

DON'T LOSE YOUR COOL - Student Assessment Task

You are on a fieldtrip with your grade 7 Science class to Cadomin Caves located just outside of Jasper National Park. As you approach the far corner of one of the caves, you notice a strange looking insect imbedded in the ice. When you call over the guide, she excitedly informs you that this is a rare and extinct insect of the Canadian Rockies. She goes on to explain that it is very important the insect remain frozen in the ice until it can be brought to an entomologist who will determine if it is, in fact, the extinct insect.

After searching for a container that would be suitable for transporting the frozen insect, you realize there are no manufactured devices available.

You are to design, construct and evaluate an insulated container made of readily available materials that will protect the frozen insect for one hour in the ice while being transported by bus to an entomologist.

Instructions:

Explanation

In small groups or individually, design a container using readily available materials that will keep the ice containing the insect frozen for at an hour. The following criteria for the container must be met:

- **Maximum** of five materials:
 - Outer covering is considered one of the materials
 - Wrapping more than one layer of the same material will be considered multiple materials
 - You have the option to purchase one material for this project, but the rest of the materials must be found in the homes of your group members
 - Tape, with a width not exceeding 2cm, or glue may be used to join edges; tape exceeding this width will be considered a layer

- **Maximum** outer dimensions of 15cm x 15cm x 15cm
- Interior compartment must be able to accommodate an ice cube with dimensions of 3cm x 3cm x 5cm
- Opens and closes in order to be able to insert and remove the ice

Planning and Preliminary Drawing

Prepare a drawing of the container that includes an explanation of your preliminary design and choice of materials used to make the insulated container. You need to include a top view, front (profile) view and cross-section. Your drawing must be initialed by the teacher before construction begins.

Construction Days

Construct a device to be tested. The following procedure will be used in testing your container:

- A measured mass of ice, containing the insect, will be placed into your container.
- The container will be closed and left for a period of one hour.
- At the end of that time, the container will be reopened to determine the degree to which the insect is still embedded in the ice. You will measure the mass of the remaining ice.
- Your containers will also be inspected to determine whether the design requirements have been followed.

Optional Test Day

Students will continue with construction and will have the option to do a preliminary ice test of their container today.

Construction Adjustment Day

Based on the success of the preliminary ice test, students will make construction adjustments to their materials and design.

Final Test Day

The following procedure will be used in testing your container:

- A measured mass of ice, containing the insect, will be placed into your container.
- The container will be closed and left for a period of one hour.
- At the end of that time, the container will be reopened to determine the degree to which the insect is still embedded in the ice. You will measure the mass of the remaining ice.
- Your containers will also be inspected to determine whether the design requirements have been followed.

Application Questions

Independently, complete questions 1-5 on the “Don’t Lose Your Cool” question sheet. Be

prepared to share your answers with other groups.
After sharing, answer question 6 independently.