

ENGINEERING

Teachers, please copy both sides of this page for your students to take home.

Dear Students and Parents,

We hope you enjoyed your recent day of science exploration and investigation with Pacific Science Center's *Engineering* van. The Science On Wheels program, which began operating in 1974, is an interactive outreach program that travels to schools across the state of Washington.

The *Engineering* van provides students with hands-on science experiences. Students participate in a lively assembly, explore an interactive exhibit area and receive a 45-minute hands-on lesson. Our goal is to foster an interest in science, technology and mathematics.

We encourage you to talk about our visit and investigate the activities below. They require few materials and are easy to do. Remember: your child and his or her friends will be the ones to invent new solutions for the future! We hope you enjoy doing these activities together!

~Science On Wheels Teachers

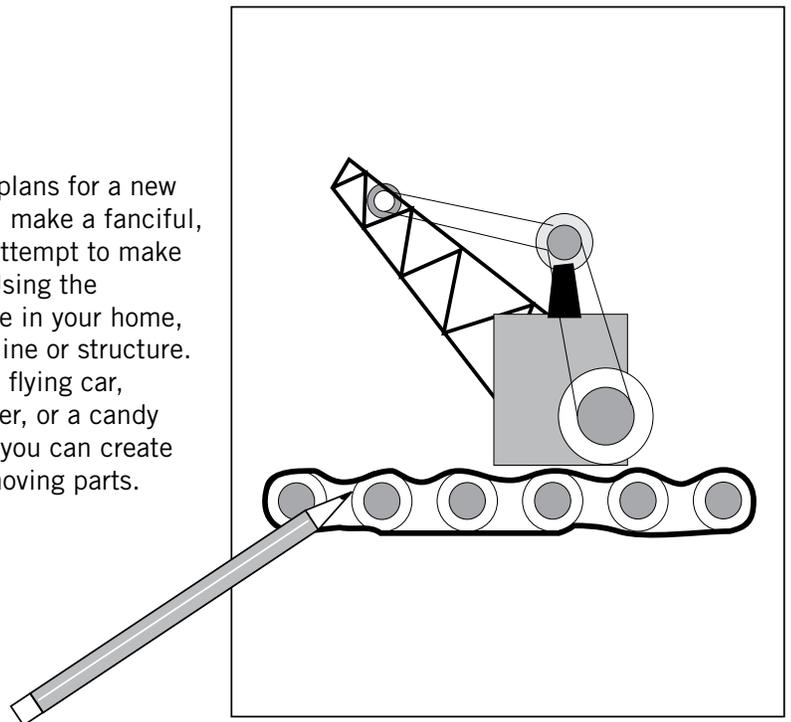
Machine Building Station

Materials

- storage containers and other household items (paper towel rolls, plastic cups, spoons, string, pipe cleaners, boxes, etc.)
- scissors
- glue
- tape
- graph paper
- white paper
- colored pencils or crayons

Design

Design and draw plans for a new machine. You can make a fanciful, silly machine or attempt to make a real machine. Using the materials available in your home, build a new machine or structure. You could make a flying car, room-cleaner-upper, or a candy dispenser! See if you can create something with moving parts.



Build a Paper Bridge

Materials

- 2 pieces of paper
- several books (one fairly heavy)

Design

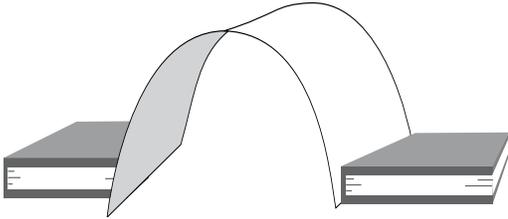
- Place a sheet of paper between two books to look like a bridge.

Test

- Place a book or other load on the sheet of paper and see what happens.

Re-Design

- How can you make the paper stronger? Try two sheets of paper. Try folding the paper accordion style. What else can you try? What size of load can your paper bridge hold?



What's going on?

Look at the bridges in your own town and in books. Notice what supports them and what they are made of. Sketch a few and compare the shapes each bridge is made of. Engineers use math to figure out the most efficient way to support bridges and buildings. They consider the strength and weight of the material, the shape of the structure and where the weight will be carried. Many engineers use computers to help them with their calculations.

Your Own Hideout

Design

Build your own hideout. Make it out of items from around your home! Be creative. How many rooms can you put in your hideout? Do you light your hideout with windows or flashlights? What is the best shape in case of an earthquake? What kind of hideout would be cool in the summer? What can you do to your hideout to make it warm in the winter?

Test

Make an earthquake by giving your hideout a shake. Make sure no one is inside when you do this. What is the shape of the parts that stay standing?

Does your hideout have enough room to have a party with your friends or enough light to read a book?

Re-Design

Keep making new designs. See how big you can make your hideout. See how many rooms you can make your hideout have.

Materials

- pillows
- boxes
- sheets
- clothesline
- sticks
- chairs
- choose your own!



Resources

Find these books at your local library or book store:

Building a House, by Byron Barton, 1990

1 Pulleys and Gears (Simple Machines), by David Glover, 1997

2 The Usborne Illustrated Handbook of Invention & Discovery, Usborne Pub. Co., 1986

Underground, by David Macaulay, 1983

Credits

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