Forces in Playdough

Summary

Students use playdough to understand what force is and to show different kinds of forces.

Current Physical Science Curriculum links

Force + Motion (gr 1), Forces (gr 5)

Draft Physics Curriculum links

Motion of Objects (K), Forces + Motion (gr 2), Energy (gr 4), Newton's Laws of Motion (gr 6)

Processes of Science/Curricular Competencies

Observation, manipulation, questioning, recording, inferring, concluding

Materials

- playdough, 1.5-2kg for a class (purchased, or see recipe below)

Materials Cost

$10+ for playdough for a class of students, or make your own for a couple of dollars (see recipe below)

Procedure

Introduce students to the concept of force, if it hasn't been done already: a force is a push or a pull that makes an object move, stop, change speed or change direction.

Hand out a ball of playdough each (about the size of a golf ball). Show students how to make it into a sausage.

Ask students to bend/twist/manipulate their sausage into a new shape, or simply move it along the desk. They should think of exactly where their fingers apply force to make the new shape/move the play dough to a new position. Ask students to draw the new shape/position, and add arrows to their drawing where forces were applied.

Optional: introduce names for the different kinds of forces on the playdough (push/pull/twist/bend/stretch/tear).

Gather group to show shapes and describe the forces used to make them. Reinforce that force is a push or a pull, and that it uses energy.

Playdough recipe

Materials: 2 cups flour, 2 tablespoons vegetable oil, 2 tablespoons cream of tartar, 1 cup salt, 2 cups water, food dye. Doubling this recipe makes enough for a class of 24 students, about 1/3 cup each (a ball a little larger than a golf ball).

Procedure: Mix ingredients together in a pot over medium heat. Stir constantly as the mixture heats up. Once it starts to make a thicker paste, remove from the heat and keep stirring until it is all playdough consistency - it will get quite hard to stir. Dump onto a board and knead until the texture is even.

Store sealed in a ziplock bag. If some of the playdough dries out, just knead it into the mass again.

More details, references and further experiments

- This activity at www.ingridscience.ca/node/100
- Follow up with other force activities using playdough: Balancing Toy at www.ingridscience.ca/node/200 and Lever Experimentation at www.ingridscience.ca/node/375

ProD Day Oct 24th 2014
Hands-on Science
with Ingrid Sulston