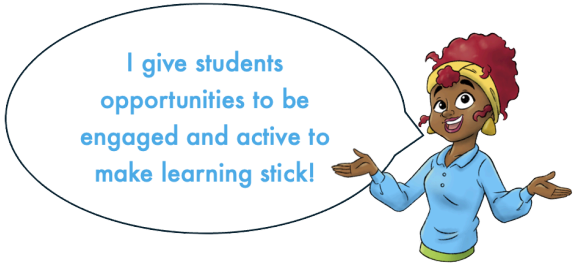
Three Sparks for Making Learning Hands-on and Minds-on



When students work with hands-on materials, it makes their learning inherently more active, engaged and meaningful. Teachers can further facilitate student learning by extending hands-on activities to minds-on experiences. These activities support the 6 Cs of content expertise, creative innovation, and confidence. Check out the strategies below to advance hands-on to minds-on practices in your classroom:

1. **Prioritizing Framing and Debriefs:** Thoughtful, purposeful questioning before and after hands-on experiences helps students move through levels of understanding (concrete to representational to abstract), make connections, grasp key take-away ideas, and organize their thinking, especially if the questions are intentionally tied to the lesson objectives. For example, a teacher might introduce an inquiry into the potentials and challenges of nonstandard measurement with the question, "How could we use our feet to measure length?" Students could then individually measure objects with their own feet or tracings of them. During the debrief, a teacher might also guide students to notice differences in individual measurements of the classroom carpet, causing them to wonder why that might be. A teacher might further build the concept and facilitate discussion by asking what may happen if a baby sibling or the school principal's foot was instead used to measure the same carpet.

Framing Questions to set the stage	Debrief Questions to build understanding
What happens when we...?	What did you notice? What do you wonder?
What are some ways...?	What if we did this instead..?
How could we use ..... in order to .....?	What does this remind you of?
What do we already know about .....?	How could we show this using pictures, numbers, or words?

2. **In Their Own Words:** When students put learning into their own words, they process their experience with the hands-on activity and develop a sense of ownership of the content. This also provides an informative assessment opportunity for teachers. Encourage students to use words, numbers and/or pictures to describe their learning from a hands-on activity, and offer a variety of formats to record their thinking such as an exit ticket, math journal, sticky notes to be added to a class poster, audio recording, video recording, or personal letter to teach an absent classmate about the math they learned. Consider providing support to students through a word wall or sentence stems.

3. **Open-ended Exploration:** While it might be tempting to jump right into a teacher-directed activity when using manipulatives, there are many important reasons to build in time for open-ended exploration. Opportunities for free play before introducing a task helps to satisfy student curiosity so that students can better focus when an instructional task is introduced by the teacher. Open-ended exploration with hands-on materials also activates students' prior knowledge and allows students to make their own discoveries about the manipulatives. Consider providing materials for students to record their discoveries such as a shared chart paper, sticky notes, individual whiteboards, or math journals. As students explore the hands-on materials and manipulatives, a teacher might observe and listen to students, gaining valuable information about prior knowledge, strengths, and misconceptions. Such observations can inform future lessons and provide insights into how individual students think, persevere, and learn. In this way, open-ended exploration can be paired with framing and debriefing to take free play to guided play in a later lesson.