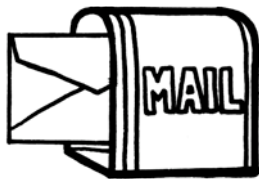




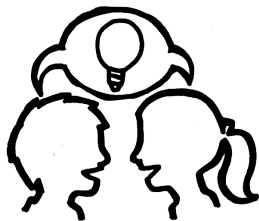
**Overview:** Kids will *improve* their model space gloves and test them in a final Mission Simulation.

**Note to Educator:** Remind kids that they should work to *improve* their model space gloves and complete the final Mission Simulation during this adventure. Be sure to save all the model space gloves that groups design for Adventure 7, the Engineering Showcase, and invite staff, family, and community members to attend.

Duo Update (5 min)



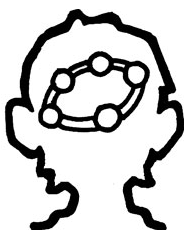
Set the Stage (2 min)



Activity (35 min)



Reflect (3 min)



## Materials

### For the entire group:

- Message from the Duo*, track 9 or Engineering Journal, p. 28
- Engineering Design Process* poster
- Testing Results* chart
- chart paper and markers

### Materials Table:

- leftover materials from Adventure 5

### Mission Simulation:

- Testing Stations from Adventure 5
- Mission Simulation Set Up*, p. 63 in this guide
- Mission Profile Images*, pp. 73–77 in this guide

### For each group of 3 kids:

- model space glove designs from Adventure 5
- 1 pair of scissors

### For each kid:

- Engineering Journal

## Preparation

*Time Required: 30 minutes*

1. Post the *Engineering Design Process* poster and *Testing Results* chart.
2. Have the *Message from the Duo* ready to share.
3. Set up a Materials Table with the materials listed above.
4. Prepare the Mission Simulations by copying the *Mission Profile Images*, pp. 73–77 in this guide, and following the directions on *Mission Simulation Set Up*, p. 63 in this guide.

# Journal Pages for Adventure 6

## Message from the Duo, p. 28

**Adventure 6** **Message from the Duo**

reply forward archive delete

from: engineeringadventures@mos.org  
to: You  
subject: Mission Ready? 3:12 PM

Hi engineers,

We can tell you've been working really hard on the model space gloves you've been designing for the different missions!

Your model space gloves should combine materials to help protect from different hazards and pass the final test to make sure your gloves are strong enough to last the entire mission and are easy for astronauts to use. Maru explained that engineers have to choose materials wisely to make sure they meet all of their goals as best as they can. That means engineers are always testing and *improving* their technologies. Share your ideas with each other and see if you can *improve* your model space gloves to make them even better!

Next time, you'll get to share your model space gloves with an audience in the Engineering Showcase. To help you prepare, you can work on any improvements you need to make and do a final Mission Simulation to make sure your designs are mission ready before you show them off. We can't wait to see your final designs!

India and Jacob

In Good Hands: Engineering Space Gloves 28 © Museum of Science

## Improved Plan, p. 29

**Adventure 6** **Improved Plan**

How can you improve your model space glove to make it even better? Draw your ideas and label the changes to your design.

**PALM**

**BACK**

Will you change where you place the materials? Will you change the materials? Why will you make these changes?

In Good Hands: Engineering Space Gloves 29 © Museum of Science

## Simulation Results: Improve, pp. 30–32

**Adventure 6** **Simulation Results: Improve**

**Moon**  
How well did your glove perform in the tests below?

**Cold:** Record your results. Circle how well your model space glove protects against the cold.

Starting Temperature	Temperature after 30 Seconds	Difference in Temperature

Not Good	Good	Great
7 °C or more	3–6 °C	0–2 °C

**Dust:** Circle how well your model space glove protects against dust.

Not Good	Good	Great
4+ areas	2–3 areas	0–1 area

**Final Test:**  
Were you able to open the jar, remove the equation, and type it into the calculator?  
Yes No  
Did your glove stay together after testing?  
Yes No

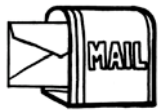
**Did You Know?**  
Other than Earth, the Moon is the only place in the solar system where humans have set foot.

In Good Hands: Engineering Space Gloves 32 © Museum of Science



### Kids will learn:

- They can choose materials that work together to meet multiple criteria.
- Designs do not always work the first time, and they can learn from failure.
- Using the *improve* step can help them refine their design after testing.



### Present the Message from the Duo (5 min)

1. Tell kids that India and Jacob sent them another message about their model space gloves. Have kids turn to *Message from the Duo*, p. 28 in their Engineering Journals, to follow along. Play track 9.
2. To check for understanding, ask:
  - **What are India and Jacob asking you to do?** *To improve our model space gloves so they can protect astronauts from multiple hazards on one of the missions.*



### Set the Stage (2 min)

1. Remind kids that next time they will have the opportunity to share their model space glove designs at the Engineering Showcase. During the Showcase, they will explain the mission that their group chose and present their model space gloves to an audience of their peers, staff, families, and community members.
2. Explain that today they will have time to continue *creating* their model gloves and make their final improvements to prepare for the Showcase.



### Improve (35 min)

1. Have groups revisit the results of their first Mission Simulation on *Simulation Results*, pp. 25–27 in their Engineering Journals. Ask:
  - **How can you *improve* your design to make it even better?**
2. Have groups record their ideas on *Improved Plan*, p. 29 in their Engineering Journals.
3. When groups are ready, have them *improve* their model space gloves.
4. Some gloves may have been damaged during testing and this is okay. Let kids know that if this happens, they will need to repair or *create* a new model space glove to test and display in the Showcase.
5. Remind groups that they can use up to 3 materials to design their gloves, as well as scissors and up to 3 feet of tape.
6. As groups *improve* their designs, circulate around the room and ask:
  - **What parts of your design are you *improving*?**
  - **How are the materials working together in your glove design?**

**Tip:** If groups are interested, allow them to try using a food-safe glove as a base instead of the vinyl glove.



- **How do you think your *improved* glove will protect from each of the hazards the astronauts will encounter on their mission?**
7. When groups are ready, have them move to the Testing Stations to test their *improved* designs in a final Mission Simulation.
  8. Have kids record the results of their test on *Simulation Results: Improve*, pp. 30–32 in their Engineering Journals.
  9. After all groups have tested their *improved* model space gloves in the final Mission Simulation, collect groups' model space gloves and store them in a safe place so they can be used in the Engineering Showcase.

**Tip:** Groups may want to use their first model space glove and *improved* glove in the Engineering Showcase to show how their ideas changed, so encourage groups to save both designs.



### Reflect (3 min)

1. Gather kids together near the *Engineering Design Process* poster. Ask:
  - **How did you use the Engineering Design Process today?** *We used the create step to keep building and testing our gloves. We used the plan and improve steps to decide how we could make our designs better.*
2. Remind kids that in the next adventure they will get to share their designs with an audience. They will present what they learned about materials, space hazards, and how they used the Engineering Design Process to engineer their model space gloves.
3. If possible, encourage kids to invite their families and friends to the Showcase.
4. Congratulate kids on their excellent engineering work!



reply



forward



archive



delete

from:

engineeringadventures@mos.org

to:

You

subject:

Mission Ready?



3:12 PM

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India and Jacob

