Optional Engineering Project

If you would like to do an engineering project, start by watching this video about the engineering design process. Then look through this whole packet and you'll be ready to get started!

Look Around...

What interests you?

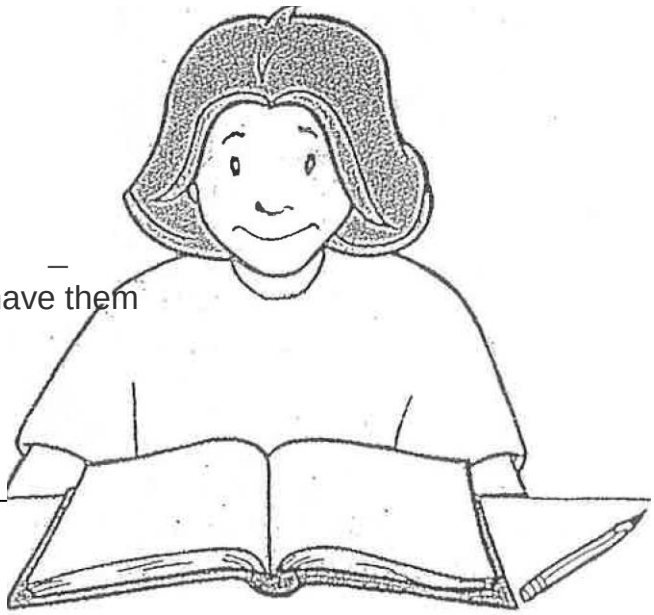
What do you want to know more about?

. Let's see...

I am interested in:

Space travel -Wild animals

Oceans - Plants

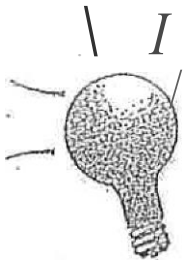


A Good Topic Is...

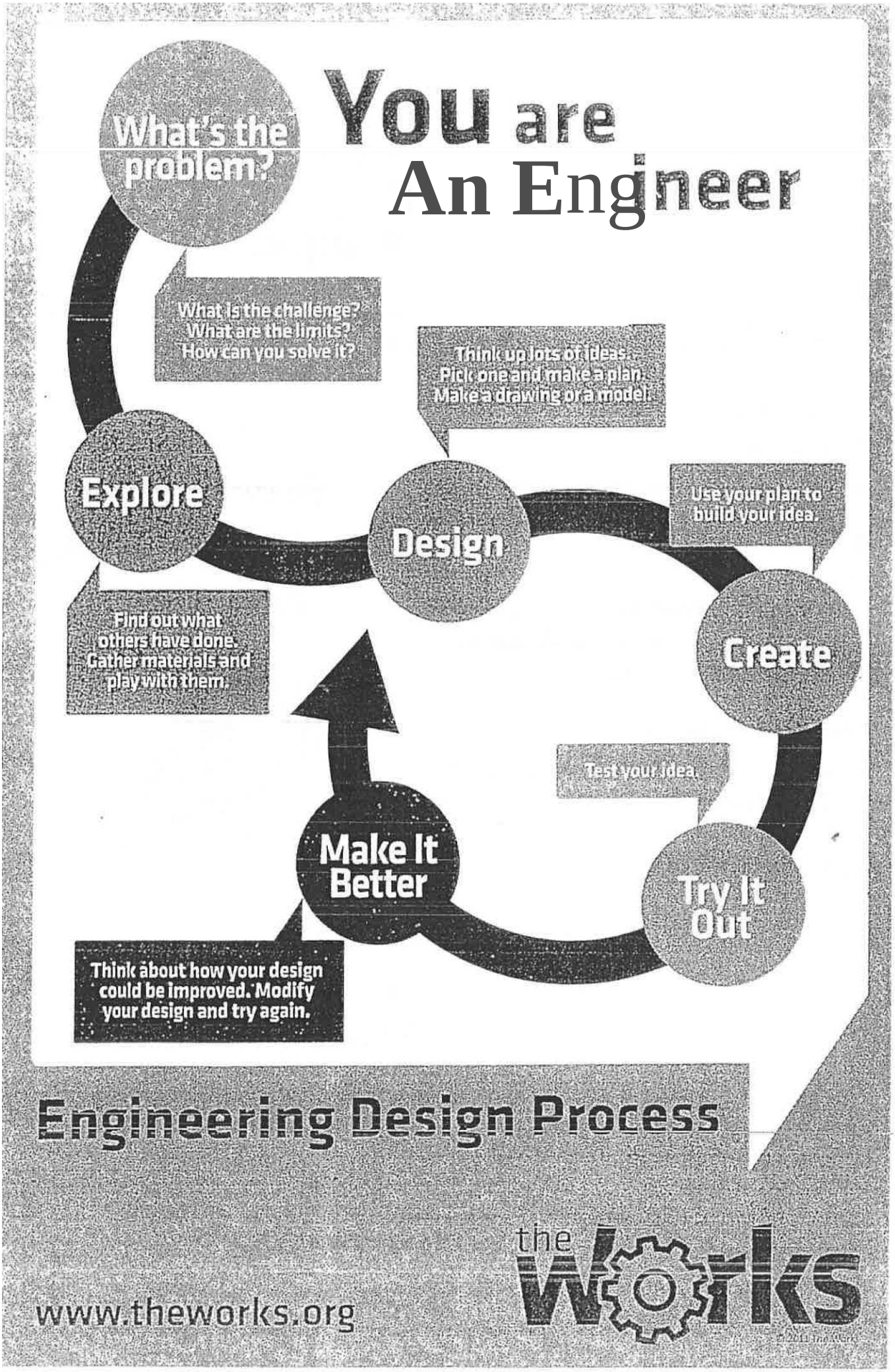
- realistic
- can be accomplished with available resources
- asks a scientific question that can be solved in a reasonable amount of lime

Take Some Time...

- Take several days to think about your topic·
- Look on line or through science books if you have them
- Talk to people at home
- Look around your house..



Write down your ideas for problems you might be able to solve by designing an engineering project.


You are An Engineer
What's the problem?
What is the challenge? What are the limits? How can you solve it?
Think up lots of ideas. Pick one and make a plan. Make a drawing or a model.
Explore
Design
Use your plan to build your idea.
Find out what others have done. Gather materials and play with them.
Create
Test your idea.
Make It Better
Try It Out
Think about how your design could be improved. Modify your design and try again.
Engineering Design Process
www.theworks.org
the Works

What Makes A Great Engineering Project?

An *outstanding* science project is the result of *creative* thought. It *is:*

Innovative--It contributes a new Idea, a new approach or a new solution *to* a problem.

Useful-It solves a problem or makes a contribution *to* society.

Understandable-Others can understand the procedure and repeat it with similar results.

Guidelines For A Successful Engineering Design

Either print the next several pages and write on them, write the same kind of information on your own lined paper, or type your information on your computer.

1. Take some time to think about a problem you'd really like to solve. The best projects are based on questions you might have about the world around you. There are lots of books and internet sites that can help you.

2. Choose something you can design using materials you already have at home so you don't have to send somebody to a store to find things.

3. You should write out each section of the project neatly on paper or on the computer

4. Use a table or chart to record your data.

5. Think about what you already know and what you need to know in order to be most able to design a solution to your problem. *Record your sources (where you find the information).*

6. Draw your design, then build it. When you have finished building your design, try it out, make improvements based on what happened, then try it out again.

7. Parents may help you, but remember this is your project, not theirs.

8. Remember to have fun!

How Can You Share Your Project?

Option 1: Make a **video** on your class's FlipGrid
Option 2: Make a **Google Slides** presentation
Option 3: Write a **report** that you upload to Google Classroom or email to your teacher.

Whichever option you choose, include each of the following:

a. Problem
b. Constraints
c. Background Knowledge
d. Research
e. Possible Solutions
f. Materials
g. Design andTesting Methods
h. Observations and Data
i. Design Evaluation
j. Design Improvement

Engineering Problem

What problem do I want to solve?

Constraints

What limits do I need to consider?

Background Knowledge

What do I already know, and why am I interested in solving this problem?

Research

What did I need to learn before getting started?
Where did I find this information?

Possible Solutions

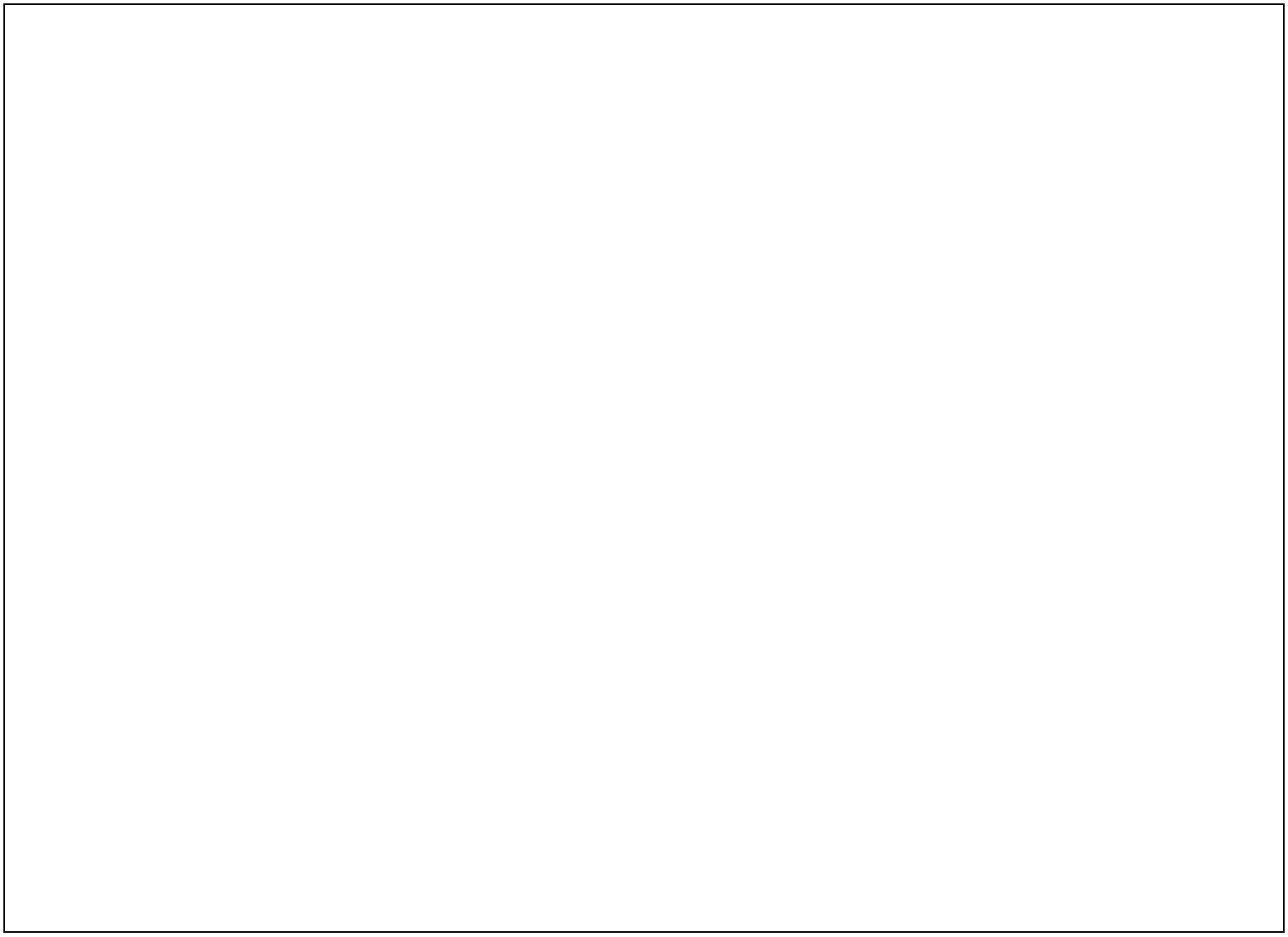
What ideas am I considering for solving this problem?

Materials

Everything I will need to use in order to build my project

Design and Testing Methods

A drawing of what I plan to build and a description of how I will test it.



Observations and Data

This is a record of what I observed and measured.
It could include a science journal, tables, diagrams and/or photos.
Everything you record is considered data.
You might want to turn your data into a graph.

Design Evaluation

Now, in words, explain WHAT HAPPENED during your solution test. Be specific. What part of your design worked? What part of your design did not work?

Design Improvement

What did you or would you change about the design in order to make it better?

Helpful Websites

Remember – you are asking a question and doing an experiment to find the answer. This is not a demonstration project.

1. Science Fair Central - Engineering Projects for Kids – This is excellent.
2. National Geographic Kids - Science
3. Lawrence Hall of Science - DO SCIENCE!
4. IPL Science Fair Resource Guide
5. Exploratorium "Science Snacks"
6. Science Fair Central (Main page which also includes science investigations)
7. Education.com Science Fair Ideas
8. Science Buddies: This site offers a survey where you type in your interests, and it gives you some suggested project ideas
9. U.S. Geological Survey