

See-Think-Wonder Strategy for Phenomena-Based Science Instruction

Step 1: Engage students with the phenomena.

- **Phenomena:** An observable event that can be explained or explored using the three dimensions ([Science and Engineering Practices\(SEPs\)](#), [Crosscutting Concepts\(CCCs\)](#), and [Core Ideas\(CIs\)](#)). [Sample See-Think-Wonder chart with a phenomena.](#)

Step 2: See (Alone Zone 2 minutes)

- What do you see? What do you notice? Students make observations (both quantitative and qualitative) of the phenomena. In this column, there should be short bullet point ideas, not long formal sentences. Allow students time to think by themselves FIRST (alone zone for about 2 minutes) before sharing ideas with a partner or small group. **Observations only, no inferences.**
 - **Quantitative:** using measurements and/or numbers
 - **Qualitative:** describing using 5 senses (see, feel, smell, touch, taste)
- Invite students to share observations with a small group- take turns to read their list. Accountability- as students listen to their group members' ideas, they place a checkmark next to ideas they also had (in common) and add new ideas to their list.

Step 3: Think (Alone Zone)

- What do you think is going on? What do you think is **causing the phenomena** to happen? Students connect their observations to prior knowledge in this column, specifically focused on drawing upon prior knowledge that is **related to the phenomena**. The goal of this column is to narrow the focus- what do you think is causing the phenomena to happen? Making inferences here is acceptable.
- Educators should observe what students are writing in this box as it provides a window into what the student is thinking, i.e. preconceptions/misconceptions, and prior knowledge, but **avoid addressing misconceptions here**. The “think” column is a useful formative assessment tool and **is not intended to be shared**-it is for the student and for the educator.

Step 4: Wonder (Alone Zone time- this is the **SEP of Asking Questions**)

- What do you wonder about the **phenomena**? What questions do you have about the phenomena that we can investigate? What do we need to know about the phenomena to help us make sense? Students develop questions for an intentional purpose, which includes researching, investigating using hands-on materials, experimenting, etc. The goal is to help the students **develop explanatory questions (how or why the phenomena occurred) that we can investigate** to figure out what is causing the phenomena to occur and use the student questions to drive instruction. What are we all wondering about?
 - **Sample:** [Develop questions](#) to investigate the [causes](#) of the ice cubes floating in the middle of the cup.
- Invite students to share their questions with a small group- take turns to read their list. The group should come to consensus on **one** question to offer to the whole class. (See [Question Formulation Technique](#) for more info on helping students ask questions)

*****This is a strategy for helping students make their thinking visible and should be used at the beginning of an instructional sequence when engaging students with the phenomena.*****



SEE

What do you see?



THINK

What do you think is going on?



WONDER

What does it make you wonder?