***The Penguin Project*** Planning ahead and equipment list

## Investigation 1: The penguin huddle

Equipment needed per group:

* [student booklet](http://assist.asta.edu.au/sites/assist.asta.edu.au/files/Student%20booklet_Yr3_The%20Penguin%20Project.docx)
* 7 empty metal cans (of the same size and made of the same material) such as common soup cans or aluminium drink cans
* warm water (able to place hand in safely between 40–50 o C)
* 7 thermometers
* stopwatch
* marking pen

Students should preferably work in groups of three.

## Investigation 2: What should a penguin ‘wear’ to keep warm?

Equipment needed per group

* [student booklet](http://assist.asta.edu.au/sites/assist.asta.edu.au/files/Student%20booklet_Yr3_The%20Penguin%20Project.docx)
* empty metal cans (of the same size and made of the same material)
* materials to cover the exterior of the cans e.g. polystyrene foam pieces broken up from a cup, foam rubber, aluminium foil, cotton wool, wool, plastic wrap, mouse-pad, stubby holder, woollen scarf etc.
* warm water (able to place hand in safely between 40–50 o C)
* thermometer
* stopwatch
* scissors
* masking or sticky tape
* marking pen

It is not necessary to have 7 cans per group in this activity (the 7 cans were used in the first activity in order to have 1 can in the centre surrounded by 6 others). Groups of students could have 1 can each which they cover, test, remove the covering and repeat with a different covering, or they can prepare as many cans as is possible at one time given the limitations of the equipment.

Collect a variety of materials for covering the cans. A range of materials is best for a comprehensive test. To ensure fair tests of the insulating materials, all the cans should contain the same amount of water at the same temperature, and the timing needs to be the same for all cans.