Short Answer

Teaching Tips

To help foster a supportive environment for feedback, introduce the importance of feedback and how to give empathetic feedback with our mini-lessons.

The best questions are open-ended and ask students to **justify** opinions, **analyze** material, **articulate** a thought process, or **evaluate** a claim.

⚠ **Avoid** fact-based recall questions.

The best feedback criteria are **positively oriented** and relevant to learning objectives. Criteria can focus on both **content knowledge** and **writing structure.**

- Make students aware of the criteria so they know how to craft their response. Or, have students decide what appropriate criteria would be.
- Emphasize that students have to make a choice about assigning feedback. *Both* or *neither* aren't options!

The best discussion questions ask students to **verbalize their thought process** about the feedback they gave. For example: "93% you said Response 1 explained the concept of photosynthesis better. Can someone share what aspect of the response made you think that?"

- Have students **predict** what results will be.
- Focus discussion on the qualities of the **responses** rather than on the students who wrote the responses.

To promote students' **metacognitive development**:

- Encourage students to **ask themselves questions** during the activity:
  - "Does my response meet all the criteria?"
  - "How did giving feedback improve my understanding of the content?"
  - "How can I improve my response using the feedback I got?"
- Provide clear **time signals** throughout the activity.

To **incorporate feedback in the moment,** ask students to reflect on how they can improve their response after receiving feedback. You may want to take time to have them **revise** their responses, either in class or for homework.

Earth Science

In all Short Answer activities, your students **create** responses, **compare** peer responses and provide scaffolded feedback, then **converse** results as a class.

Short Answer gets your students the immediate feedback they need through social, engaging peer feedback activities and gets you deeper insight into what your students know.

Short Answer can be used at every stage of your Earth Science lesson plan from lectures to practicing scientific process skills:

Bellringer	Get students warmed up and engaged by using Short Answer to prompt written responses about what stands out from yesterday's class.
Check for understanding	Break up lectures with quick feedback activities that get students interacting with one another. Deepen understanding while getting a quicker, more accurate pulse of what they know on an individual level.
Guided practice	Group students together to write responses and give feedback to other groups, or provide a model response in Short Answer.
Independent practice	During Short Answer activities, encourage students to reflect on how their response matches up to the ones voted as the strongest by the class. Invite revision and iteration of responses as another in-class activity, exit ticket, or homework.
Labs	Use Short Answer to bring feedback into the scientific process. Your students can create procedures for experiments, hypothesize results, and infer conclusions from data before bringing them to the class for analysis and debate.
Exit Ticket	Complete a quick, one-round Short Answer activity to leave students thinking about the most important points of the day.
Homework	Have students complete writing assignments about core content and bring them in next class for peer feedback activities and discussion to deepen understanding.

See the following page for two detailed Earth Science use cases with example questions, feedback criteria for students to evaluate responses with, and standards alignments.

Sample Use Cases: Earth Science

Mid-Lesson Content Review
Activity Time: 5-10 minutes
Use Short Answer to assess whether students understand new material. Results from the feedback activity inform whether content needs to be re-explained or if the class is ready to move on.

Sample Questions

- What do the processes of evaporation, transpiration, and sublimation have in common? How are they different?
- Explain how a volcano forms.
- What do you think are the two most significant causes of climate change? Why? Propose an idea that can help reduce the impact from one of the causes.

Feedback Criteria: detailed explanation; accurate; use of claims to support argument

Standards Alignment Examples

- Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. *(NGSS, MS-ESS2-4)*
- Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. *(NGSS,*
- *HS-ESS2-1)*
- Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. *(NGSS, MS-ESS3-4)*

Designing Experiments and Analyzing Data
Activity Time: 10-15 minutes
To practice experimental design skills, have students write procedures that answer a question about earth's systems and processes. Or, have them analyze data from experiments and infer what results mean.

Sample Questions:

- Write out the steps of an experiment that tests how the shape of an ice cube affects how fast it melts. What results do you expect?
- You are presented with two pieces of unidentified rock strata. What method would you use to determine which piece is from an earlier time than another?

Feedback Criteria: accurate hypothesis; precise experimental procedure, use of evidence to support inferences

Standards Alignment Examples

- Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes (*NGSS, HS-ESS2-5)*
- Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history. (*NGSS, MS-ESS1-4)*