ALL LEARNERS NETWORK

Math for Every Student

Middle School Tasks

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Goals

- To engage in problem solving
- To explore ways to modify problems

All Learners Lesson Structure

- Launch
- Main Lesson
- Menu
- Closure

Implementing Tasks that Promote Reasoning and Problem Solving

Characteristics of Tasks:

- The mathematics is problematic for students,
- The task connects with student prior knowledge,
- The task engages students in thinking about important mathematics.

Spangler, D. A., Wanko, J. J., & National Council of Teachers of Mathematics. (2017). *Enhancing classroom practice with research behind Principles to actions*.

Problem solving can be understood as a process where previously acquired data are used in a new and unknown situation. (NCSM, 1989)

Benefits of Problem Solving

There are several benefits to having students engage in productive struggle as they solve mathematics problems:

- a sense of accomplishment;
- knowledge and understanding;
- improved achievement; and
- mastery and long-term retention.

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ALN Problem Solving Protocol

- Chorally read the problem.
- Ask, “What is this problem trying to figure out?”
    - This can be written on the board for everyone or each learner can write it on their paper. Have students rephrase into their own words.
- Ask, “What would an answer to this problem look like?” You can also ask, “What would a wrong answer look like?”
    - Identify the correct unit.
    - Probe for reasonableness.
- Brainstorm potential strategies.
- Express encouragement and ambivalence about each suggestion.

Triangles

What does it mean when triangles are similar?

If you know the lengths of two sides of a triangle, what do you also know about the third side?

Triangles

Two triangles are similar.

The first triangle has sides of 6, 8 and X.

The second triangle has sides of 18, 12, and Y.

1) What could X and Y be?

   Please try to find all of the possibilities.

Debrief: Write the solutions in the box for your breakout room.

1) x=9 and y=16

2) x=12 and y=9

3) x=4 and y=24

4) x=16/3 and y=13.5

1) x = 9 and y = 16
2) x = 4 and y = 24
3) x = 5 ⅓ and y = 13.5

Menu

- Look at the Menu Tasks
- Examine the:
  - Choice of numbers
  - Questions

At the Theater

There are 396 people in a theater. The ratio of women to men is 2:3, and the ratio of men to children is 1:2

1) How many men are in the theater?

Menu

- Look at the Menu Tasks
- Examine the:
  - Choice of numbers
  - Questions

Feedback

Please click on the title to give feedback.

Thank you for participating!