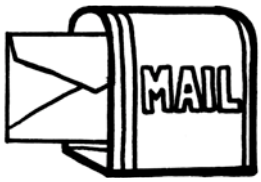
Engineering Showcase: In Good Hands

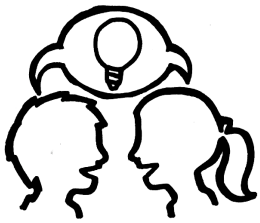
Overview: Kids will present their designs and share how they used the Engineering Design Process to engineer model space gloves suited for their chosen mission.

Note to Educator: The Engineering Showcase is a chance for groups to share their technologies with staff members, families, and friends! Encourage kids to invite guests. This will help kids take ownership of their designs and the Engineering Design Process they used. Consider setting up the Testing Stations for the Showcase if kids want to share the Mission Simulations.

Duo Update (5 min)

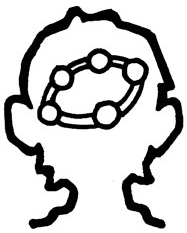


Set the Stage (15 min)



Activity (20 min)

Reflect (5 min)



Materials

For the entire group:

- ☐ *Message from the Duo*, track 10 or Engineering Journal, p. 33
- ☐ *Engineering Design Process* poster

For each group of 3 kids:

- ☐ final model space glove designs from Adventure 6
- ☐ Optional: previous model space glove designs from Adventure 5
- ☐ Optional: 10 pipe cleaners

For each kid:

- ☐ Engineering Journal

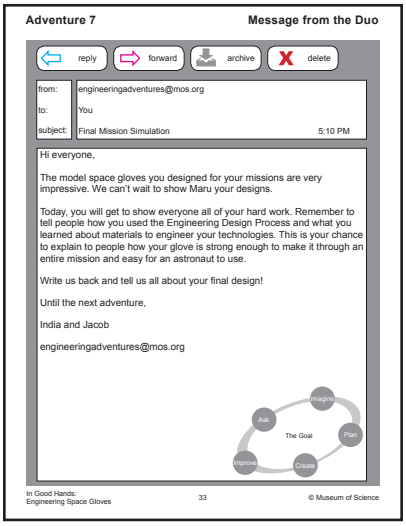
Preparation

Time Required: 5 minutes

1. Post the *Engineering Design Process* poster.
2. Have the *Message from the Duo* ready to share.
3. Optional: Preview 1 or 2 videos that teach kids how to give a successful presentation. Plan to show and discuss the video with groups after the *Message from the Duo* and just before groups begin to prepare their presentations.

Journal Pages for Prep Adventure 7

Message from the Duo, p. 33



Adventure 7 — Message from the Duo

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from: engineeringadventures@mos.org
to: You
subject: Final Mission Simulation 5:10 PM

Hi everyone,

The model space gloves you designed for your missions are very impressive. We can't wait to show Maru your designs.

Today, you will get to show everyone all of your hard work. Remember to tell people how you used the Engineering Design Process and what you learned about materials to engineer your technologies. This is your chance to explain to people how your glove is strong enough to make it through an entire mission and easy for an astronaut to use.

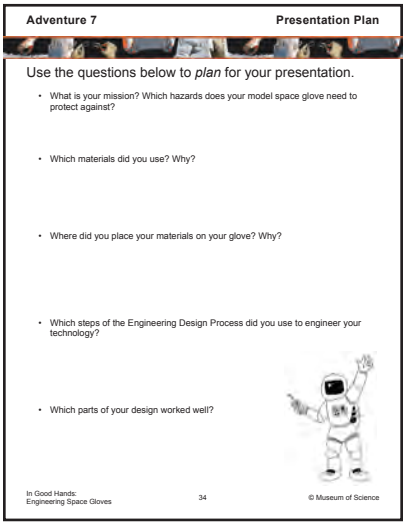
Write us back and tell us all about your final design!

Until the next adventure,

India and Jacob

engineeringadventures@mos.org

Presentation Plan, p. 34

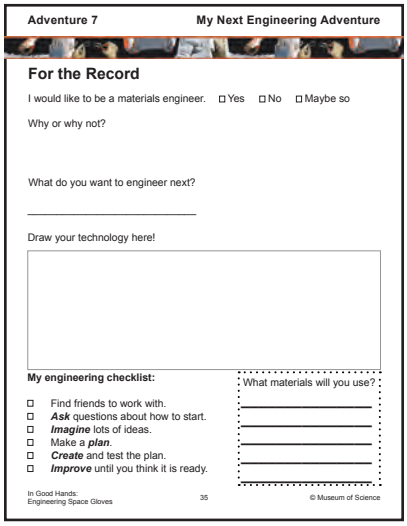


Adventure 7 — Presentation Plan

Use the questions below to *plan* for your presentation.

- What is your mission? Which hazards does your model space glove need to protect against?
- Which materials did you use? Why?
- Where did you place your materials on your glove? Why?
- Which steps of the Engineering Design Process did you use to engineer your technology?
- Which parts of your design worked well?

My Next Engineering Adventure, p. 35



Adventure 7 — My Next Engineering Adventure

For the Record

I would like to be a materials engineer. ☐ Yes ☐ No ☐ Maybe so

Why or why not?

What do you want to engineer next?

_____

Draw your technology here!

My engineering checklist:

- ☐ Find friends to work with.
- ☐ ***Ask*** questions about how to start.
- ☐ ***Imagine*** lots of ideas.
- ☐ Make a ***plan***.
- ☐ ***Create*** and test the plan.
- ☐ ***Improve*** until you think it is ready.

What materials will you use?

_____
_____
_____
_____
_____

Example Glove Display

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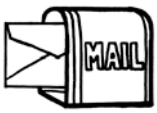
Kids will learn:
- They used all the steps of the Engineering Design Process to engineer a model space glove.
- Everyone can engineer!



Present the Message from the Duo (5 min)

1. Explain to kids that it is important for engineers to share the technologies they *create* with other people. Let kids know that today they will be presenting their model space gloves to a real audience. India and Jacob sent a message to tell them more.
2. Have kids turn to *Message from the Duo*, p. 33 in their Engineering Journals, to follow along. Play track 10.
3. To check for understanding, ask:
   - **What are India and Jacob asking us to do?** *Share how we used the Engineering Design Process and present our model space gloves.*

Prepare (15 min)

1. Explain that groups will have 15 minutes to fix any parts of their designs that may have been damaged during their final test in the previous adventure. They can also spend this time deciding what they would like to say as they present their designs.
2. Have groups turn to *Presentation Plan*, p. 34 in their Engineering Journals, to see the questions they will be asked. Encourage groups to take notes if they would like.
3. Give groups 15 minutes to prepare their model space gloves and presentations. As groups are working, check in and make sure they are ready to present.

Tip: If groups are interested, have them display both their model gloves from Adventure 5 and their final model gloves from Adventure 6, and have them explain how they *improved* their designs.

Tip: Have groups use 10 pipe cleaners to create a stand to display their model glove(s). See p. 84 in this guide for an example.

Engineering Showcase (20 min)

1. To begin the Showcase, have a volunteer explain the challenge to the audience, including the different missions.
2. Have groups take turns presenting their model space gloves. Ask questions like:
   - **What is your mission?**
   - **Which hazards does your model space glove need to protect from?**
   - **Which materials did you use? Why?**

- **Where did you place your materials on your glove? Why?**
- **Which steps of the Engineering Design Process did you use to engineer your technology?**
- **Which parts of your design worked well?**

3. After each group has had an opportunity to share, give the audience time to circulate among the groups and ask them questions about how they would *improve* their designs.

Reflect (5 min)

1. Once the Showcase is complete, gather kids around the *Engineering Design Process* poster and ask:
   - **What did you learn about space hazards and materials engineering?**
   - **Which step of the Engineering Design Process helped you most as you were engineering your model space gloves?**
   - **Do you think you will use the Engineering Design Process again?**
   - **What does engineering mean to you?**
2. Congratulate kids on all of their great materials engineering work! Have them make their final entry on *My Next Engineering Adventure*, p. 35 in their Engineering Journals.

Extension (30 min)

In this extension activity, kids use what they have learned in the unit to create a new mission with specific criteria and constraints. Then they compare the results from their new mission with the first mission's data. By doing so, kids learn not only how engineers design technology but also how they figure out the most effective way to test it.

1. Revisit *Mission Profiles*, pp. 21–23, in the Engineering Journal.
2. Using the mission profiles as a guide, have groups plan a new mission with specific criteria and constraints.
3. Explain to groups that they will have the same tests for cold temperature, dust, and impact.
4. Have groups test their model space gloves using the new mission's criteria and constraints.
5. Have groups compare results from their new mission with the first mission's data.
6. Discuss how engineers not only design technology, but also must figure out the most effective way to test it.

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5:10 PM

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