tools for **sense-making** in mathematics

Check out the tools online!
math.serpmedia.org

A SERP partnership with middle school mathematics teachers in San Francisco Unified School District set out to shift the culture of mathematics classrooms away from answer-getting and toward sense-making. As a result, Tools for Sense-making in Mathematics was developed, an approach to help teachers guide their students through solving word problems.

The tools include:

- **Stem/Question/Solution Triangles:** A guide to looking at word problems in three distinct parts, which enables teachers to scaffold them so that students conceptualize the question themselves.
- **Using Multiple Representations:** An approach where students learn how to make sense of word problems by generating various representations of problems, such as an equation, table, diagram, or graph.
- **Mathematical Diagrams:** A method of using diagrams of a problem situation to determine where the numbers in the problem are coming from.

Using **Stem/Question/Solution Triangles** for instruction:

STEM:
Offers a brief description of some quantitative information.

A dragonfly can fly fast. It can go about 50 feet in two seconds.

How many seconds would it take for the dragonfly to go 275 feet?

QUESTION:
Uses the information in the stem and asks that it be applied it to a situation that is different or more detailed.

$$\frac{2 \text{ sec}}{50 \text{ feet}} = \frac{n \text{ sec}}{275 \text{ feet}}$$

$$n = 11$$

SOLUTION:
Provides a mathematical representation of the question using the information in the stem, as well as an answer.

As a teacher, I can present these triangle diagrams with information in any one or two of the three sections. That way students are challenged to make sense of the mathematics.

Diagnostic Teaching

Tools for Sense-making in Mathematics led to the development of ***Poster Problems,*** *a set of* **12** two-day lessons for sixth and seventh grades specifically designed so teachers can see and analyze the thinking of students in real time. Find out more at **math.serpmedia.org!**

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