

Introduction: The Engineering Design Process

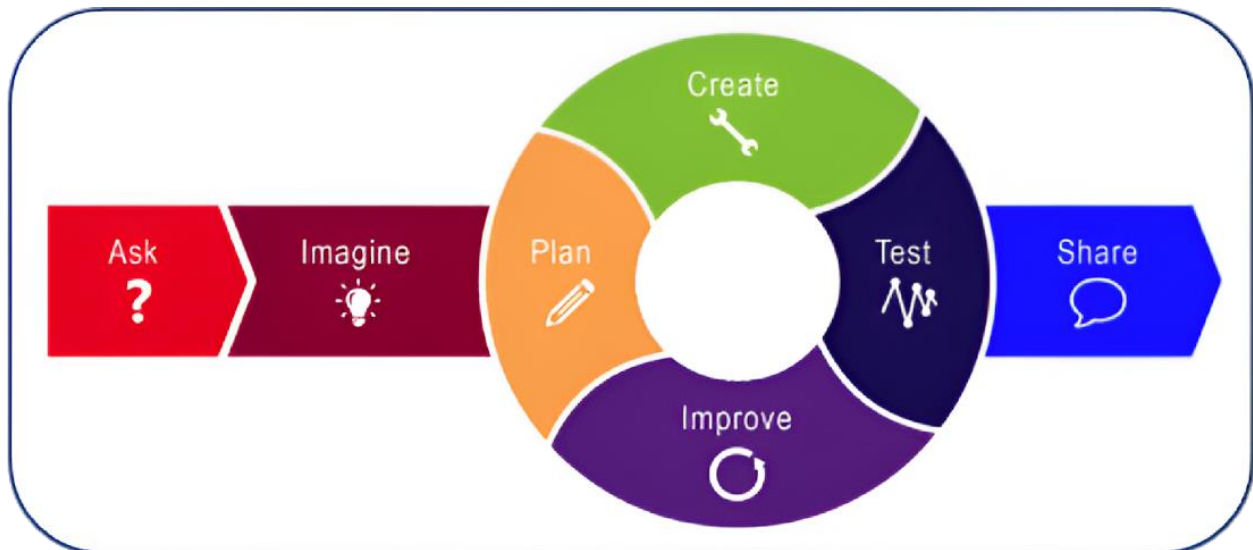
A very important part of invention and exploration is engineering. **Engineering** means creating solutions to real-world problems or questions. This process is a key part of inventing, building, and discovering new things.

Scientists at NASA use engineering all the time. They design and create tools to help them explore space and live in space stations. These tools include big objects, like rockets and rovers, and smaller things, like tools and spacesuits. There are many different missions NASA has created to learn about space. Keep an eye out for all the ways these scientists have used engineering!

In this challenge and in *Our Home in Space*, you practice engineering and work through all the steps of the engineering process. Then, you will have a real engineering solution to a problem, just like the scientists at NASA!

Here are the steps of the engineering process that NASA uses:

1. Ask questions and define problems.
2. Imagine possible solutions to the problem.
3. Plan a design for one of your possible solutions.
4. Build the solution you designed.
5. Test your solution.
6. Improve your solution by analyzing the results of your test.
7. Design, build, test, and improve again to get the best solution.
8. Communicate the results of your testing and improvement.



NASA's engineering design process ("*Habitation Gateway*" STEM Guide).

Engineering Design Process Questions

1. What is engineering?
 - a. building machines with engines
 - b. sending people and tools to space
 - c. creating solutions to problems or questions
 - d. completing experiments in a specific order or process
2. How do scientists at NASA use engineering?
 - a. to analyze data that spacecrafts collect
 - b. to design and create tools like rockets and spacesuits
 - c. to select which candidates are chosen to be astronauts
 - d. to share their questions with other scientists around the world
3. Select the **4** steps that are repeated in the engineering process:

<input type="checkbox"/> ask	<input type="checkbox"/> test
<input type="checkbox"/> plan	<input type="checkbox"/> build
<input type="checkbox"/> share	<input type="checkbox"/> improve
4. Which list has the steps of the engineering process in the correct order?
 - a. define, imagine, design, build, test, improve, repeat, communicate
 - b. imagine, define, design, build, improve, test, repeat, communicate
 - c. imagine, design, define, build, improve, repeat, test, communicate
 - d. define, design, imagine, build, repeat, test, improve, communicate
5. How do engineers improve their solutions?
 - a. by analyzing the results of a test
 - b. by building many solutions at the same time
 - c. by asking questions before they plan a design
 - d. by communicating with other scientists during the process
6. Why do you think communicating results is a key step of engineering?
