Educator Guide

Engineering Adventure 1: Safety Stories: Sharing Experiences

Educator Preview

Adventure Snapshot

Learners share experiences with, and stories about, making hazards safer.

Timing | 45 minutes

Get Ready & Team Up	10 min.
Storytelling	25 min.
Reflect	10 min.
Total	**45 min.**

Level Up Activities 5–60 min. each

Prep Snapshot*

Prep Time 30 min.

- Set up Materials Table.

**See Materials & Preparation for full info.*

21st Century Skills

Connection

- Communication

Habits of Mind

- Communicate effectively.

Guiding Question

Why is it important to make hazards safer?

Learners Will Do

Share a story or experience about a time they made a hazard safer in their home, town, or school.

Learners Will Know

Humans can make choices to make hazards safer.

Connecting Across Adventures

Ready, S.E.T., Go!	Adventure 1: Sharing Experiences	Adventure 2: Exploring Glove Uses
Last time, learners explored space trash. As scientists, they measured the energy of space trash impacts. As engineers, they designed ways to protect against those impacts.	**Today**, learners share experiences with and stories about making hazards safer.	**Next time**, learners do simple tasks wearing different gloves and compare results. Then they learn how spacesuit gloves protect astronauts from space hazards.

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/.

weblink: https://hov.to/9e7c4815

Materials and Preparation

Materials

For the educator

- *Our Ideas* poster (on paper or a shared digital document) Examples | Templates
  - index cards
  - markers
  - scissors
  - tape

For the Materials Table

- drawing supplies (such as pencils, crayons, markers)
- building supplies (such as clay, Legos, beads, natural materials)

For each learner

- Engineering Notebook (PDF)

Adventure 1 Materials Preparation (30 min.)

Ahead of Time

1. If you did not do so before the Ready, S.E.T., Go Adventure, prepare an *Our Ideas* poster by following the Prep & Setup Guide (PDF). Add the Guiding Question "Why is it important to make hazards safer?" so learners can refer to it throughout the adventure.
2. Learn about local hazards, reasons why hazards are important in local communities and cultures, and ways they are made safer. This information will help you understand learners' stories, and you can use it to provide examples and prompt learners' thinking.
3. Learn about or reflect on the storytelling styles of learners' communities. Think about the kinds of stories learners might tell and how you can structure the adventure to support them.

Teaching Tip

This adventure is the same in both the Science and Engineering Pathways. If you have already taught it in one pathway, you do not need to teach it again.

In Your Space

4. Place the *Our Ideas* poster in a location all learners can access. Make a plan to store it between activities.
5. Set up a Materials Table with the items listed in the Materials section.
6. Optional: Set the mood for the adventure by playing music.

Get Ready & Team Up (10 min.)

1. Ask: **If you did the last activity, what did you do and why?** *(As scientists, we figured out what affected energy from impacts. As engineers, we designed ways to protect spacecraft from impacts.)*
2. Say: **Our ultimate goal is to design gloves to protect astronauts against hazards in space. To start figuring this out, we're going to share what we know about hazards and how to make them safer.** Share the Guiding Question with learners aloud and in writing (using multiple languages as needed): **Why is it important to make hazards safer?**
3. Organize learners into groups of four and distribute Engineering Notebooks.

Support Learner Differences

- If learners are new to you or each other, have them share their names, name pronunciations, and other important parts of their identities. These introductions are important for all learners and can be especially relevant for Indigenous learners, multilingual learners, and learners with different physical abilities. You can also distribute index cards and have learners write anything they want you to know but do not want to share with the whole group, such as resources that will help them learn. Lead an inclusion activity that is appropriate for your group (a list of possible activities is available on pgs. xx–xxi). This tip is repeated because you may have new learners joining you in this and future sessions. Whenever you have new learners, repeat this strategy.

  For more strategies to engage learners, refer to Designing Instruction to Reach Diverse Learners, pg. x

- If you have learners who speak multiple languages, consider pairing learners with the same preferred language so they can share with each other in that language. Check out the Intentional Grouping Strategies, pg. xxii.

- If you have learners who speak multiple languages, have them discuss words for "hazards" and "safety" in their preferred languages and notice similarities between languages. If you can, provide an example from a language you know. Take time to learn learners' words and use them throughout the activities.

Storytelling (25 min.)

4. Say: **We all have stories. They can be stories we've heard from other people, stories we've watched or read about, or stories about things we have experienced ourselves. We experience stories every day in conversations, art, traditional craft, and online videos. Today, we're going to share stories about times we made a hazard safer in our homes, towns, or schools.**

5. Have learners turn to *My Safety Story*, pg. 10 in the Engineering Notebook. Say: **To start, everyone will have 15 minutes to think about a story to tell about making a hazard safer. Create some art that tells your story. You can write it down or write a poem that tells it, draw it, record it on a device, create a performance about it, or build something to demonstrate it.** Note that there are drawing and building materials on the Materials Table. During this time, check in with each group. If learners are struggling, consider sharing your own short story about hazards to spark ideas.

6. After 15 minutes, say: **Now, everyone in your group will take a few minutes to share their stories. If your story is long, you can choose one or two minutes of it to share so there is time for everyone.**

7. Allow learners to share their stories for 10 minutes. Remind them to switch so that everyone has time to share. Visit each group and listen to learners' perspectives on hazards and safety.

Reflect (10 min.)

8. Say: **Thank you for sharing your stories. They gave us great reasons why it is important to make hazards safer.** Point out common themes you noticed among stories. Emphasize how addressing hazards protects people and communities. Ask: **Is there anything else you want to share to answer the Guiding Question?** Revisit the Guiding Question: **Why is it important to make hazards safer?**

Support Thinking

Learners may want to make up their own stories. Bear in mind that the goal of the activity is to identify why making hazards safer is important to learners and communities they belong to, which made-up stories may or may not do.

Support Learner Differences

It is possible that stories about hazards may bring up trauma. If you notice this, ask the learner privately what they might need at that moment. If they do not know, you can offer some ideas from the Arizona Adverse Childhood Experiences Consortium Resource Library.

In this activity, you will need to strike a balance between allowing learners to share complete stories and ensuring there is enough time for everyone to share. Different cultures have different conventions for storytelling, which may involve very long stories with many parts, the significance of which is not immediately apparent. Consider the best way to approach time management, which may involve dedicating multiple sessions to this adventure.

You can use storytelling as an opportunity for learners to practice social skills such as taking turns and showing respect for other people's experiences.

9. Have learners record answers to the Guiding Question near it on the *Our Ideas* poster. You can
   - have each group designate a member to record responses on the *Our Ideas* poster.
   - have each learner write or draw something on a (physical or digital) index card and add it to the *Our Ideas* poster.

10. Say: **Next time, we will begin exploring how to protect astronauts' hands from hazards in space.**

After the Adventure

1. Clean up:
   - Keep the *Our Ideas* poster for Adventure 2.
   - If learners created objects related to their stories, save those objects for reference in future activities.

2. Plan for Engineering Adventure 2. See the Adventure 2 Preparation on pg. 28. Note that you will need to prepare three glove testing stations. This setup will likely take at least 40 minutes.

3. Take time to reflect on the following educator prompt. **What strategies helped learners feel comfortable sharing stories?**

Space Hazards Additional Resources

Resources include All Downloads, All Videos, Family Connections, and more.

weblink: https://hov.to/940428f7

Support Thinking

Learners may bring up ideas that will be relevant in future activities, such as clothing that protects against hazards. As appropriate, note that the group will return to these ideas.

Support Learner Differences

As needed, allow learners to choose other methods of sharing their ideas, such as audio recordings. Have them write the filename of each record on an index card and put the index cards on the *Our Ideas* poster. They will serve as placeholders. When necessary, you can ask, "Who has the idea named X?" and have the learner in question share the record.

Level Up!

- Refer to the Engineering Design Process poster (PDF). Ask: **What phases of the Engineering Design Process did you use today?** *(The ASK phase. We asked why it is important to make hazards safer.)* (5 min.)
- Check out some great examples of the more than 2,000 NASA spin-off technologies that enrich our lives–and keep us safe–thanks to space exploration. (5 min.)
- Tell learners, if anyone asks them what they did today, they can tell them "We shared stories about why it is important to make hazards safer." (5 min.)