PROBLEM STATEMENT
Engineers think about problems, ask questions and then explore solutions. To creation solutions they design, create and test many possible models. Testing and reviewing the results of the test helps make the design better the next time, this is called iteration. In this activity you are going to be an engineer, too! All you must do is use the engineering design process. The parts do not always go in order, you can start, stop and re-start at any part of the process as you learn new things!

CRITERIA & CONSTRAINTS
- Practice being an engineer by designing a solution to a problem.
- How will you solve this problem? Think of some solutions.
- Join with others to think of ways to make them better!
- Use your core values to work together on this solution.

ENGINEERING DESIGN PROCESS & FIRST CORE VALUES
Explore FIRST® Core Values

Engineering Design Process
Explore – The problem
Create – Solutions to the problem
Test – Find ways to test your solutions
Share – Communication what you learned
BUILDING THE BACKGROUND & BRAINSTORMING

Start **EXPLORING** your engineering journey here

- Watch [PBS Kids](https://www.pbs.org/kids) and learn how Design Remix works.
- What are some items in your home that could be improved?
- Could you use the engineering design process to make it better?

**SKETCH YOUR DESIGN**

Choose an object in your home to do a design remix.

What is the purpose of this object?

**CREATE** - brainstorm and compete your design below.

<table>
<thead>
<tr>
<th>Brainstorming</th>
<th>Your Design</th>
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</thead>
</table>

**TEST** – Optional build a model of your design and see how well it works

**SHARE** – Determine who is on your design team, share your design and have them add on their ideas. If they are doing the same activity, they will share a design with you!

Who is on your design team?

**REFLECTION QUESTIONS**

1. Why did you choose this design?

2. What problem did you try to solve?

3. How did the engineering design process help you think about your design?
GO FURTHER!
- Have more than one person improve upon your design.
- Build a prototype if you have not already.
- Do the design remix activity on [PBS Kids](https://pbskids.org) and participate in design activities.
- Create your design using [computer aided design software](https://www.firstinspires.org).

### CORE VALUES SELF-REFLECTION

<table>
<thead>
<tr>
<th></th>
<th>Amazing Skill</th>
<th>Great Job</th>
<th>Making Progress</th>
<th>Could Be Better</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discover</td>
<td>I approached the tasks looking for all possible answers independently and used perseverance to discover the answer on my own.</td>
<td>I approached the tasks and asked questions from one other person but persevered to discover the answer on my own.</td>
<td>I approached tasks but needed assistance multiple times to reach a point of discovery.</td>
<td>I depended on others to make the discovery for me.</td>
</tr>
<tr>
<td>Innovation</td>
<td>I used creativity and perseverance to solve problems on my own, coming up with unique solutions for the tasks I was given.</td>
<td>I used creativity and perseverance to solve problems on my own coming up with different solutions for the tasks I was given.</td>
<td>I used creativity but struggled with perseverance to solve problems on my own.</td>
<td>I struggled with being creative and only used the information given and needed a lot of encouragement from others to complete the task.</td>
</tr>
<tr>
<td>Impact</td>
<td>I approached the tasks applying understanding of the information with the impact it can have on me and my future as well as how I could help others.</td>
<td>I approached the tasks knowing and applying the information with impact it can have on me and my future.</td>
<td>I understand the tasks but struggle to apply how it will help me in my future or to influence others.</td>
<td>I understand the tasks but did not approach it with understanding the impact it can have on my future or others.</td>
</tr>
<tr>
<td>Inclusion</td>
<td>I approached all tasks with inclusion of others’ ideas, I showed tremendous kindness by including others’ views in my projects and work. I approached my solution thinking how all people would interact with the solution.</td>
<td>I approached most with inclusion of others’ ideas, I tried to understand others’ views and include them in my projects and work. My solution mostly incorporates needs of others.</td>
<td>I approached some tasks with inclusion of others’ ideas, I tried to understand others’ views and include them in my projects and work. My solution meets only a few needs of others.</td>
<td>I did not approach tasks with inclusion of others’ ideas, I tried to understand others’ views and include them in my projects and work. My solution is not inclusive of different types of people.</td>
</tr>
<tr>
<td>Teamwork</td>
<td>I used collaboration, communication and project management to get all tasks accomplished for myself as well as the others.</td>
<td>I used collaboration, communication and project management to get most tasks accomplished for myself as well as the others.</td>
<td>I used collaboration, communication and project management to get some tasks accomplished for myself as well as the others.</td>
<td>I only sometimes used collaboration, communication and project management and accomplished a few tasks for myself as well as the others.</td>
</tr>
<tr>
<td>Fun</td>
<td>I kept a positive attitude throughout and found opportunities to have fun even through struggle. I looked for additional opportunities to have fun in my tasks.</td>
<td>I kept a positive attitude throughout and found opportunities to have fun even through struggle.</td>
<td>I saw the enjoyment and fun after the activity but struggled to see it during.</td>
<td>I only saw struggle in completing my tasks and did not look for times to have fun.</td>
</tr>
</tbody>
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