8Lc/4 Travelling sound 2

Sound travels through different materials at different speeds. This is because materials vary in density. Sound travels very quickly through dense materials because the vibrations are passed along quickly as the particles are in close contact. Sound does not travel through air very well because gases have particles which are far apart and they need to touch to pass on the vibrations.

Material	Speed of sound in m/s
steel	6000
aluminium	5100
iron	5000
concrete	5000
glass	4500
copper	3700
brick	3000
salt water	1560
water	1500
mercury	1450
ethanol	1200
air	330
oxygen	316
carbon dioxide	260

8 L c

1 Plot a bar chart to show the speed of sound in these materials.

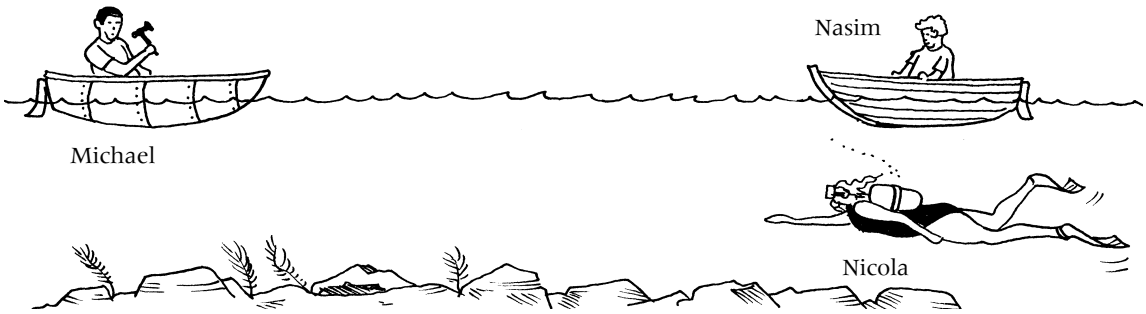
2 **a** Which two materials are the most dense?

b Which two materials are the least dense?

c Which material allows sound to travel 4 times faster than in water?

d Sound travels though cork half as fast again as it does through air. What is the speed of sound through cork?

3 Michael is sitting in a boat with a metal hull. He is hammering the bottom of the boat.



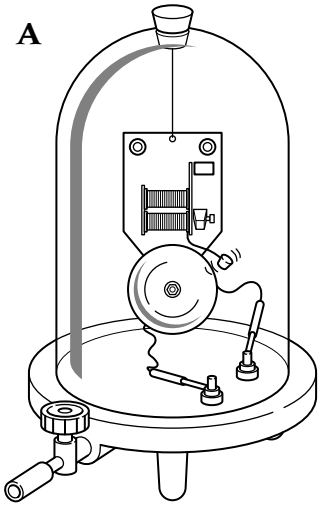
a Who will hear the sound first, Nasim or Nicola?

b Explain your answer to part **a**.

Travelling sound 2 (continued)

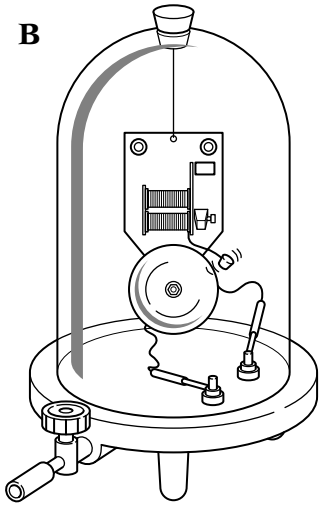
4 For each jar say whether you can hear the bell ringing and explain your answer.

A



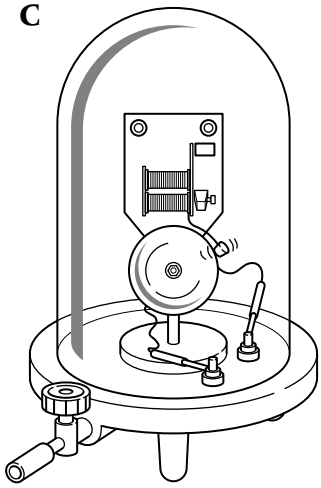
contains air

B



contains no air

C



contains no air

5 You can send a message to someone in the next room by tapping on a radiator. In which system will the message will travel fastest – one made of copper, iron or steel?

6 Copy and complete these sentences.

Sound is caused by _____. Sound cannot travel through a _____. The speed of sound in a solid is _____ than it is in air. This is because a solid is more _____ than air.

knowledge, numeracy