Engineering Activity 8: Spread the Word: Preparing for the Engineering Share-Out

Educator Preview

Activity Snapshot
Learners recommend a remote sensing device to be sent on a spacecraft.

Timing | 45 minutes

Get Ready and Team Up	10 min.
Share-Out Preparation	25 min.
Reflect	10 min.
Total	**45 min.**

Prep Snapshot*

Prep Time   40 min.

Set up Space Screens and a Materials Table.

*See Materials & Preparation for full info.

21st Century Skills

Connection
- Collaboration
- Communication

Habits of Mind
- See themselves as problem solvers.
- Make evidence-based decisions.

? Guiding Question

How can we share information about our remote sensing device design with others?

Learners Will Do
Plan and create materials for communicating learning and designs to others.

Learners Will Know
Engineers have valuable knowledge to share about the problem they have solved.

Connecting Across Activities

Activity 7: The Final Test	Activity 8: Spread the Word	Activity 9: Sum It Up
Last time, learners used what they learned from testing to improve their devices.	**Today,** they plan to share their designs at an Engineering Share-Out.	**Next time,** they will meet with community members at the Engineering Share-Out to have conversations about their designs and remote sensing.

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Activity Resources

Access videos and digital resources using the link or QR code below. More information for teaching this curriculum is available in the Educator Guide Introduction, pgs. iii-xxvi. Access more PLANETS units, research, and pathways at https://planets-stem.org/.

QR Code for Activity Resources

weblink: https://hov.to/36f54972

Materials and Preparation

Materials

For the whole group

- *Our Ideas* poster (on paper or a shared digital document). See Prep & Setup Guide (PDF) Examples | Templates
- crayons and markers
- Model landscape sites and Space Screens from Engineering Activity 7
- remaining materials from Engineering Activity 7
- ways to record ideas, such as chart paper, index cards, or sticky notes

For each group of four

- remote sensing devices from Engineering Activity 7

For each learner

- Engineering Notebook (PDF)

Activity 8 Materials Preparation (40 min.)

Ahead of Time

1. Review the "In-Use Example" in the Prep & Setup Guide - Examples (PDF) to help you think about what to add to the *Our Ideas* poster during the discussions in this activity.

2. Invite people from the community, including families and friends of learners, to the Engineering Share-Out.

In Your Space

3. Place the *Our Ideas* poster in a visible place in your learning setting or prepare to share it digitally.

4. Create a Materials Table with the materials remaining from Engineering Activity 7.

5. Arrange the Space Screens according to the Space Screen Assembly, pgs. 88-89.

Activity Guide

Get Ready and Team Up (10 min.)

1. Ask: **If you did the last activity, what did you do and why?** *(We improved our remote sensing devices and tested them again to better answer scientists' questions.)* If learners describe specific improvements, you can note them on the *Our Ideas* poster.

Support Learner Differences

If new learners are joining you, lead an inclusion activity (pgs. xx-xxi) and use other engagement strategies as necessary (pgs. viii-xvi).

2. Say: **You'll be sharing information about your remote sensing devices with others.** Share the Guiding Question with learners aloud and write it on the *Our Ideas* poster *(using multiple languages as needed)*: **How can we share information about our remote sensing device design with others?**

3. Organize learners into the same groups of four as the last session.

Share-Out Preparation (25 min.)

4. Say: **We tested our remote sensing devices on test sites on Earth. NASA needs to choose remote sensing devices to send to space onboard spacecraft. We need to explain how our devices work.**

5. Give each group time to think about the following questions: **What are the important ideas you think we should share?** *(Our design process; the problem of gathering information from a distance; the definition of remote sensing; technologies for remote sensing; how our devices solve the problem of collecting information from a distance; the types of data our devices collect to answer the scientists' questions; the criteria our devices meet, etc..)* **How do you think we should share our findings?** *(Posters; drawings, mapping or graphing our findings; recording a video or audio message; staging a performance; writing a description, etc.)* When everyone is ready, discuss as a whole group.

6. The Share-Out is a chance for learners to explain their thinking and reflect on what they learned about remote sensing throughout the unit. As a group, agree upon a structure for the Share-Out. Possible structures include the following:

Support Thinking

To support learners' understanding of different methods of presenting information, have learners recall or share examples of different sharing methods they have used in the past.

- Storytelling: Groups use the evidence they've collected to tell stories about the Test Sites and what the scientists might find there.
- Gallery Walk: Groups stand at their stations and explain their technologies, posters, graphs, maps, writings, drawings, or audio or videos on small devices.
- Pair-Share: Groups pair off and share their choices with one another.
- Screening: The whole group watches video or audio files that learners have created. If time permits, they can make slideshows or animations.
- Performance: Some people play scientists asking questions about learners' remote sensing devices. You can develop script cards to include adults in the play.
- Discussion: Learners and community members share their knowledge. You can write discussion prompts to lead this discussion.

7. Say: **With your groups, prepare to communicate your designs and the information you gathered. Allow groups to collect materials and begin working.**

8. Rotate among the groups to provide support as needed. Ask: **What do you want everyone to know about your device?** *(How our device works. What information it can collect about the landscape or the minerals.)* **How will you communicate the different types of information your device collected?** *(Drawing a map of the model landscape sites, demonstrating how the remote sensing technologies work, etc.)*

9. As groups are practicing, give them time to finish creating their remote sensing devices. Let learners know when they have five minutes remaining.

Reflect (10 min.)

10. Have groups pair up and discuss the Guiding Question on the *Our Ideas* poster: **How can we share information about our remote sensing device design with others?** *(By talking, writing, or drawing; discussing with others; making records such as videos and audio recordings, etc.)*

11. Say: **Good job working as engineers today! In the next session, you will share your designs and the information you collected with others.** Have each group discuss: **Why is it important to share what we have done and learned with others?** *(So others can build on our knowledge; so we don't make the same mistakes, etc.)*

Support Learner Differences

Some learners may disengage if the Share-Out contains too much whole-group discussion. Think about what your learners need and ensure they choose an appropriate Share-Out structure.

If you have learners who speak multiple languages, encourage them to share in their preferred languages. Circulate and ask groups: **Where can you include your preferred language or other languages you know in your share-out?** Encourage learners to make welcome signs and present in different languages spoken by the audience.

All learners should contribute to the Share-Out, but not everyone will feel comfortable presenting in the same style. Indigenous learners may feel it is inappropriate to present directly as the center of attention. Ensure nonverbal presentation methods are available, and encourage participation behind the scenes, not just in presenting in front of the class.

This discussion can be an opportunity to have learners share and learn from one another about what methods feel most comfortable for them. They can celebrate the diversity of ways in which they can communicate.

Teaching Tip

Let groups know that they will have time to finish their designs as part of preparing for the Share-Out.

Level Up!

Refer to the Engineering Design Process poster (PDF). Ask: **What phases of the *Engineering Design Process* did you use today?** *(We planned how to communicate about our remote sensing devices.)*

After the Activity

1. Clean up:

- Keep the *Our Ideas* poster for use in the Engineering Share-Out.
- Save each group's design and presentation materials, the Space Screens, and the landscape sites for the Engineering Share-Out.

2. Take time to reflect on the following educator prompt: **What methods did learners choose to present their designs? What did you learn from the methods they chose?**

Remote Sensing Additional Resources

QR code leads to resources available for this unit.

weblink: https://hov.to/248cf0d9

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