**Notes for use with teachers:**

This activity uses a **Chalk Talk** (Sliman, 2013) and is designed for use in a large group of teachers (30-50) who are in regular small groups (PLCs) within the large group.

**Time**: 1 hour.

**Materials:**

* Blank paper
* Four large poster papers, each with a task taped in the middle that describes student errors, and additional poster paper as needed. Tape these poster papers to the wall at a height that teachers or students can easily write on them, or lay them on tables if the tables are big enough.
* Task sheets for individuals so they can record their thoughts at the end.
* Four colors of markers (each person in a PLC should have their own color of marker)

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| On Pp Goals:* Examine student work to identify mathematical thinking and misconceptions;
* Brainstorm activities that could help students develop the understanding missing in the error.
 | (5 minutes)Teachers should be in groups of 3-4 others who are not in their PLC. To create the groupings, give them markers so that each person in a PLC has a different colored marker. They should move to their ‘color group’ to start the discussion. |
| On Pp:What are some different strategies you have for handling student errors? What strategies could involve the standards for mathematical practices?Discuss in your small group and brainstorm several ideas. | (15 minutes) Need blank paperGoal is to brainstorm strategies for responding to student errors. Possible answers:* “Correct it” right away
* Tell students to ‘check their answer’
* Use as a point of classroom discussion: (errors as springboards for inquiry or discussion) (involves SMP 3)
* Give a counter example
* Ask a question that gets students to reconsider their reasoning
* Create an activity that helps students distinguish the concepts or recognize their overgeneralization

Facilitator: Ask groups to share a couple of their ideas with the whole group. Facilitate discussion to focus on students’ improved use of the SMPs to make sense of the mathematics and correct it themselves.  |
| On Pp:Silently, only through writing, brainstorm and discuss1. The error(s): what error or difficulty is evidenced in the work? **What *conceptual* underpinnings may underlie the error?**2. Describe some activities that you could use to help the students develop understanding. | (28 minutes) Explain what a Chalk Talk is:The conversation at each poster will be *silent* (no talking)*.* All discussion will be written, so be sure to be complete.Task A: redTask B: blackTask C: blueTask D: greenTell teachers:Once at your poster, *silently* discuss the error through writing, and ways to help students *understand and encourage use of SMP*.You will get 7 minutes at each poster. Be sure not to write so big that there is no space left, but write big enough so others around the poster can read it to respond.Then, time each group to cycle through the four posters for 7 minutes each. Facilitator: if you notice that the conversation needs to be longer, only have each group go through 2-3 of the tasks and give them more time at each poster. |
| (7 min) Give task sheets to teachers and let them discuss in their groups and write their summarized ideas on their own individual papers. |
| On Pp:What did you learn about student errors and how to approach them?andIn what ways could you use a Chalk Talk with your students? | (5 minutes)Individual reflection on half sheets to turn in |

**Notes for use with Students**:
A Chalk Talk and these error analysis tasks could also be used with students, although the directions would be simplified to ask students to correct the error, discuss what they think the student could have been thinking, and how they know they are correct. They could also describe which SMP they used.

Sliman, E. (2013). Visible thinking in high school mathematics. *Mathematics Teacher.*