3-Read

Purpose: engaging students in making sense of a problem before they set out to solve it

GENERAL DESCRIPTION:	
3-Read is a mathematics and language comprehension strategy designed to delay the rush to an answer, deepen student understanding of both the situation and the mathematics, and help students make sense of a problem before setting out to solve it. The strategy consists of reading the stem of a problem (the problem without a question) three times aloud, in close proximity, while establishing a specific purpose for each read: 1) comprehending the text; 2) comprehending the mathematics; and 3) eliciting mathematical questions based on the information provided. Too often, students disengage from math problems, and simply take the numbers and do something with them (add, subtract, multiply or divide). 3-Reads is designed to engage them in making sense of the problem first, and then drawing connections between the situation and the quantities presented. By asking students to come up with mathematical questions on their own, 3-Reads focuses their attention on the context and the mathematical structures, and helps to ensure that students understand both the explicit and the implicit information and quantities presented, setting them up for meaningful productive struggle with a math problem. It delays their need for an immediate answer, and helps students get to the mathematics of a lesson or a unit. Finally, 3-Reads is a whole group strategy that helps students develop language and mathematical literacy, healthy habits of mind, and an increased capacity to engage in problem solving, all of which build students' capacity for doing mathematics both in a group and individual setting.	
WHEN AND WHY IS THIS USEFUL?	**WHAT CAN STUDENTS LEARN FROM THIS EXPERIENCE?**
3-Read is useful: • For unpacking complex language, and focusing student thinking around understanding the quantities in a problem and their relationships to each other. • For understanding word problems containing explicit and non-explicit quantities, particularly when the problem is not in the student's primary language. • For surfacing the math that helps students get to the mathematics of the unit. • For identifying quantities and context • For delaying the answer-getting, and facilitating student engagement in productive struggle and reasonable problem solving. • For developing mathematical literacy	• Ways to see the mathematical structure of a word problem • How to identify and understand the mathematical structure of the problem in a way that will allow them to generalize to similar word problems • Strategies to draw connections between the context of a situation and its relationship to a math solution • Strategies to help them unpack word problems on their own • Ways that the skills they use with text in other disciplines can support their understanding of math. • The joy of engaging in mathematics that makes sense.

3-Read: Step-by-Step

Ready to try using 3-Read? Here are step-by-step instructions for structuring 3-Read in a lesson.

1. Start by identifying a problem that would be more accessible to students through a 3-Read. Consider whether the problem includes quantities in context, relationships between quantities, and/or nuanced language. (See "Identifying a Problem," below.)
2. Anticipate the points of confusion students may encounter. Identify specific phrases that might be unclear or open to interpretation, and the numerical relationships that are likely to be the greatest obstacle. Before engaging students in the 3-Read, think about everything you want them to extract from the information given. If appropriate, craft follow-up questions for Read 2 (below) to focus students' attention on key parts of the problem.
3. Frame the strategy. Tell students the class will read the problem three times, and that each time you will ask students to answer a specific question. The first time, students will need to listen carefully because they will not have the problem in front of them in writing.
4. Go through each of the three reads, debriefing after each question.

    Read 1: **Comprehending the text.**
    Before showing the text to students, teacher reads the problem (minus the problem stem) out loud, and prompts: *"I want you to think about what is going on in this problem. What is the context of the situation?"* This debrief is not going after the mathematics or the quantities and relationships, but probing how clearly students understand the context so they can make sense of the mathematical situation in the next read.

    Read 2: **Comprehending the mathematics.**
    At this point, students should have the written problem in front of them, either projected or on paper. Teacher or student reads the problem stem again and prompts: *"What are the quantities in the problem? What do they mean? How are they related"* (in early grades, teacher might offer "quantities are numbers or amounts," in later grades teachers might offer, "quantities are numbers and their units"). Students should identify quantities. Those quantities may be explicit (70 inches) or implicit (i.e., if 70 inches and 64 inches are both stated in the stem then the difference of 6 inches is implicit, or if a quantity is referenced without a numerical value, such as "Leo's height").

    Read 3: **Listing all possible mathematical questions.**
    Problem is read, and teacher prompts: *"What are all the different mathematical questions you can think of about this situation?"* The questions students come up with should focus on the quantities presented and the relationships between them. This step should not take significant time; the process of eliciting mathematical questions offers the teacher an opportunity to assess quickly how well students have made sense of the context and structures of the math problem. This debrief ends with, *"… and here is the problem we are going to work on today."*

5. Allow students to work on the problem.

Identifying a Problem

If you anticipate that students may find it difficult to read and interpret a particular problem, using a 3-Read may help students to unpack the text and focus on the core mathematics. However, 3-Read is not an appropriate strategy for every text-rich problem. Here are some things to consider when deciding whether a 3-Read is a strategy that is well-matched to a particular problem.

- **Does the problem have quantities (both implicit and explicit)?** An ideal problem for using 3-Read includes quantities that are easily visible, as well as a quantity that is implicit. For example, it might refer to "10 flowers, four of which are purple and the rest of which are orange." Identifying quantities (Read 2) points attention to the 10 total flowers and four purple flowers, as well as the implicit quantity of orange flowers (which students may immediately recognize as six flowers). Specific quantities allow students to connect the numbers they are working with to a context.

- **Will students understand the roles and relationships of the numbers and quantities in the problem?** If a problem contains many extraneous numbers, or multiple implicit quantities, a 3-Read may help students slow down and understand the information in the problem before they attempt to find an answer.

- **Have students been challenged to understand relationships between quantities in similar problems before, or to determine exactly what a similar problem was asking them to find?** If the relationships between quantities in a problem are complicated, using a 3-Read can help students better understand the structure of a problem and clarify what is being asked of them. Further, because the strategy focuses attention on the quantities *in context* before students move into solving, they are more likely to understand the question they are trying to answer before they begin making calculations.

- **Is the complexity of the language in a problem or the specific nuances of language likely to get in the way of students being able to understand what the problem is asking? Would a purposeful second reading of the text of the problem enhance student understanding?** In situations where students might read a problem once and quickly move to using operations on the numbers they see, slowing down to spend time understanding the context can give students a frame through which to interpret the numbers. Attending to the details of language can help to shed light on the relationship between the situation itself and the mathematics. Often, a solid understanding of the context can help students see the mathematical structure of the relationships and clarify a reasonable solution path, as well as to evaluate whether an answer is reasonable.