

Engineering Activity 9: Sum It Up: Engineering Share-Out

Educator Preview

Activity Snapshot

Learners communicate their ideas about designing a water reuse process in the Engineering Share-Out.



Timing | 45 minutes

Get Ready & Team Up 10 min.
 Engineering Share-Out 25 min.
 Reflect 10 min.
Total 45 min.
Level Up Activities 5 min. each



Prep Snapshot*

Prep Time 15 min.

- Space Need: Sink
- Set up Materials Table.
- Invite people to Share-Out.

**See Materials & Preparation for full info.*



21st Century Skills

Connection

- Collaboration
- Communication

Habits of Mind

- Communicate effectively.



Guiding Question

How can we share our water reuse process recommendations with others?

Learners Will Do

Share design recommendations for engineering a water reuse process.

Learners Will Know

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



Connecting Across Activities

Activity 8: Preparing for the Engineering Share-Out	Activity 9: Engineering Share-Out	Science Pathway
Last time , learners prepared to communicate their ideas about designing a water reuse process in the Engineering Share-Out.	Today , learners communicate their ideas about designing a water reuse process in the Engineering Share-Out.	Next time , learners will experience the science of this topic in the Water in Extreme Environments Science Pathway (optional).

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/f75ae3d6>

Materials and Preparation

Materials

For the whole group

- *Our Ideas* poster (on paper or a shared digital document) in Prep & Setup Guide (PDF)
[Examples](#) & [Template](#)
- chart paper and markers
- remaining materials from Activity 7
- 1 measuring cup, 1/4 cup
- 2 tablespoons
- 8 craft sticks
- 8 containers, 1/2 gallon, with water samples
- 60 plastic cups, 8 oz.
- all tactile, audio, and video resources needed for the Share-Out

For each group of 4

- 1 foil tray, 12" × 12"
- 1 measuring cup, 1 cup
- 1 packet of pH strips
- 1 pair of scissors
- 1 set of [Engineering Activity 6 Water Reuse Plan Location and Filter Base Cards, pgs. 93-94](#)
- 2 Filter Bases

For each learner

- [Engineering Notebook \(PDF\)](#)

Activity 9 Materials Preparation (15 min.)

Ahead of Time

1. Invite people from the community, including families and friends of learners, to the Engineering Share-Out using the [Engineering Activity 8 Share-Out Invitation \(PDF\)](#).
2. Decide what to do with learners' designs and presentation materials after the activity.

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 Activity 8.
5. If needed, prepare more water samples in the containers using [Water Samples for Final Challenge Recipes, pgs. 87-88](#).



Teaching Tip

Lead this activity in a room with a sink for easy setup.

Activity Guide

Get Ready & Team Up (10 min.)

1. Ask: **If you did the last activity, what did you do and why?**
(We prepared to share our water reuse processes at the Engineering Share-Out.)



Support Learner Differences

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



2. Share the Guiding Question with learners aloud and in writing on the *Our Ideas* poster (using multiple languages as needed): **How can we share our water reuse process recommendations with others?**
3. Organize learners into their groups of four from Activities 6–8.
4. Give learners five minutes to set up for the Share-Out so they can present in the ways that they have planned.

Engineering Share-Out (25 min.)

5. When learners are ready, invite guests into the room and explain how the Share-Out will proceed. Carry out the steps of the Share-Out as the group has planned.



Support Learner Differences

To ensure the Share-Out is accessible as possible, provide tactile, audio, and video resources from throughout the pathway to attendees as appropriate.



6. As they experience the Share-Out, invite families and other guests to think about their family, cultural, or other knowledge related to what they observe and share that knowledge with learners individually or the event as a whole.
7. Ask or encourage attendees to ask the following questions: **What are some things you investigated to help you solve this problem? What part of your process worked really well? What didn't work so well? How did the Engineering Design Process help you reach this final design? What suggestions do you have for other people designing water reuse processes?**
8. At the end of the Share-Out, congratulate your group on doing a great job communicating and being engineers. Have learners thank attendees before concluding.

Reflect (10 min.)

9. Have groups discuss the following questions: **What are you most proud of doing as part of this engineering group? Are there other water conservation problems you would like to solve as an engineer? Why do you consider yourself an engineer?**

10. Have learners discard used filter materials (except charcoal, limestone and other reusable materials) and their final water samples, then rinse their Filter Bases and place them in their trays.



Level Up!

- ✦ Tell learners, if anyone asks them what they did today, they can tell them “We shared design recommendations for water reuse processes.” (5 min.)
- ✦ Ask: **Which engineering design process phases were most helpful to you? Can you imagine other problems you might solve using an engineering design process?** (5 min.)
- ✦ If your learners enjoyed this planetary engineering design challenge, they would also enjoy the Rover Observation and Discoveries in Space (ROADS) student challenges. Show your learners the [NASA National Student Challenges](#). (15 min. to review weblink, 10–15 hours per challenge)

After the Activity

1. Clean up:
 - Collect the Engineering Notebooks.
 - Decide if you want to keep the *Our Ideas* poster.
 - Reset the space in which you held the Share-Out.
 - Consider saving materials for when you conduct this activity in the future. Rinse and set aside the limestone, charcoal, filter bases, and aluminum trays. Once dry, store any loose materials in airtight containers.
2. Take time to reflect on the following educator prompt. **How did learners use the *Our Ideas* poster throughout the pathway? If you taught the pathway again, would you use the poster differently?**

Water in Extreme Environments Additional Resources

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



weblink: <https://hov.to/7cb5c428>