

Major Project - Phase 1

1. Identify the “Big” concept to be covered by the engineering design challenge.

- The engineering design process can provide a structure to find the best solutions to problems and help others.

2. Research appropriate learning standards associated with the topic.

- **MS-ETS1-1:** Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- **MS-ETS1-2:** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

3. Identify and discuss the different types of problem solving and declarative/procedural knowledge needed.

- The problems will be “moderately structured problems”. There will be multiple possible solutions / designs.
- Declarative knowledge: students will need to know the constraints and the end goal.
- Procedural knowledge: students will need to know the steps they need to take to complete the activity.

4. Explore objectives and ancillary concepts/content covered by the project.

- Students will be able to work in teams and build on each others’ ideas while brainstorming.
- Students will be able to complete the engineering design process and reflect on how it went.
- Students will develop an understanding of the attributes of design.
- Students will develop an understanding of engineering design.
- Students will create solutions to problems by identifying and applying human factors in design.

5. Identify possible activities.

- “Harmless Holder”:
<https://pbskids.org/designsquad/build/harmless-holder/>
- “Build a Better Lunch Box”:
<https://pbskids.org/designsquad/build/build-better-lunchbox/>
- “The Sneaker Challenge”:
<https://pbskids.org/designsquad/build/sneaker-challenge/>
- Solving Everyday Problems Using the Engineering Design Process:
<https://www.teachengineering.org/activities/view/usu-1961-everyday-problems-introduction-engineering-design>

6. Select the best activity for your classroom.

- “The Sneaker Challenge”:
<https://pbskids.org/designsquad/build/sneaker-challenge/>
- The timing aligns really well to an assembly we just had at our school about “Choosing Kindness”. Students are currently collecting and donating sneakers to spread kindness with a local charity. This challenge is a great opportunity for them to push this idea to the next level and think about the impact their designs can have.