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Productive Prompts to Support K–2 Student Engagement with Science

Use these short, productive prompts to spark curiosity and deepen science discourse in your K–2 classroom. Instead of checking for the "right answer," productive prompts help students share their ideas, test out explanations, and engage with the practices of science. Try choosing one or two prompts that fit the moment and adjust the wording to your students' level.

This resource is for **teachers of K–2 students**, **science specialists**, and **instructional coaches** who support early elementary classrooms. It may also be useful for **informal educators** who want to encourage young children's engagement with science practices.

About this Resource

Teachers ask questions all day long, but not all questions have the same effect. **Productive prompts** spark curiosity, promote deeper thinking, and engage students in the practices of science. Unlike questions that check what children know and can do, productive prompts encourage students to:

- ✓ Observe
- ✓ Wonder
- ✓ Test
- ✓ Explain in their own words

This resource offers ready-to-use examples of prompts you can try in your classroom. The prompts are organized by the NGSS science and engineering practices, with clear purposes and sample questions. You don't need to use them all – pick one or two that fit the moment and adjust the wording for your students.

Practices, Purposes, and Sample Productive Prompts

Science and Engineering Practices	Purpose: *To help students...*	Sample Productive Prompts
Asking questions (science) and defining problems (engineering)	Express their curiosity and wonderings, and begin to think about how we might investigate our questions given the materials we have on hand.	• What details do you notice? • What does this make you think about? • It looks like you're wondering about ... • What ideas do you have about how ...? • I'm wondering about ... • How do you think we might use these materials to find out more about ...?
Developing and using models	Create something that helps them share their observations and ideas or helps them investigate a question that is hard to investigate in the real world.	• Can you draw a picture that shows what you observed? • How could we use these materials to build something that shows our different ideas? • What parts would you like to add to make it look/work more like the real thing? • Can you show us what you mean by acting it out? • How do you think we can use this model to investigate to test our question?
Planning and carrying out investigations	Articulate their questions; prepare to investigate; make predictions; engage in a direct exploration to gather information in relation to the questions; and collect and record their observations.	• What do you think will happen/we will observe when we try that/do that? • What should we do first? Second? Third? • What materials do we need/can we use to test our ideas? • Let's draw/write down/take photos/make a video of what we observe. • What happened when you did that? • Try using the hand lens so you can see more details. What do you notice now that you didn't before? • How did you make that happen?
Analyzing and interpreting data	Collaboratively look at and compare their observations and look for relationships and patterns.	• What are some things you noticed? • When you both tried that, what did you notice was similar? What was different? • How are your drawings of what you observed the same/different?

Science and Engineering Practices	Purpose: *To help students...*	Sample Productive Prompts
		• What did you observe with the hand lens that you couldn't see without it? • What ideas do you have about how ... happened? • Now that we have tested our question, what are you thinking about why that happened (student claims)? What are we still wondering? What other evidence could we gather so we are sure?
Using mathematics and computational thinking	Use mathematics and mathematical thinking as a way of describing and organizing information and tasks.	• How could we organize/sort/group this information (by size, number, or shape) to make a comparison? How does this measurement compare to our prediction? • Let's track putting them in order from smallest to biggest/sorting them by shape. • How do you think the size/shape/weight matters for...? • How could you explain what you did to someone else? • Have you observed something similar before? What? • Let's look for a pattern.
Constructing explanations (for science) and designing solutions (for engineering)	Generate claims or ideas about why things happened the way they did.	• Why do you think that happened/looked/ sounded the way it did? • How is what happened different from what you thought would happen? • Before, you said you thought... Do you still think that, or do you have a different idea now? • Can you tell us more about your idea (claim)? • We seem to have different ideas about how that happened. I wonder why. • How could we investigate our ideas some more?
Engaging in argument from evidence	Describe the reasons for their claims and ideas based on what they observed.	• What did you observe that makes you think that? • Do you agree or disagree with that idea? What did you notice that makes you agree/disagree?

Science and Engineering Practices	Purpose: *To help students...*	Sample Productive Prompts
		• Can you show me what happened that helped you come up with that idea? • What's another way to think about it?
Obtaining, evaluating, and communicating information	Choose and use resources for obtaining more information and sharing our observations, experiences, and ideas with others.	• I found a book/video that could help us find out more about ... • What do you think the author was trying to tell us about ...? • How was what we read in the book/what our classroom visitor said different from what we thought? • What's the most important thing you would want to share about what you learned? • We could write a story, act out a play, or make a video about what we learned. What do you think would work best?

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