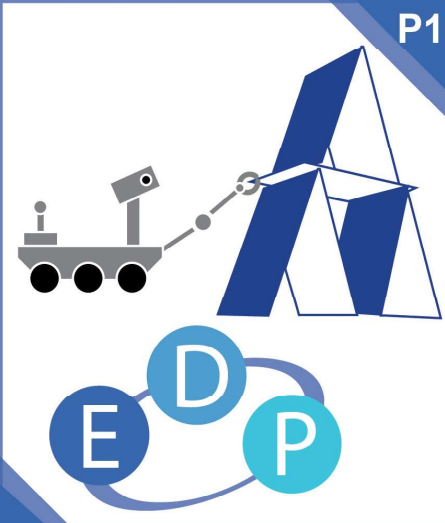# Learning Progression - Prep Activities

These adventures introduce youth to engineering, an engineering design process (EDP), and the curricula's definition of technology.

P1

What is Engineering?
Create a Tower

Purpose

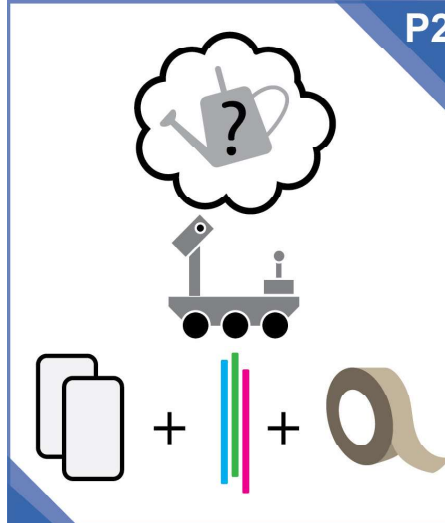Youth engage in an engineering design challenge using an Engineering Design Process (EDP).

Key Take Away

We are engineers.

Engineering Reflection

Today we used an EDP to solve a problem.

P2

What is Technology?
Create a Technology

Purpose

Youth consider the definition of technology as any thing or process that humans (engineers) design to solve a problem.
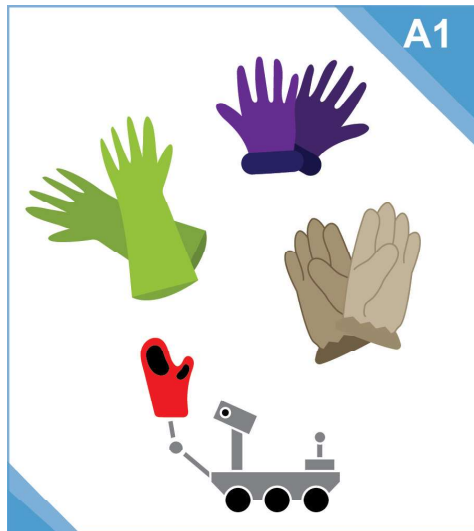
Key Take Away

Anything designed by humans to solve problems is a technology.

Engineering Reflection

Today we asked how we can design technologies to solve everyday problems.

Learning Progression - Engineering

In these adventures, youth investigate various glove materials. They find that different materials are good for different uses and protect against different hazards.

A1 — Everyday Gloves
Test Gloves for Different Uses

Purpose

Youth investigate multiple glove types to determine which are better for certain tasks.

Key Take Away

We can identify which gloves are best for which uses.

Engineering Reflection

Today we asked which common household gloves are best for certain tasks. We tested them and compared the results to answer our question.

A2 — Chilling Out
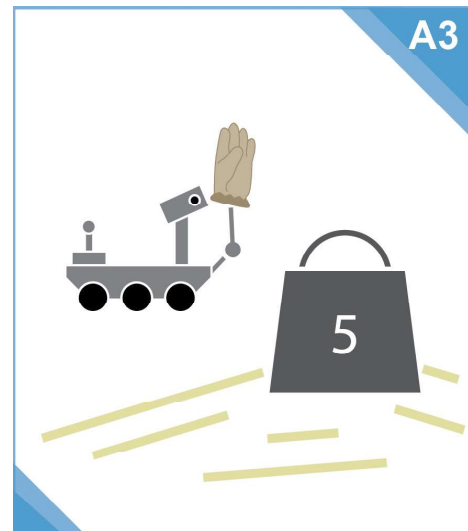### Test Materials for Cold

Purpose

Youth explore how well different materials insulate against cold.

Key Take Away

We can identify materials to use in making a glove that protects against cold.

Engineering Reflection

Today we asked which materials are better at insulating against the cold. We tested and compared the results to answer our question.

A3 — Ready for Impact
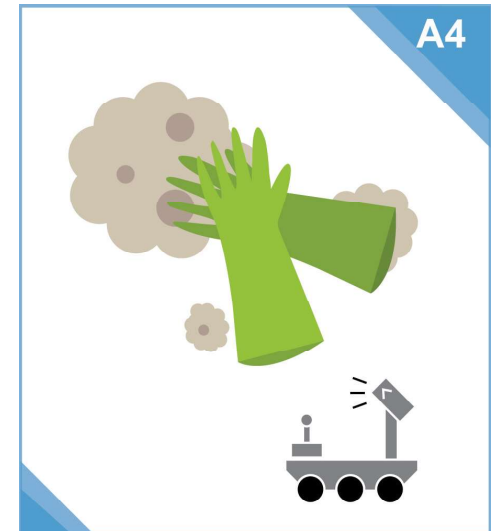### Test Materials for Impact

Purpose

Youth explore how well different materials protect against impact.

Key Take Away

We can identify materials to use in making a glove that protects against impact.

Engineering Reflection

Today we asked which materials are better at protecting against impact. We tested and compared the results to answer our question.

A4 — Dangerous Dust
Test Materials for Dust

Purpose

Youth explore how different materials resist or collect dust.

Key Take Away

We can identify materials to use in making a glove that doesn't pick up as much dangerous dust.

Engineering Reflection

Today we asked which materials are better at not picking up dangerous dust. We tested and compared the results to answer our question.

Learning Progression - Engineering

In these adventures, youth apply what they learned in adventures 1-4 to design, improve, and share their space glove. Each is made to protect against hazards for a specific space environment.
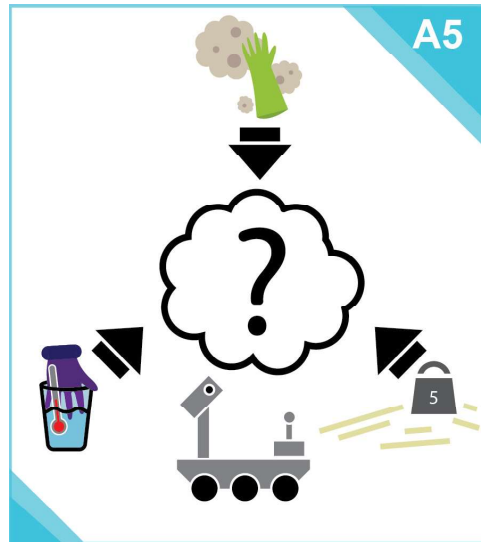
A5

Create a Space Glove
**Plan, Create, Test**

Purpose

Youth apply what they learned in prior adventures to plan, create, and test a space glove designed for a space mission and its associated hazards.

Key Take Away

We can engineer a glove that protects us from certain space hazards and can be used to perform mission tasks.

Engineering Reflection

Today we used data from prior investigations to imagine, create and test a space glove for use in a space environment.
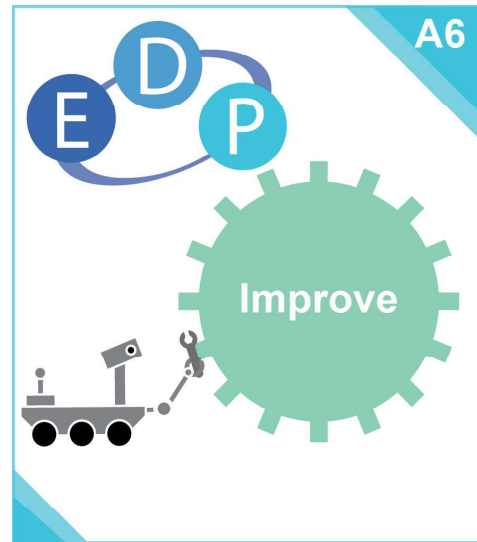
A6

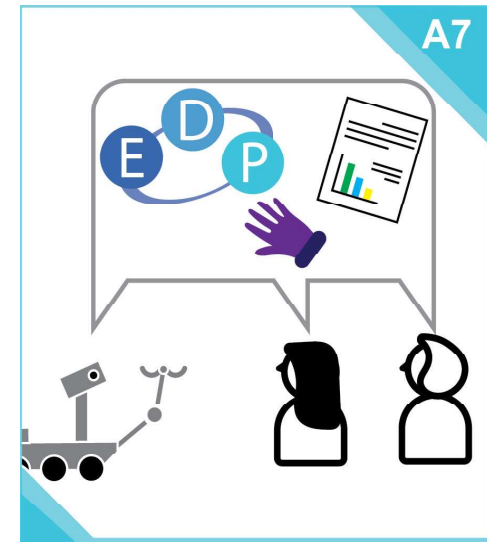### Improve a Space Glove
Improve a Technology

Purpose

Youth improve their glove for more agility, strength, or to better protect against the hazards of their space environment.

Key Take Away

We can improve technologies we have designed.

Engineering Reflection

Today we improved our space glove. Mistakes help engineers learn and then improve technology.

A7

Engineering Showcase
Communicate Results

Purpose

Youth prepare presentations to communicate their space glove design to others.
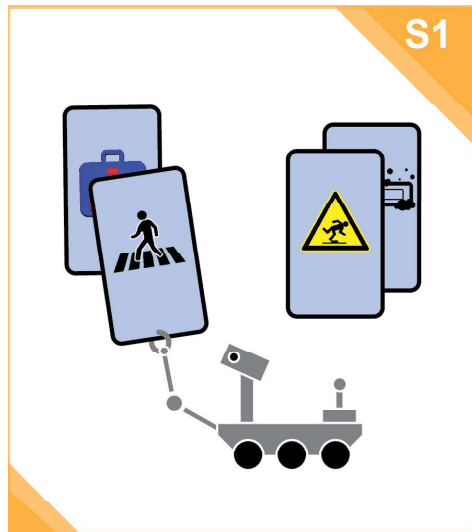
Key Take Away

We can communicate how we designed our space glove using an EDP.

Engineering Reflection

Today we communicated our space glove technology and how we used an EDP to design it.

Learning Progression - Science

In these adventures, youth explore hazards on earth and in space and how we mitigate them. Youth present hazards and mitigations for a specific mission.

S1

Everyday Hazards
Everyday Hazards Card Game

Purpose

Through a card game, youth are introduced to these concepts: hazards are dangers and mitigation is a way to lessen the danger.

Key Take Away

There are many everyday hazards and many ways we can mitigate or protect ourselves against them.

Science Reflection

Today we explored everyday hazards and different strategies that humans have developed to mitigate them so they aren't so dangerous.

S2

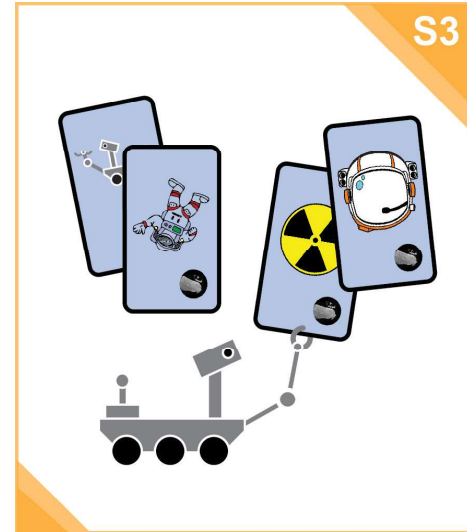### Hazards on Earth
Earth Hazards Card Game

Purpose

Youth are introduced to natural hazards as dangers and mitigation on Earth through a card matching game.

Key Take Away

There are natural hazards on Earth and humans have developed ways to mitigate some of them

Science Reflection

Today we learned about different natural hazards on Earth and different strategies that humans have developed to mitigate them.

S3

Hazards in Space
Space Hazards Card Game

Purpose

Youth explore different hazards and mitigations in space and learn that some are the same as they are on Earth.

Key Take Away

There are many hazards in space and ways to mitigate them. Some are the same as for the Earth, Moon, or Mars, and others are different.

Science Reflection

Today we learned about different hazards in space and different strategies that humans have developed to mitigate them.

S4

Mitigate Hazards
For Your Mission

Purpose

Youth investigate the hazards and mitigations that apply to a specific mission and learn that they are different for human versus robotic missions.

Key Take Away

If people want to explore space, they need to mitigate hazards. Different types of missions require different hazard mitigations.

Science Reflection

Today we explored how we can use information and technology to keep astronauts and equipment safe while exploring space.