How Does it Work?: Thermometer — Trend task

Approach: One to one *Level:* Year 4 and year 8

Focus: Explain the operation of measuring instrument and predict the effects of alterations of its components.

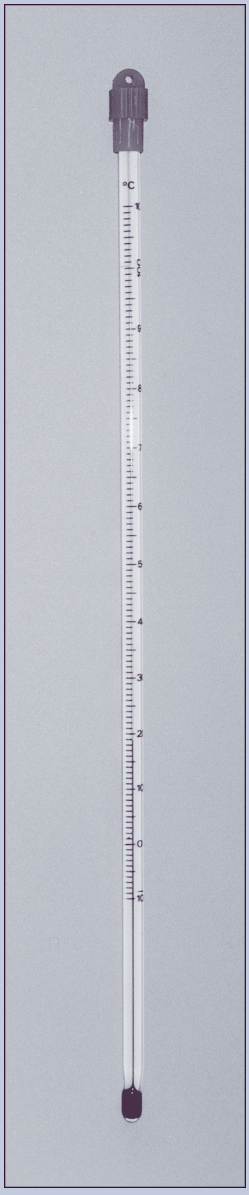
Resources: Scientific instrument: thermometer.

Questions/instructions:

In this activity I want you to try to explain how a bit of equipment works.

Give the student the thermometer.

Now have a look at this.



	% responses 1999 ('95) year 4	1999 ('95) year 8
1. What do people use this piece of equipment for?		
to measure temperature	65 (75)	90 (96)
If the student doesn't know, tell them it is used to find out what the temperature is.		
2. What is this piece of equipment called? thermometer	44 (47)	83 (26)
If the student doesn't know tell them it is a thermometer.		
3. Can you explain how the thermometer works?		
Rising temperature causes liquid to expand, pushing it along the tubing.		
clear and correct	3 (10)	16 (25)
limited understanding	66 (40)	71 (45)
4. What would happen:		
• if you put the thermometer in some boiling water?		
measures 100°C (at sea level)	8 (8)	29 (29)
goes to top	57 (66)	43 (55)
• if you put the thermometer in something that is 130°C?		
breaks	20 (20)	40 (46)
goes to top	33 (43)	38 (39)
Point to the appropriate part of the thermometer for the student:		
5. What would happen:		
• if the hole in the long part of the thermometer was fatter?		
move less as temperature changed	3 (11)	10 (16)
read lower	15 (9)	28 (18)
be inaccurate	5 (14)	14 (12)
• if the bulb was made of thicker glass?		
take longer to register temperature change	7 (20)	29 (46)

Commentary:

Year 8 students performed substantially better than year 4 students. Changes in performance between 1995 and 1999 were mixed, with some improvements and some declines in performance. Overall, there was a small decline in performance.