step c.
 - f. Students work independently to record answer and reflect on how the problem was solved.
- 5) Students use thinking prompts to solve problems independently.

Notes:

- Steps 1 and 2 may need to be repeated several times before students develop an understanding of how to use the thinking prompts.
- Teachers may choose to repeat Steps 1 and 2 when new math concepts are introduced, or they may have students start right at Step 3.
- **Continuous reflection is a key element in this process.** Teachers should reflect on the quality of their think-alouds, and teachers should help students evaluate the effectiveness of their problem-solving circles.
- **Refer daily to the group norms.** Revise as necessary.

Math Practice Standards

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.

College and Career Readiness Standards in Literacy

Reading

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Speaking and Listening

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.
4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

Language

6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level.

Problem-Solving Circles

Thinking Prompts

I notice...
One pattern I see is...
I need to draw...
I already knew...
This reminds me of...
I am confused by...
My first step is...
A question I have is...
I need to know...
_____ in math means...
A strategy to use is...
It is important to remember...

Process



Created by Nicole Hawkins, Jill Leffler, and Samantha Goodger (2015).

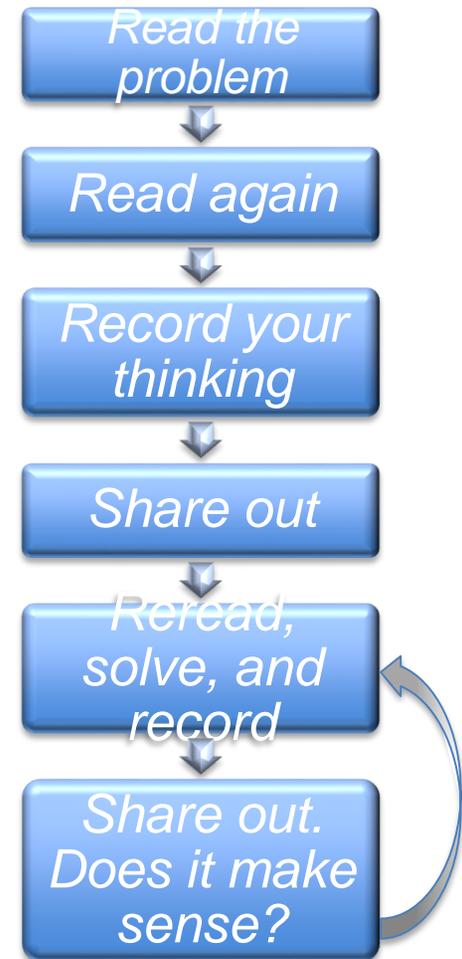
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Responses

To the thinking prompts:

Why did you think that was important?

How will you use that strategy?

I saw something similar...

To the answer and explanation:

I agree/disagree with _____'s thinking

because...

How do you know that?

How did you figure that out?

Can you explain that in another way?

How does your visual support your thinking?

_____ (this part) really helped
me understand your thinking.

What if _____?

Is that what the problem was really asking?

However, it says in the problem _____.



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