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

How can students model and oil spill and remediation of said oil spill?

2. Research appropriate learning standard**NEXT GENERATION SCIENCE STANDARDS:**

HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.*s associated with the topic.

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

Students will need to simulate an oil spill and try different methods to clean it up. But it is not just about the science. Students will also have to be efficient as they will have to take into account how much “money” they are spending in the way of supplies they are using to clean up the spill. They are looking to be efficient.

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

Students will learn about how different contaminants affect the environment and different real world scenarios where oil spills needed to be remediated. Students will learn the methods that scientists use to remediate these situations. Students will learn about superfund sites.

5. Identify possible activities.

The remediation activity from https://engineeringtomorrow.org/labs will be used and modified to fit our students. This organization will provide free supplies.

6. Select the best activity for your classroom.

Engineering tomorrow will provide free supplies such as

- Vegetable oil
- Sugar
- 2 craft feathers
- Materials to construct remediation technologies
    - Popsicle sticks
    - Plastic straws
    - Duct tape
    - Plastic spoon
    - Disposable cup
    - Cotton balls
    - Paper towels
    - Dawn dish soap
    - Etc.
- Yeast
- 1 beaker/graduated cylinder
- 1 balloon
- 1 plastic water bottle

to model the real world process of remediation. Students will learn different methods and research costs and materials to figure out which works best for them.