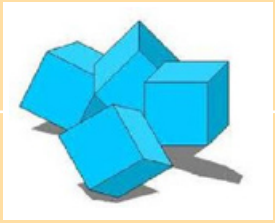
WHAT MATERIAL WILL KEEP ICE LOLLIES THE COOLEST?

JUNIOR

Equipment:	Ice cubes, variety of materials (*e.g. newspaper, kitchen foil, bubble wrap*), plastic tray.
Suggested Class Level:	Younger classes
Preparation:	Have ice cubes ready to use. (*To make this more fun and realistic for small children: Make ice cubes/lollipops with the children beforehand, and mix with fruit juice for fun colours and taste. Link this with 'Senses'*)
Background information:	Some discussion should have taken place previously on heating and cooling. The effect of heating and cooling water, heating ice, chocolate etc. Heat passes from the warmer thing to the cooler thing, if there is a way for it to pass. Things like metals pass heat easily and therefore are not good insulators. Anything with lots of air pockets does not let heat through easily, so wool, bubble wrap, cotton wool etc. are good insulators. They neither let heat out or in, so they keep the warmer thing warm and the cooler thing cool! Flasks keep things really hot, or really cool, because a flask has two layers with a vacuum (*nothing, not even air*) in- between. So there is nothing to let the heat in or out. (*See DPS activity 'Keeping Warm' for more on this topic*)
Trigger questions:	Try to have visual cues to help children focus on how to keep warm or cool, e.g. posters of winter clothing and summer clothing. What happens to ice lollies on a hot summer day? Why do you have to eat them fairly quickly? If you want to bring some home to your family do you think it would be a good idea to wrap them up? If so, what sort of stuff do you think would be best to wrap them up in? Do you think the children in this picture should put the coat on the snowman if they want to keep him for longer?



Taken from Keogh and Naylor, "Starting Points for Science", Millgate House

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Content:	**SCIENCE:** Materials: properties and characteristics Energy: Heat
	MATHS: Measures: Time Number: Comparing and ordering Data: Representing Shape and Space: Spatial awareness
Skills:	Predicting, investigating, experimenting, analysing, recording
Cross-curricular Links:	
Activity:	As this is a slow activity, teacher may need to have another topic/activity going on while the ice is melting. Show the children the various materials which you have brought in and ask them: "Which of these materials do you think would be the best for keeping ice lollies cool?" "Next best", etc. "How do you think we could carry out a fair test to try to answer this question?" A suggested approach could be: Different groups of children wrap ice cubes in different materials and wait to see how long it takes for each cube to melt. They could compare these with an unwrapped ice cube. For fair testing, what do they keep the same? (*Size of ice cube, number of layers of material, surface the ice is on*). What do they change? (*The material*). What do they measure? (*The time*). The children note the order in which the ice cubes melted. 
	MATHS: Count the materials and ice cubes Time: Look at the clock, see where the big hand is at when the ice had melted. Order and compare which materials were the best and the worst Spatial awareness and positional language when putting the ice in different places, e.g. the ice is BESIDE the heater, UP on the shelf, on the LEFT of the door, etc.
Safety:	

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CLASSROOM ACTIVITY PACK

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Follow-up activities:

1. "Where will the ice cube melt the fastest?"
This time put ice cubes on identical plates (*these can be plastic or paper*), leave them uncovered and place them in different parts of the classroom, e.g. on the window ledge, beside the radiator, in a cupboard.

OR They could compare placing the ice cubes above and below the radiator, and ask them "What does that tell us about hot air? (*It rises*)

Investigating:
Keep the same: cube, plate
Change: temperature.
Measure the time for each cube to melt.
Discuss why they think they got these results.

2. "Does putting the ice cubes on different surfaces make any difference to the time it takes for them to melt?"
The uncovered ice cubes can be put on different things, e.g. wood, metal (*perhaps a tin lid*), newspaper, kitchen foil etc. in the same place (*i.e. at the same temperature*) Again the time can be measured.

"Did it make any difference what the ice was put on?"

Note on the Snowman!
Coats keep you warm by keeping the heat of you body in (*remember heat travels from hotter to cooler*). So the coat will keep the snowman cold by not letting the warmer air in!

The top of a plastic mineral bottle, filled with water and frozen, would make a good model snowman.