

Adaptations



Put your detective caps on and solve these two design challenges modelling a structural and behavioural adaptation to extreme cold.

Per group:

Challenge One:

- dishwashing glove
 - latex glove
- vegetable shortening/lard
 - pillow fluff
 - spatula
- hot glue gun
- ice cold water
- thermometer
 - timer
- sticky tape
 - scissors
- measuring beaker

Challenge Two:

- coloured paper
- up to 8 soft drink cans
 - water
- thermometer
 - timer
- sticky tape
 - scissors
- measuring beaker



Challenge 1. Structural adaptations to cold

Design a glove that will allow your hand to withstand an ice bath the longest. You can only use the above listed materials!

Procedure

1. Prepare a bucket with ice cold water. This water will be a representation of the near-freezing waters that animals like penguins, whales, polar bears and seals swim in.
2. Place your hand inside the bucket and use the stopwatch to time how long it takes before you find it too cold. Record this time in the results table.
3. Design your glove and include a diagram of your design below.
4. Place your hand inside your glove and repeat Step 2. Record this time in the results table.
5. Repeat the method with each group member.

Results

	Time in ice bucket (minutes and seconds)
Hand without glove	
Hand with glove	

Discussion questions:

1. How did you come up with the design of your glove? How did your understanding of adaptations to the cold help your design process?
2. How much longer were you able to withstand the cold with your glove on?
3. Repeat the experiment with another group's glove design. Is it more effective than yours? Why or why not?
4. How could you improve on your design?
5. Based on your experiment, do you think blubber is an effective physical adaptation to keep animals warm in the tundra? Why?
6. How could you test to see whether blubber or fur are more effective in keeping animals warm?



Challenge 2. Behavioural adaptations to cold

Design an experiment that models how **huddling** can keep animals warm. In this experiment you can only use the materials listed above!

Before you begin...

Brainstorm ideas for your procedure here:

Write a brief report on your experiment below

Aim:

Variables

Independent	
Dependent	
Controlled	

Hypothesis:

Method: Include a drawing of your experimental set up

Results: Tabulate and graph your results.

Conclusion: