Take It Outside: Winter
Winter Warmer

Introduction

Explain to the children that in the story of the Bear Who Stole the Chinook, the bear was hibernating. Hibernation is a deep sleep that some animals use to save energy during winter. Ask: Did you know that Britain has three animals that hibernate? The bat, hedgehog and dormouse all need to find a sheltered, frost-free place, safe from predators, in which to hibernate. Tell the children that they are going to use science to help find the best place for hibernation in your outside area.

You will need:

- Natural material (for mini den-building)

- Thermometer

- Stopwatch

- Recording sheet

- Hot water (teacher/adult only)

- Clear plastic wrap

- Elastic band

- Variety of potential insulating materials (foil, paper, cotton wool, fabric, bubble wrap)
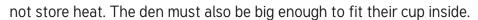
- Paper or plastic cups

Key Questions

- What is an insulator?

- Why is insulation important for hibernating animals?

- How could animals prepare for hibernation?

- Is the temperature increasing/decreasing?

- What would you expect to happen in 2 minutes/20 minutes?

What to do:

1. Begin by talking about hibernation. What is it? Why is it needed?

2. Explain that as well as needing a frost-free shelter, animals sometimes grow extra layers of fat or fur to keep them warm in their den.

3. Divide the class into groups. Head outside to your outdoor area. Ask: Can you find signs of animal activity? Each group should find a sheltered spot that could remain frost-free and work together to build a small den using natural materials. Make sure they consider the size – too small and it will not be comfortable, too big and it will

not store heat. The den must also be big enough to fit their cup inside.

4. You can continue outside or prepare the next part of the investigation in the classroom. You could have each group testing one material to find the best insulator. Ask each group to do the following:

   - Take a cup and wrap a material around it. Use three layers of the material.

   - Place an agreed amount (this must be the same for each group) of hot water in each cup (adult supervision required).

   - Take the temperature of the water at the start. Add it to your recording chart.

   - Cover the top of the cup with clear plastic film and secure with an elastic band.

   - Place the cup in your natural den.

5. As a control, place one cup outside with no insulating material.

6. Children should continue to record the temperature of the water at two-minute intervals.

7. What do they notice? Could they predict what would happen after ten minutes?

8. Ask them to look at their results after ten minutes. Which material was best at insulating? Why?

Ways to Support

For a simpler look at insulating materials, why not try this **Hibernating Bears Science Experiment.**

Ways to Extend

Try this **Trapping Heat Experiment** that uses different cup materials or perhaps you could investigate ways to keep yourself warm!

Curriculum Links

Science: Observing changing state; compare properties of materials; setting up practical enquiries, comparative and fair tests; gathering and recording data.

Take It Outside: Winter
STEM Activity – Winter Warmer

Insulating material	Starting temperature	Temperature of the water (˚C) after...						
		2 minutes	4 minutes	6 minutes	8 minutes	10 minutes	12 minutes	14 minutes
No insulating material								
Foil								
Paper								
Cotton wool								
Fabric								
Bubble wrap								
Other...								