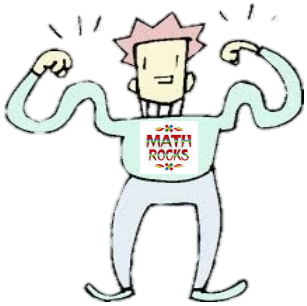
Low Floor High Ceiling Tasks

(Build your Students' Mathematical Muscle!)



What is it?

Low Floor High Ceiling Tasks are those that all students can access but that can be extended to high levels. These tasks are important because all classes are heterogeneous. LFHC tasks allow students work at different paces and take work to different depths at different times. The low floor high ceiling tasks preferred are those that are also visual and lead to rich mathematical discussion *(taken from youcubed.org).*

Low Threshold High Ceiling Tasks are activities that everyone in a group can begin and then work on at their own level of engagement. But these tasks have lots of possibilities for the participants to do much more challenging math*(taken from nrich.maths.org).*

How will I know if an activity is a low floor high ceiling tasks?

- One indicator is when the work to the problem becomes much more important than the answer itself.
- Can all students access the problem? Is there room for students to explore more math concepts at higher levels?
- LFHC tasks lead to rich mathematical discourse.

What do I need to do to prepare an activity like this?

- Most importantly, do the task yourself. Reflect on your learning intention and how you will know if students are successful.
- Think through coaching questions/statements that might help students that are stuck. Be sure that the questions nudge students thinking but do not lower the cognitive demand of the task.
- Think about supplies students might need to be successful with the activity and have them available.
- You do not necessarily have to know all of the exact answers before your class begins the task. Imagine how excited your class would be to know that they found a solution that you had not!

Benefits to using Low Floor High Ceiling tasks

- Allows learners to show what they can do, not what they can't
- Provides Differentiation to nearly all learners, high flyers can explore and challenge themselves and less confident students can consolidate their thinking
- Learners often raise their game when participating in discourse about the activity since they too had spent time on the same topic
- Promotes positive classroom culture
- Offers many possibilities for learners to focus on more sophisticated process skills rather than more knowledge
- Mirrors real life math
- Hits numerous Math Practice Standards
- Promotes the belief that "I can do math!"
- Helps students see that Math Is Fun!

Where can I find more activities like this?

- http://youcubed.stanford.edu/tasks/ (under grades choose Low Floor High Ceiling)
- nrich.maths.org/7701/index
- http://www.insidemathematics.org/problems-of-the-month
- https://www.illustrativemathematics.org

Can you adapt tasks to become LFHC tasks? (YES YOU CAN! ☺)

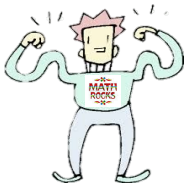
Lucy has measuring cups of sizes 1 cup, $\frac{1}{2}$ cup, $\frac{1}{3}$ cup, and $\frac{1}{4}$ cup. She is trying to measure out $\frac{1}{6}$ of a cup of water and says, "If I fill up the $\frac{1}{2}$ cup and then put that into the $\frac{1}{3}$ cup until it is full, there will be $\frac{1}{6}$ cup of water left."

(*Taken from Illustrative Mathematics "Measuring Cups"*)

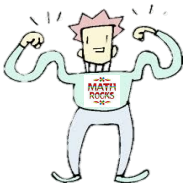
Is Lucy's method correct? Explain.

How might you make this a LFHC tasks?

- Lucy wonders what other amounts she can measure. Is it possible for her measure out $\frac{1}{12}$ of a cup. Explain.
- What other amounts of water can Lucy measure?



Low Floor High Ceiling Tasks Planning Guide



What is the learning intention for this task? How will you know students are successful?	What roadblocks might your students encounter?	How could this be adapted for primary grades? (or) How could this be adapted for middle school?
What mathematical knowledge/skills will this problem uncover?	What questions could you ask to nudge students' thinking without lowering the cognitive demand of the task?	What supplies might you have available for students to access during this problem?

Four 4's Problem

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20