Keep-A-Cube

Thank you for downloading the science and mathematics activity packet! Below you will find a list of contents with a brief description of each of the items. This activity packet contains all the information (including any handouts) you will need to run this activity in your own classroom or at a science festival.

Please note: some activities might require the need for a facilitator to be present to oversee the activity. Activities that require a facilitator will be clearly noted.

-Community Resources for Science

ACTIVITY PACKET CONTENTS

1. Organizer Instructions for the person running the activity
    - Print suggestion: 1 for the facilitator
    - Includes information for setup prior to the event (e.g., materials prep)
2. Background Information
    - Extra information for the organizer/facilitator to better understand and explain the science behind the activity
3. Participant Instructions (tabletop sign/printout)
    - Print suggestion: 1-2 to put in a plastic sign holder

Keep-A-Cube

ORGANIZER INSTRUCTIONS

Grade(s): K-6

Standard connections:

- **CCSS.Math.Practice.MP1:** Make sense of problems and persevere in solving them
- **CCSS.Math.Practice.MP5:** Use appropriate tools strategically
- **CCSS.Math.Practice.MP2:** Reason abstractly and quantitatively

Next Generation Science Standards: Science and Engineering Practices

- **Constructing Explanations and Designing Solutions** Use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem
- **Planning and Carrying Out Investigations** Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question
    - Make predictions based on prior experiences

Objective: Keep an ice cube from completely melting in 30 minutes

Activity overview and background: Student-directed activity that can be completed in pairs or small groups. Engineers design ways to solve problems. In this activity students will engineer a way to keep an ice cube from melting for 30 minutes.

Materials (per pair or team):

- 2 ice cubes
- small cardboard box
- wax paper
- masking tape
- newspaper
- aluminum foil
- rubber bands
- paper plate

Setup:

1. Give each pair all of the materials listed above in the Keep-A-Cube kit

Keep-A-Cube

BACKGROUND INFORMATION

1. Ask students what makes ice melt? Heat! Lead discussion to conclude that the air around the ice cube is warmer than the ice, so they need to keep the warm air away from the ice cube. Insulation is a material that slows heat energy from passing through it.

2. Use the materials to make a KEEP-A-CUBE box that will keep an ice cube from melting. Remind class to think about what makes ice melt as they design their box. Using one cube, they can wrap up the ice cube, cover the box, or do anything else they can think of.

3. Put the second ice cube on a plate. This is the control cube. Don't make any changes to this ice cube.

4. Wait 30 minutes. Compare the ice cube in the KEEP-A-CUBE box to the ice cube on the plate. Which ice cube is bigger? Why?

5. Have the kids brainstorm other designs. How could they change the container so the ice cube melts more slowly? If there's time, you might want to encourage the students to repeat the activity with other insulating materials such as foam packing peanuts or cotton balls, or a different size box. Choose one thing to change (the variable) and make a prediction (hypothesis). Then re-test

Instructions

Working with a partner or group, your job is to keep an ice cube from melting for 30 minutes.

1. Think about what makes ice melt as you design your box. Using one ice cube, you can wrap up the ice cube, cover the box, or do anything else you can think of.

2. Put the second ice cube on a plate. This is the control cube. Don't make any changes to this ice cube.

3. Wait 30 minutes. Compare the ice cube in the KEEP-A-CUBE box to the ice cube on the plate. Which ice cube is bigger? Why?

4. How could you change the container so the ice cube melts more slowly?

5. Choose one thing to change (the variable) and make a prediction (hypothesis). Then re-test your new setup!