Gummy Bears Cut Through Metal

Objective: Students will observe and create and identify endothermic and exothermic reactions and observe how properties change with each reaction.

Procedure

1. Set up: Set up stations in the classroom with different materials such as: a frying pan on a burner with an egg for each group (with an adult supervisor), ice cubes, hand warmers, instant ice packs, water and calcium chloride, and water and ammonium nitrate students will mix with supervision.

2. Ask: Have you ever used one of these instant ice packs after getting hurt at school? How might it work? What happens when the contents mix together? Why?

Materials:

- Hand warmers
- Instant packs
- Eggs
- Ice
- Heat source (if you are in a warm climate, you might go outside to pavement, otherwise, a pan on a burner works)
- Calcium Chloride (optional)
- Ammonium Nitrate (optional)

3. Explain: When the contents mix together, they trigger an endothermic reaction, meaning a reaction that absorbs heat from its surroundings. The cold pack likely contains water and ammonium nitrate separated by a barrier. When the pack is squeezed and the barrier breaks, the two mix and absorb heat from the surroundings, cooling the water.

4. Have students fold a page of their notebooks in half lengthwise,labeling one side “Endothermic” and the other side “Exothermic.”

5. Students should write the definitions under each term, and also write questions under each term “Does the reaction heat or cool the surrounding area?” Explain that if the mixture causes an increase in temperature, the reaction is exothermic, and if the reaction causes a decrease in temperature, the reaction is endothermic.

6. Have students work in pairs to circulate from station to station to test the reaction and decide if it falls into the column of endothermic or exothermic.

7. Explain that now that students understand the two types of thermodynamic reactions, they can watch a world famous magician use thermodynamics to make gummy bears pass through a metal sheet.

8. Tell students to write down observations as they watch, and to be prepared to explain what type of reaction occurred in the video.

9. Show students Impossible Science video.

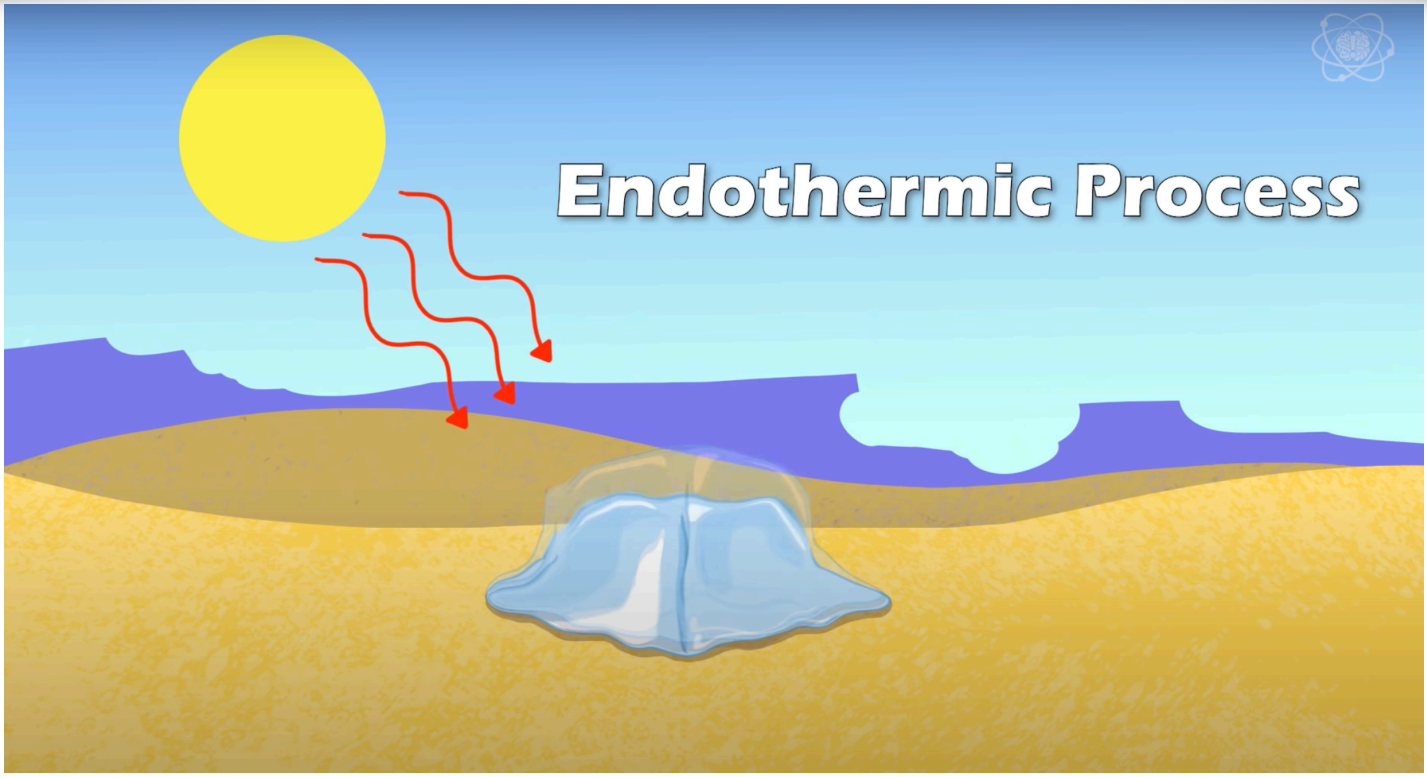
Vocabulary

Endothermic process: When something absorbs energy (usually heat) from its surroundings, such as when an icicle melts in the sun. Endo=absorb/in Thermic=heat

Exothermic process: When something gives off heat or light, such as when a match is lit. Exo=release/out Thermic=heat

Assessment

Students should write an explanation of how the video demonstrated both endo and exothermic reactions.



Challenge

Have students design their own endothermic or exothermic reaction.

Support

Some students may need to rewatch the video to understand how the reactions occurred, and they should be allowed access to laptops to review the video.

Safety Note:

DO NOT TRY THE EXPERIMENT FROM THE VIDEO AT HOME.

Watch the companion video here:

YouTube