6-8 years

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Science Content:
Life science, Zoology, Human Biology

Target Concepts/Skills:
Adaptation, Physiology, Insulation

Target Age group:
6-8 years

Duration of activity:
3-4 lessons, each separate step/inquiry can take 40 minutes to an hour to complete

Summary:
The children are presented with a situation of a melting snowman and asked whether they think putting on a coat will make it melt faster or slower. The investigation involves testing different materials and how fast ice melts when these materials are wrapped round it. From this, the insulating power of fur on animals is considered in view of animals' adaptation to their environmental surroundings.

Objective:
By the end of the activity children should be able to:

- Design a fair test to study how different materials insulate
- Collect data to compare the insulation capability of different materials;
- Draw conclusions about the insulation capability of fur/wool

Resources:

- woolen gloves or woolen scarf
- Ice cubes
- beakers or glasses, warm water, thermometers
- insulation materials like fur, bubble wrap, feathers, fat...

Body covering and insulation power

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This project Pri-Sci-Net has received funding from the European Union Seventh Framework Programme (FP7 2007 /13) under grant agreement No.266647

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1. Engage (Forming hypotheses)

Stimulus: Concept Cartoon with snowman, How can we stop him from melting?

The children are asked to formulate hypotheses and to justify their ideas (using their previous knowledge and training their argumentation skills), e.g. "I think the coat makes snow melt faster / slower, because...".

2. Inquiry (Designing and running experiments and observations)

Inquiry 1: Will a coat make a snowman melt slower of faster?

Plan and conduct investigation to test hypotheses put forward by the children.
A first experiment could be guided by the teacher:
e.g. Melt test: If wool warms, an ice cube should melt faster if it is covered with wool (A) or if wool insulates, an ice cube should melt slower if it is covered with wool (B)
=> place ice cube in a wooden glove/scarf (control: ice cube without glove/scarf) and observe melting time
Children are asked to document their observations (e.g. with drawings or using digital camera and taking pictures of the two ice cubes at given times). They can also time the difference for an ice cube to melt completely when exposed directly to heat/sun or when it is wrapped in a scarf. At this stage, the children use simple equipment and non-standard units to record changes.

Children use the obtained data to answer the research question.

Inquiry 2: Which material best keeps a block of ice from melting?

More experiments can be planned by the children themselves using different insulation items.

Progression of skill development in IBSE: An alternative method includes the measurement of change in temperature of warm water in beakers with thermometers (instead of ice cubes) wrapped with different insulating material (see picture in attachment) This way, the children collect data using equipment (thermometer) and standard measures.

Children should fill in a protocol/ worksheet with their observations (also using tables, see example in attachment).

3. Evaluation (Evaluating evidence)

This activity can be organized in different ways: either all groups trying out the same materials or else different groups trying out different materials, and then comparing results.

- comparison of different groups' methods and results
- plenary discussion of findings, always referring back to the research question. Emphasise the use of evidence in drawing conclusions.

Extended activities:
- Compare different animal body coverings (vertebrates: feathers, fur, fat),
- Match body coverings (fur/fat, feathers, scales) and animal photographs (sorting animal groups),
- Discuss how the body coverings are adaptive to the organisms/ habitats (reptiles and amphibians cannot hold their body temperature => need specific habitats)

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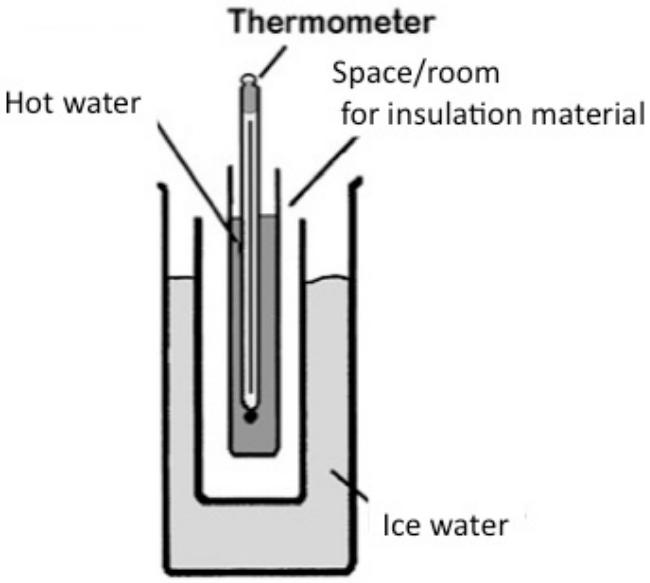
Concept cartoons: http://www.millgatehouse.co.uk/special-offers/the-snowmans-coat-big-book



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1. We want to find out... (research question):

2. We think that... (hypothesis):

because... (justification):

3. Materials that we need for the investigation:

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4. What we did (method):

5. Our observations:

Material	Time 1	Time 2	Time 3
Wool			
tinfoil			

6. Our observations show that... (conclusion):

Therefore our hypothesis could be confirmed ☐ / not confirmed ☐

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