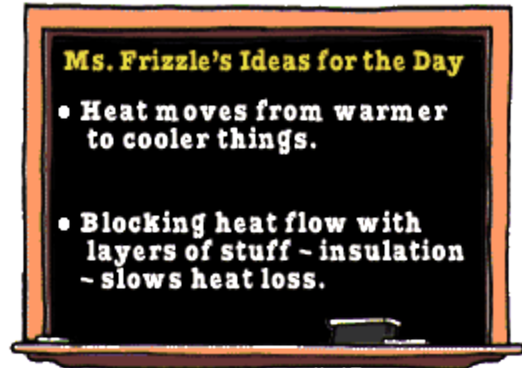


The Magic School Bus

Field Trip Notes

Ms. Frizzle's students are putting on a play about global warming, and they need some cold, hard facts. The Friz and her reptilian sidekick, Liz, know just where to find them! This is no ordinary field trip, as a hop on the Magic School Bus takes the class and the audience on a whirlwind tour. From the arctic to the equator, they see telltale signs of climate change and learn how conservation, recycling and alternative energy can make a difference. Ms Frizzle and her class are up for the climate challenge. Are you?



Curriculum Connections: Science, Weather, Environmental Issues, Observation, Cooperation and Teamwork, Communication

The Inspiration of Insulation

Going Hands-On

Time: 30 minutes

Group Size: 2-4

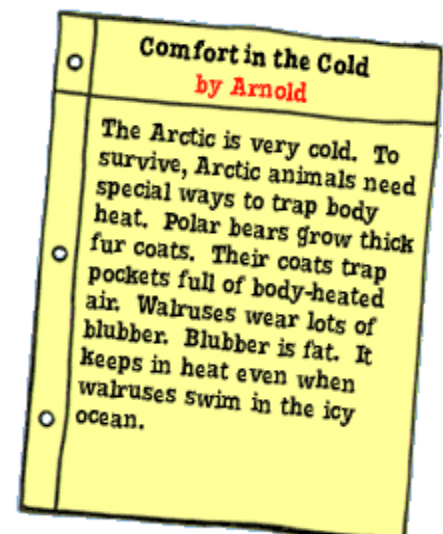
The Magic School Bus kids are freezing! When they discover that heat flows from hotter to colder things, they find ways to block heat escape routes. Your kids explore how insulation works to keep in body heat.

What You Need

- Spatula or spoon
- Large bowl of ice water
- Copies of THE INSPIRATION OF INSULATION page

For each group:

- 4 sandwich-size zipper plastic bags



- 12-15 cotton balls
- water and ice
- 1 cup solid shortening

Ahead of time:

For each group, tightly seal some ice and water in one zipper bag. Put the shortening in a second bag.

Talk About It

Ask: How do layers of clothes, fur coats, and fat keep humans and animals warm when it's cold outside? (Fat and trapped air in fur or clothing layers block the flow of body heat into the cold.)

What To Do

In two demonstrations, kids explore how air and fat can slow the flow of body heat into ice water.

1. In the "Polar Bear Blanket" test, cotton fibers trap body-heated air, much like polar bear fur. Pass out materials. Help kids follow activity-page directions.
2. Ask: How do polar bears keep warm in the Arctic? (Air spaces in their fur trap body-heated air.) How are the cotton balls like polar bear fur?
3. The "Walrus Mitt" seals a hand inside a layer of fat to imitate walrus blubber. Pass out materials. Help kids follow activity-page directions. Show how to zip the shortening and empty bags together to make the mitt.
4. Ask: How do walruses keep warm in icy cold water? (Blubber slows the movement of body heat.)

Next Stop

Challenge kids to insulate jars of warm water so that they keep the heat as long as possible. Dip a finger in each of the jars after an hour. Which stayed the warmest? Why?