Approximate Time: (1.5 hours)

**Goal**: This activity consists of a Carousel and can be used either with teachers or students. The goal for teachers it to examine several reasoning problems that can be done in Algebra 1, notice the SMP used, and discuss how to support students’ development of SMPs while doing them. For students, the goal can be similar: after they solve the problems, facilitate discussion about how they used the SMP.

**Materials**: Poster paper (1 or 2 per task), markers, printed tasks, printed directions for the document camera, 3-by-5 cards for grouping (optional)

Create one large poster for each task. Draw lines to divide each poster into three parts so that it looks something like the table below. Put the task above or next to the poster where it will be easy for teachers to read.

|  |  |
| --- | --- |
| SMP | Possible solutions |
| Strategies |

Notice the structure of the task: All students (or teachers) involved, so all sharing their thinking; teacher is focusing on goal of improving students’ algebraic reasoning and can take the results to their PLC to discuss.

When teaching or modeling teaching, it is important to be explicit with students or teachers when you are using SMP, and also to describe it when they are using them. Whenever possible, distinguish higher levels of use of the SMP and how their use helped students better solve a problem or make sense of the concepts and procedures.

**We used the following grouping strategies with teachers**: Each person uses a 3-by-5 card to create an algebraic expression using the variable x and at least 3 different numbers and 2 different operations. Only use those operations seen in Algebra 1 (e.g. no logs)

Line up in order by the value of your expression when x=-10 (least to greatest, left to right). [If your expression is undefined at x=-10, go to the far left. If your expression is not a real number when x=-10 go to the far right.] If your expressions are equal when x=-10, order yourselves by your value when x=0.

(Maybe: Find the x-value at which your expression and your neighbors’ are equal. How could you adapt an activity like this for your students? For what goals? (My goal is that I wanted to regroup you, but also want to use mathematics whenever possible.) Walk along the line and group them so that there are 3 per group

**Carousel directions**:

There are 6 tasks on posters posted along the wall. (Each one will have the task above it, 3 sections of one poster and ‘Teaching moves’ on a poster next to it.

**For use with teachers**: We’re going to conduct this differently than we would if you were Algebra 1 students. The goal is to ***slow down*** ***the process*** and examine which SMP you use and how you use them. How could you describe your use of the SMP to your students? How would you describe others’ use of the SMP as you listen to them talk? What would you expect students to do and how might you support their use of the SMP? When do you see a potential for the use of SMP and can encourage it?

**Start at a poster**:

(2 minutes) Read and discuss the problem as students might: what does the question ask for? What meanings do you need to have?

(3 minutes) Pause and reflect on the SMP used. How would you describe the SMP you used and that used by others in your group? How could you use what you heard while teaching? Write those descriptions on the Teaching Moves poster

(2 minutes) Spend another three minutes proposing different strategies for solving the problem. Do not solve the problem!

Move to the poster to your right.

(3 minutes) Read, understand, and discuss the problem, the SMPs suggested by the previous group, and their proposed strategies for solving the problem. Add any new strategies you think of to the proposed strategies.

(3 minutes) Work on possible solutions and strategies students might try.

(3 minutes) Describe your group’s use of the SMP: how could you use what you heard while teaching? How would you help students improve their use of the SMP while solving this problem? Write those on the Teaching Moves.

Move to the poster to your right.

(5-7 minutes) Read and discuss all that is there to understand the problem, the SMPs used, strategies suggested and started. Add anything you think is missing or that would further flesh out the reasoning on this problem. Work on solving the problem, either by finishing the solution that was started or by solving it a different way.

(3 minutes) discuss the SMP you used and how you used them. How could you use what you heard while teaching? How would you help students improve their use of the SMP while solving this problem?

Move to the poster to your right.

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In what ways could this activity meet our characteristics for teacher learning? (e.g. structure, goals, processes) What else would you need to include to make this an opportunity for you and your PLC to learn?

Take the first posters you were at back to your tables and discuss/plan:

1. Suppose you are going to use just this task in teaching: How would you set this task up for students in your class?
2. How would you help them persevere in making sense of and solving the problem and become aware of the SMP that would be helpful in solving it?
3. How would help them use more sophisticated levels of the SMP?

**Whole group share out** of what teachers thought were the most important take-aways of this activity.

**Whole group share out with students**: Which SMP do you better understand? Which ones do you have better ways of using now? Explain.