

ANALYSING EXPERIMENTAL DATA

ACTIVITY 1 ♦

A group of students did an experiment to study an aspect of heat transfer. Figure 13.1 shows how the equipment was set up and Table 13.1 gives the results. Look briefly at the results, then answer the questions.

QUESTIONS

- 1 What do you think was being studied? *(3 types of rods are used)*
- 2 Suggest a heading for the experiment.
- 3 What factors would need to be controlled in this experiment for it to be a fair test?
- 4 What were the variables being measured?
- 5 Graph the results on the same set of axes.
- 6 Use your graphs to write a conclusion for the experiment.
- 7 On the basis of these results which rods were conductors of heat and which were insulators — or can you tell?

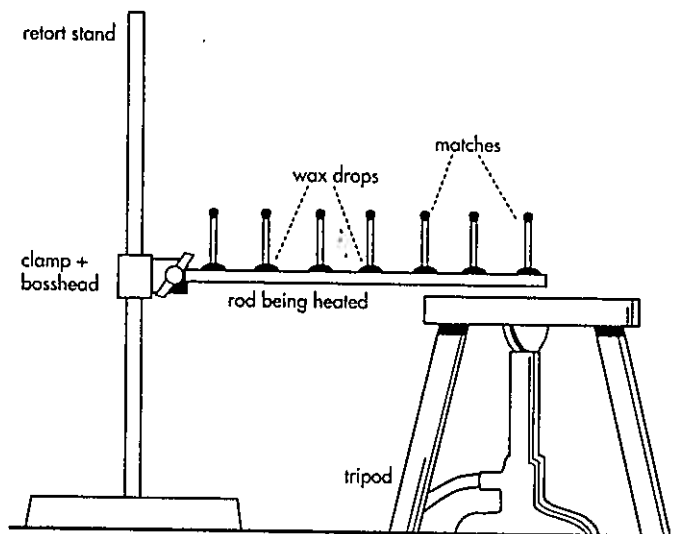


FIGURE 13.1

TABLE 13.1

MATCH	TIME FOR MATCH TO FALL (MIN)		
	ROD X	ROD Y	ROD Z
1	0.5	0.5	0.5
2	1.0	0.75	0.75
3	2.0	1.2	1.25
4	3.5	1.8	2.0
5	5.5	2.75	3.75
6	8.0	4.0	5.5
7	12.5	5.75	9.0
8	15.0	7.5	13.0
9	21.0	12.75	19.0

2 Different metals expand by different amounts when heated. A bimetallic strip consists of two layers of different metals fused tightly together. When heated, one metal expands more than the other and so the bimetallic strip bends (Figure 10.43).

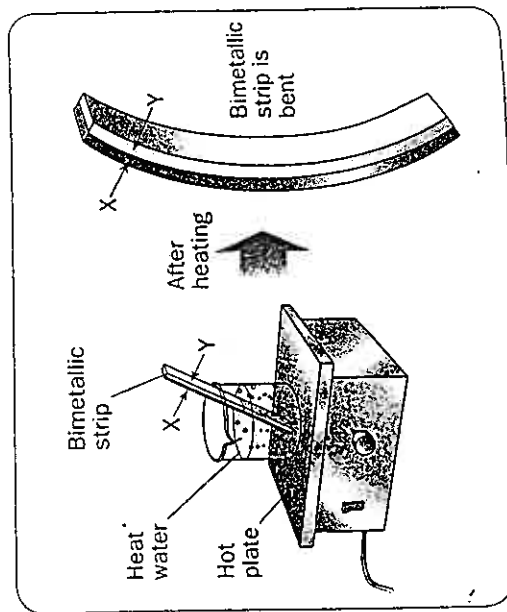


Figure 10.43 Which metal on this bimetallic strip expands more on heating?

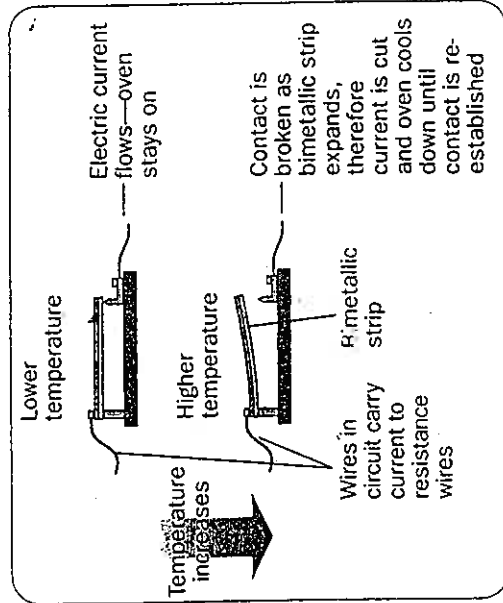


Figure 10.44 An electric thermostat control using a bimetallic strip

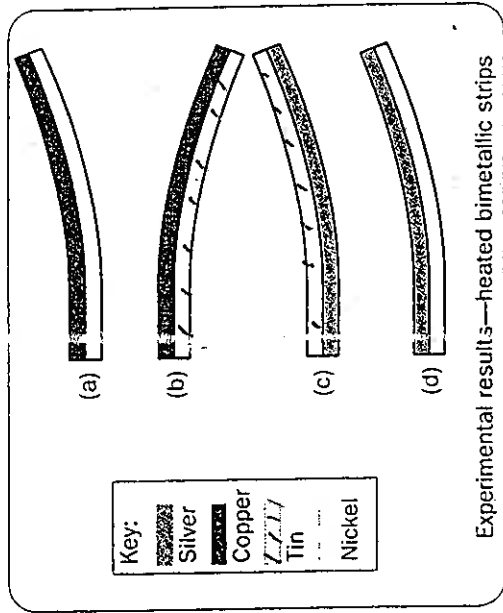


Figure 10.45 Bimetallic strip experiment

- Which metal (X or Y) expands more on heating?
- Bimetallic strips are used in such devices as thermostat temperature controls (Figure 10.44). Explain how the thermostat works.
- Figure 10.45 shows various bimetallic strips made from copper, tin, nickel and silver. The bimetallic strips are heated in beakers of hot water. The direction in which they bend is shown. Use this data to rank these four metals in order from greatest expansion to least expansion.