SMILE WORKCARDS

Measurement Pack Two

Contents
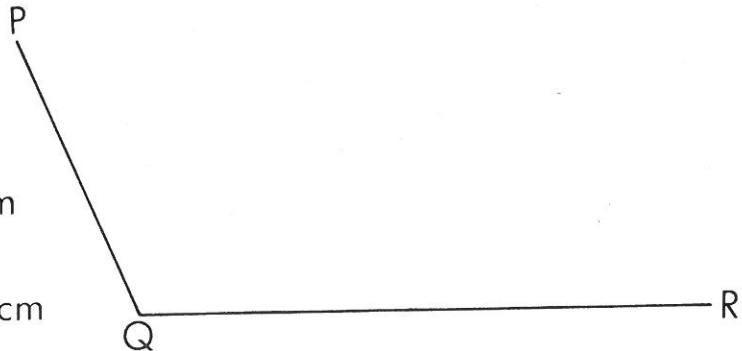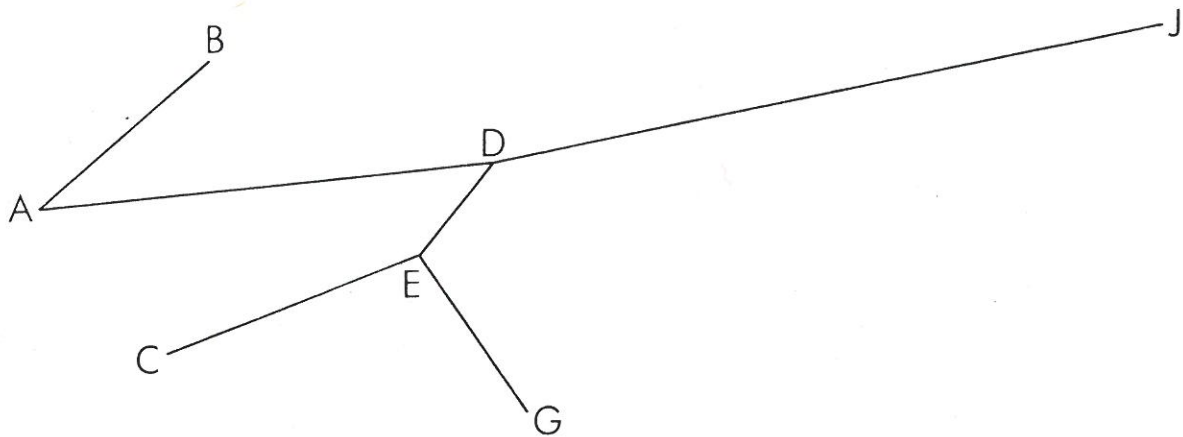
Accurate Measuring
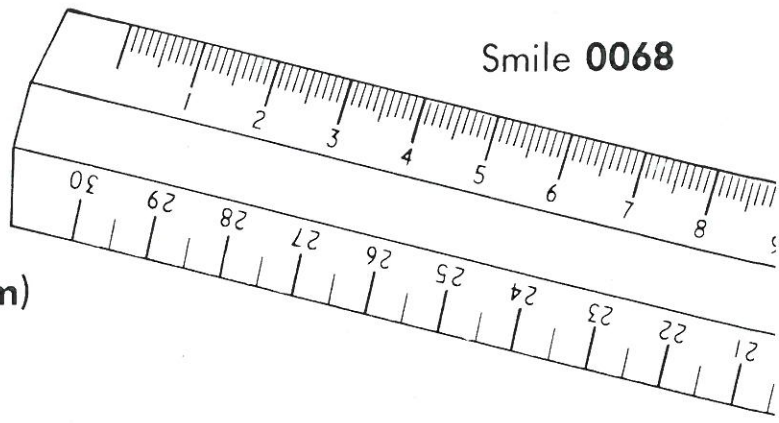
For these measurements you will
need a ruler with each centimetre (cm)
marked into 10 millimetres (mm).

(a) Measure the line PQ.
  PQ = 40mm   PQ = 4 cm

(b) Measure the line QR.
  QR = 75mm   QR = 7.5cm

Measure these lines.
For each line write its length in cm and mm.

1) DE = 1.5 ☐
2) DE = 15 ☐

3) AB = 3.0 ☐
4) AB = 30 ☐

5) AD = ☐ cm
6) AD = ☐ mm

7) CE = ☐ cm
8) CE = ☐ mm

9) GE = ☐ cm
10) GE = ☐ mm

11) JD = ☐ cm
12) JD = ☐ mm

For each of these measurements write two answers, one using cm and the
other using mm.
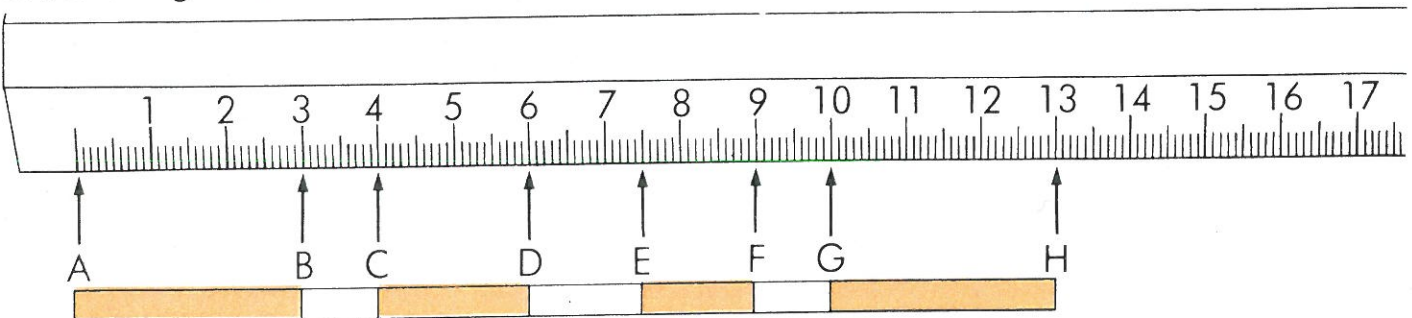
13) CA
14) DH

15) CF
16) EB

17) BG
18) EH

19) GF
20) GC

Measuring pencils

Here are eight friends' pencils.

Joyce
5.5cm
55mm

David

Colin

Sally

Jason

Jody

Anila

Karen
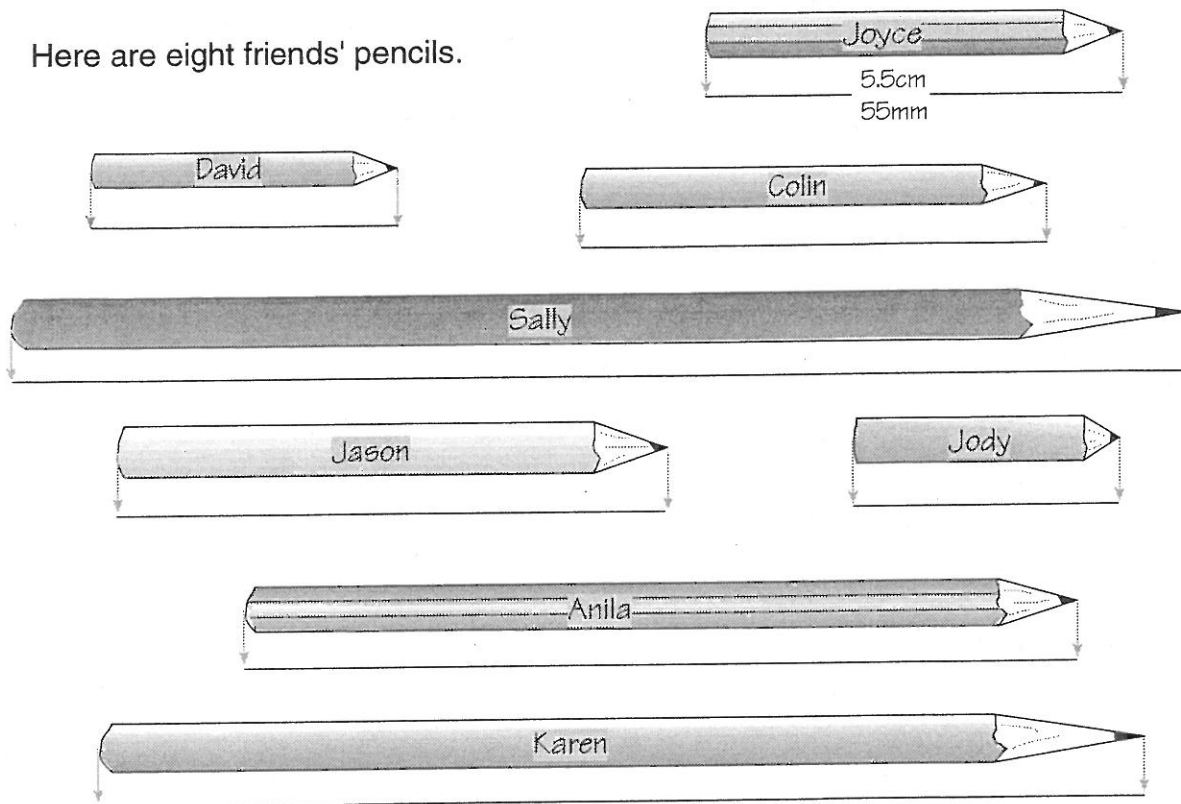
1. Measure each of the pencils and record their lengths in centimetres and millimetres in a table.

Smile 2270   Measuring Pencils   May 7th

	cm	mm
Joyce	5.5cm	55mm
David		
Colin		
Sally		
Jason		

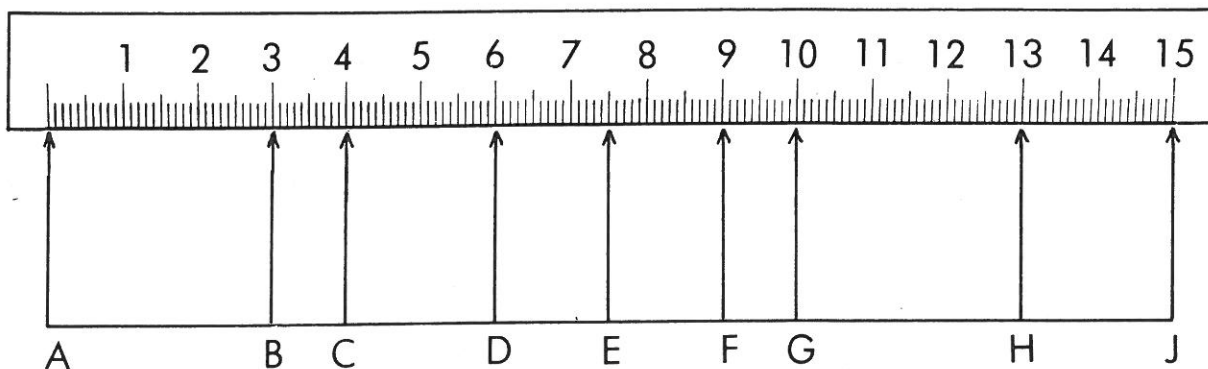**2.** What is the connection between the measurement in centimetres and millimetres?

Eight other friends measured their pencils. They didn't finish the table.

3. Copy and complete the table.

	cm	mm
Jerome	9cm	
Danny	7.5cm	
Rosy		110mm
Beth		125mm
Nisha	3.9cm	
Jamie		72mm
Mark		109mm
Pat	15.7cm	

How much longer?

This example answers the questions which is longer, BE or GJ,
and how much longer?

```
    BE  = 4.5cm
    GJ = 5.0cm
So GJ is 0.5cm longer than  BE
    GJ is 5mm longer than  BE
```

Copy and complete this question to find which is longer, DG or CE

```
(1) DG = 4cm
    CE = 3.5cm
    ■  is 0.5cm longer than ■
    ■  is 5mm longer than ■
```

For each question find which is longer
and write how much longer in **cm** and in **mm**

(2) EF, FG	(5) BF, CF	(8) AB, GH
(3) CF, FH	(6) BG, GE	(9) DH, BE
(4) AE, EH	(7) FB, CE	(10) FH, CA

(11)   Draw a line which is 6cm long. Label it XY.

(12)   Draw a line which is 0.5cm longer than XY.

(13)   Draw a line which is 5mm shorter than XY.

Time Tiles

This envelope contains 16 Time Tiles
An activity for **2** people.

Using the
12 hour
clock.

For example.

A clock
face.

6:55pm

18:55

Five minutes
to 7 in the
evening

Using the
24 hour
clock.

In words.

**Match the tiles so that all touching edges
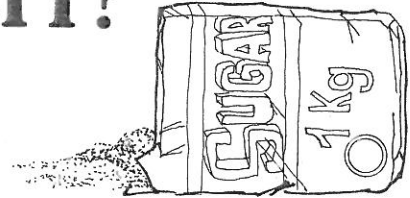show the same time in 4 different ways.**

Matching pairs

Some of the scales below have the same readings. *Find 4 pairs.*
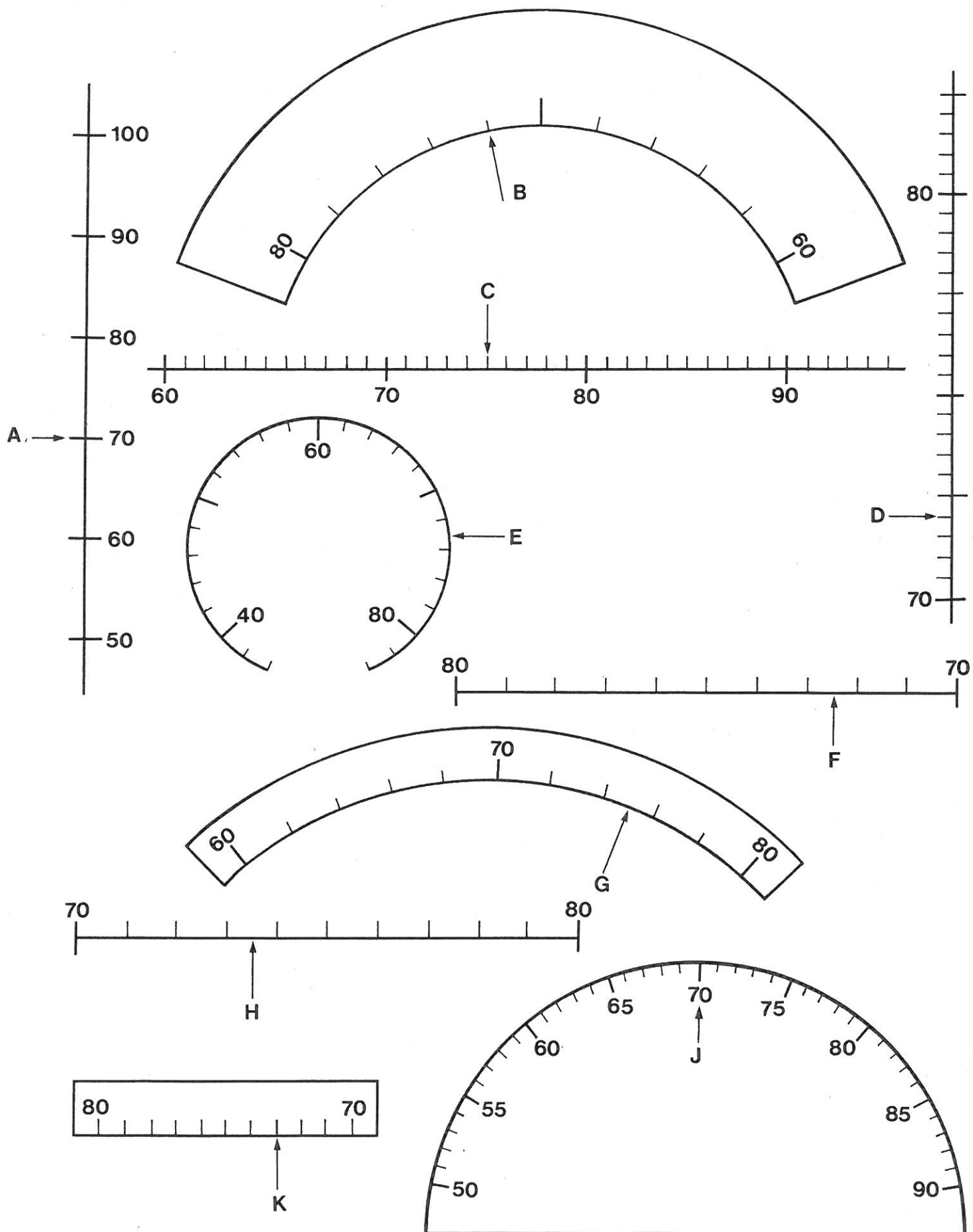
ABOUT HOW MUCH?

Work with a friend.
Discuss how heavy each of these objects is.
For each question choose the nearest weight.
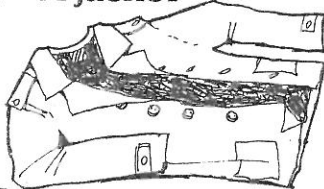
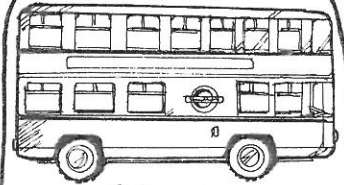### A full pint-bottle of milk
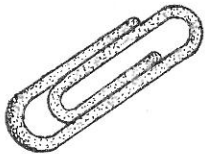
1 kg
0.5 kg
5 kg

A hair

1 g
10 g
0.1 g

A bus

2 tonnes
8 tonnes
0.2 tonnes
8 kg

A jacket

1 g   10 g
1 kg   10 kg
1 tonne   100 g

A paper-clip

1 g
10 g
5 g

Four 10p coins

50 g
250 g
5 g
500 g

A chair

2 kg
20 kg
200 kg
0.2 kg

An adult person

6 kg
60 kg
600 kg
6 tonnes

A baby

3 g
3 kg
30 kg
300 g
0.3 kg

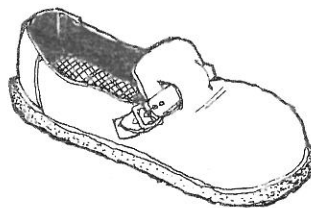### A cupful of sugar

3 g   3000 g
30 g   300 g

A ruler
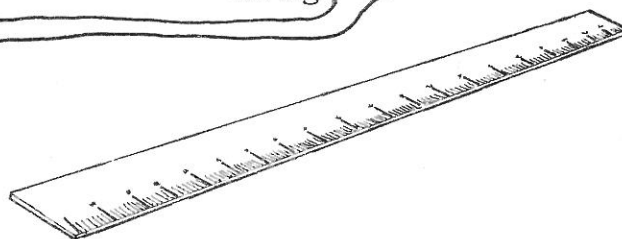
10 g   40 g
20 g   50 g
30 g   60 g

A calculator
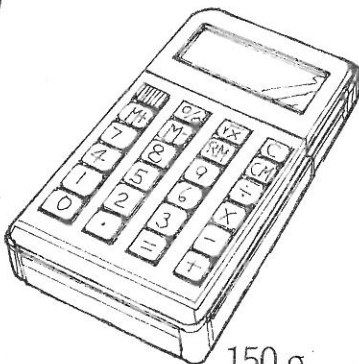
150 g
1500 g
15 g
15 kg

One shoe

50 g   1 kg
500 g   5 kg

Choose 5 more objects.
About how much does
each one weigh?

1000 g = 1 kg   1000 kg = 1 tonne

Good Guesswork

Jim is good at estimating because he uses his body as a guide.

MY HEIGHT IS 172 cm, SO THIS TABLE IS ABOUT 80 cm HIGH....
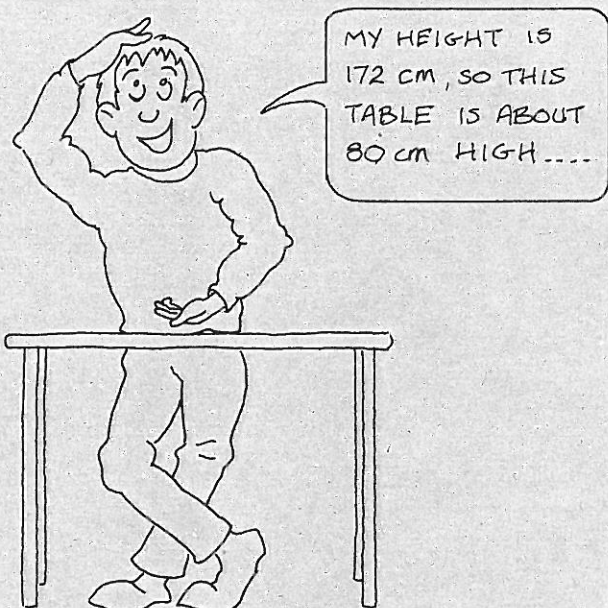
1. Why does he estimate 80cm?

...AND THIS POLE -VAULT MUST BE NEARLY 3m 50 cm.

2. Why does Jim estimate 3½m?

MY SPAN IS 20cm SO MY TABLE IS ABOUT 1 m LONG....

3. How does Jim estimate 1m and .....

--- AND ABOUT 50 cm WIDE.

..... 50cm?

4. Measure your height and your span. They may help you to estimate these.
   (a) the height of the door
   (b) the height of the room
   (c) the width of a filing cabinet

5. Jim went to a jumble sale . . . .
   (a) . . . . . he picks up a square table cloth. When he holds it up, it comes to his shoulders. Should he buy it?

   (b) . . . . . he measures a picture to be 4½ spans wide. Will it fit in his alcove which is 85cm wide?

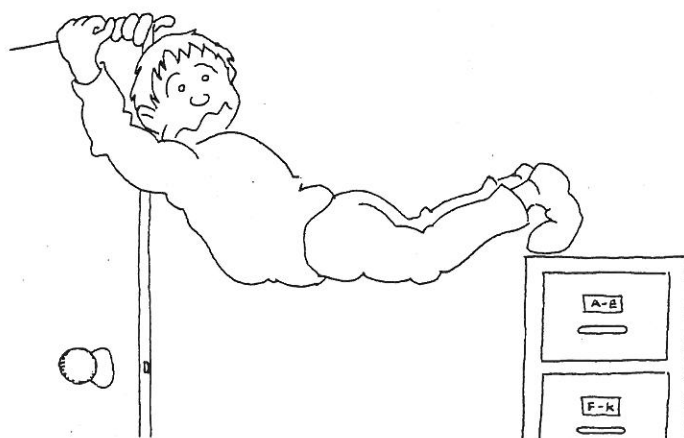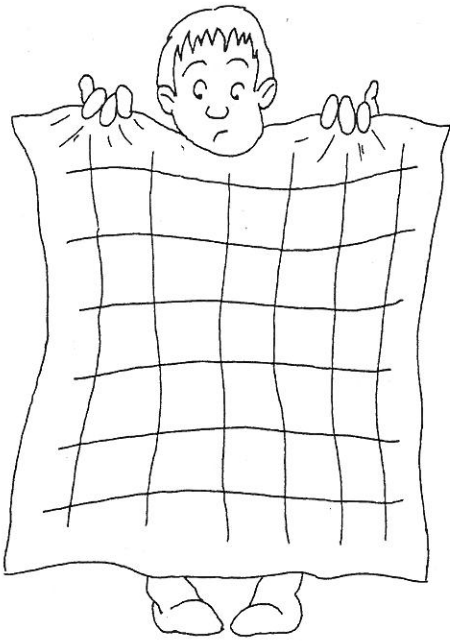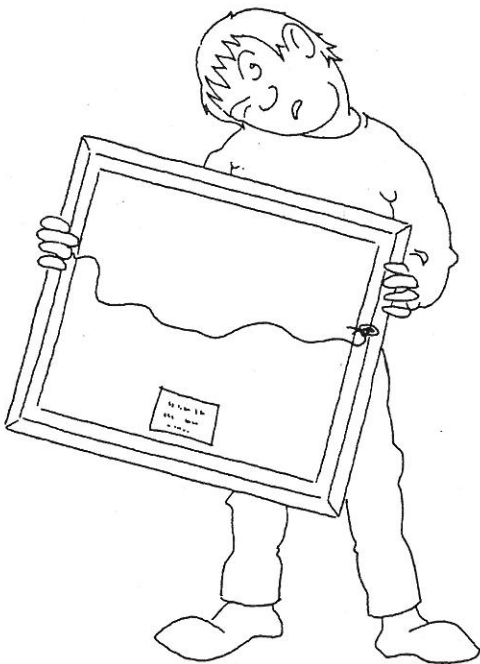A way of improving your estimating skills is to compare your guesses with the actual measurements.

6. Estimate the size of eight items, then measure them.

	Estimate	Actual measurement
Height of your table		
Length of folder		
Height of your teacher		
Length of your pencil		
Height of		

7. Estimate the size of these items, then compare your guesses with the measurements given in the answer book:

Length of a Mini car		
Length of a Volvo or Rolls Royce car		
Perimeter of this card		
Size of an L.P. record cover		
Height of a 12 storey building		
Height of a double-decker bus		

Thermometer Readings

This thermometer has a Celsius scale (°C).

The temperature shown on the thermometer is 27°C.

Boiling point of water.

27°C

Freezing point of water

100°
90°
80°
70°
60°
50°
40°
30°
20°
10°
0°
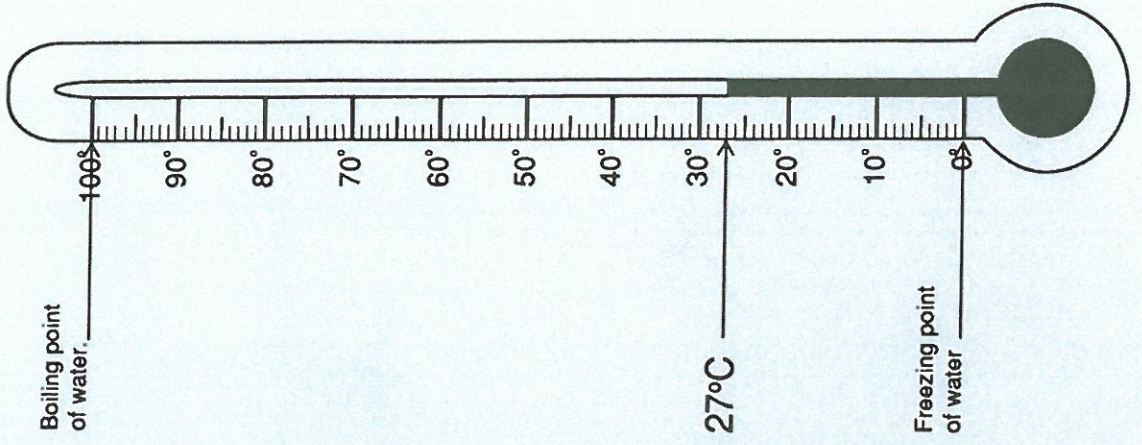
List the temperatures, in degrees Celsius (°C), shown on these thermometers.
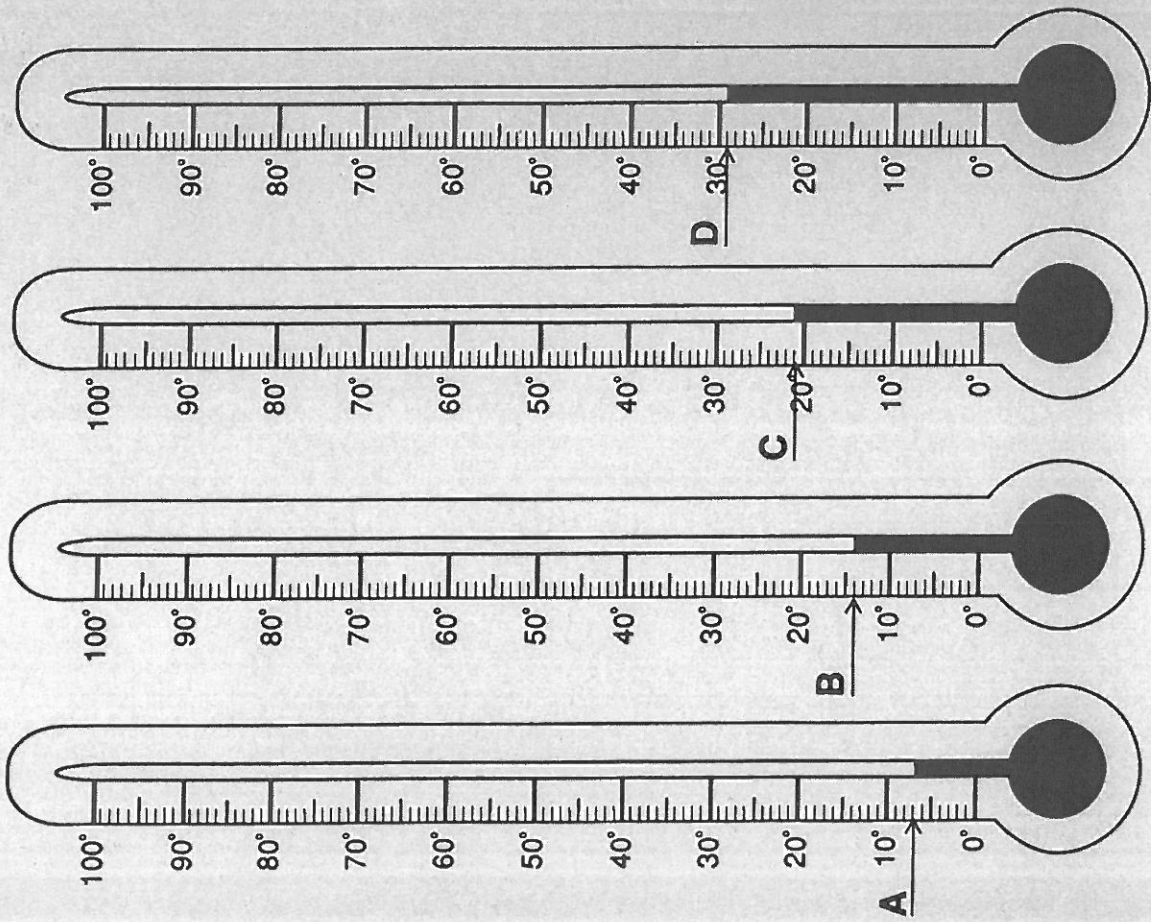
What temperatures would be recorded when the liquid reaches the height shown by the arrows?
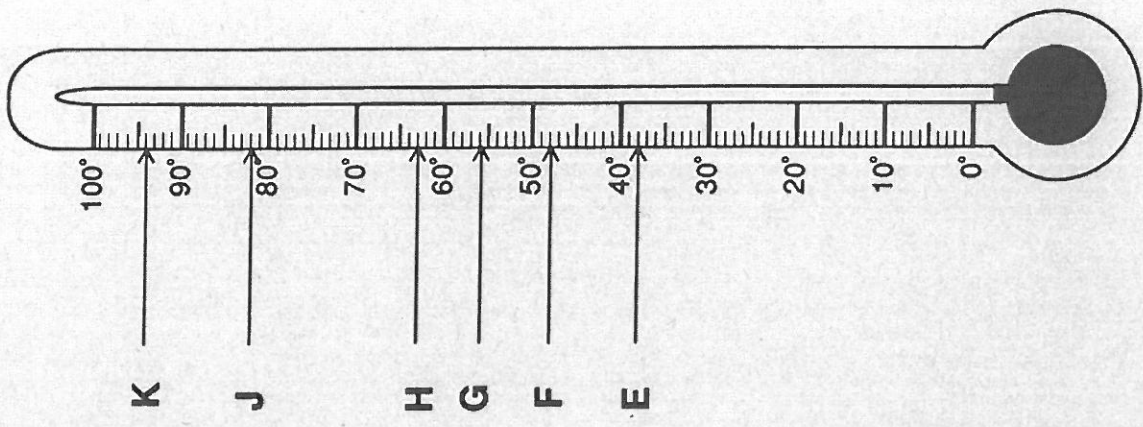
Make a list of these temperatures.

This thermometer has a Fahrenheit scale (°F).

The temperature shown
on the thermometer is
142°F.

Boiling point
of water.

142°F

Freezing point
of water.

220° 210° 200° 190° 180° 170° 160° 150° 140° 130° 120° 110° 100° 90° 80° 70° 60° 50° 40° 30°

What temperatures would be recorded when the
liquid reaches the height shown by the arrows?

Make a list of these
temperatures.

V

U

T

S
R

Q

P
N

M
L

220° 210° 200° 190° 180° 170° 160° 150° 140° 130° 120° 110° 100° 90° 80° 70° 60° 50° 40° 30°

This thermometer shows both degrees Fahrenheit (°F) and degrees Celsius (°C).

The temperature shown is 86°F or 30°C.

86°F or 30°C
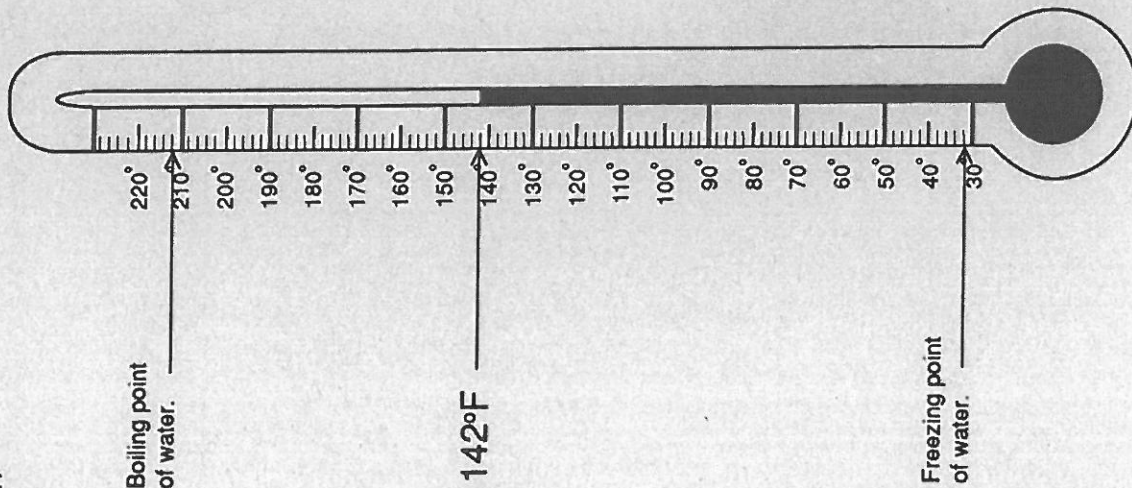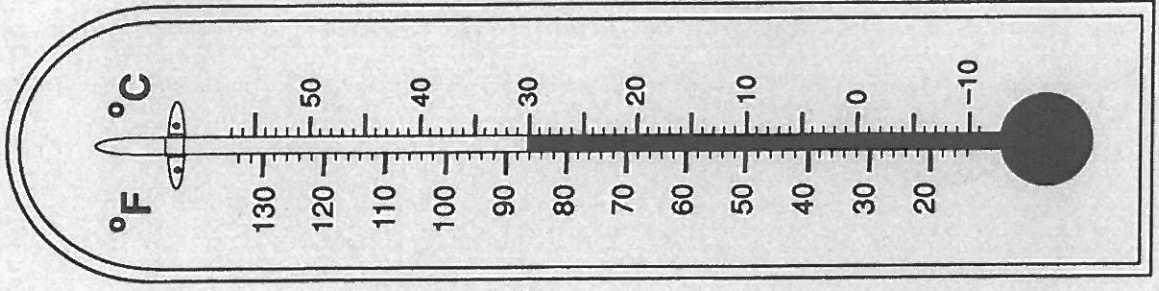
What temperatures would be recorded when the liquid reaches the height shown by the arrows?

Make a list of these temperatures, as accurately as you can, in
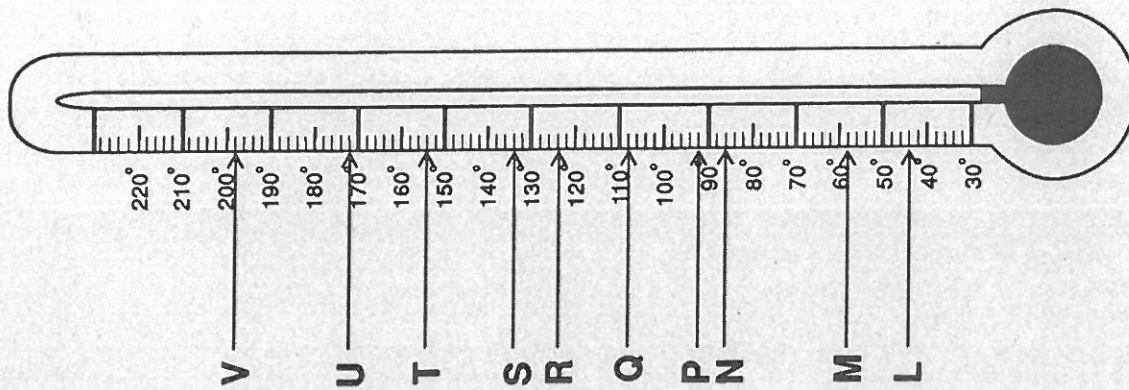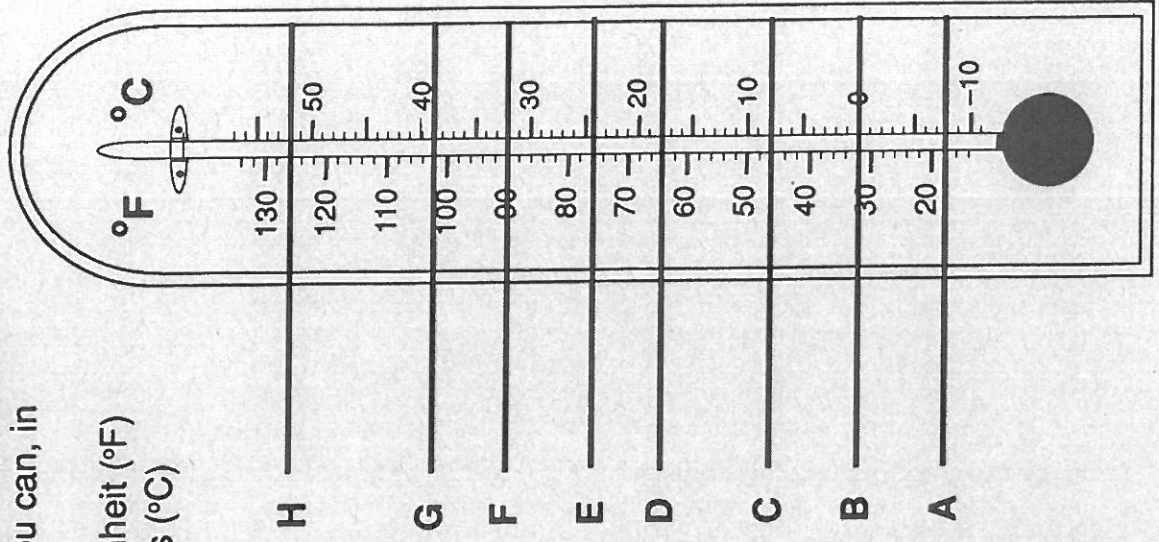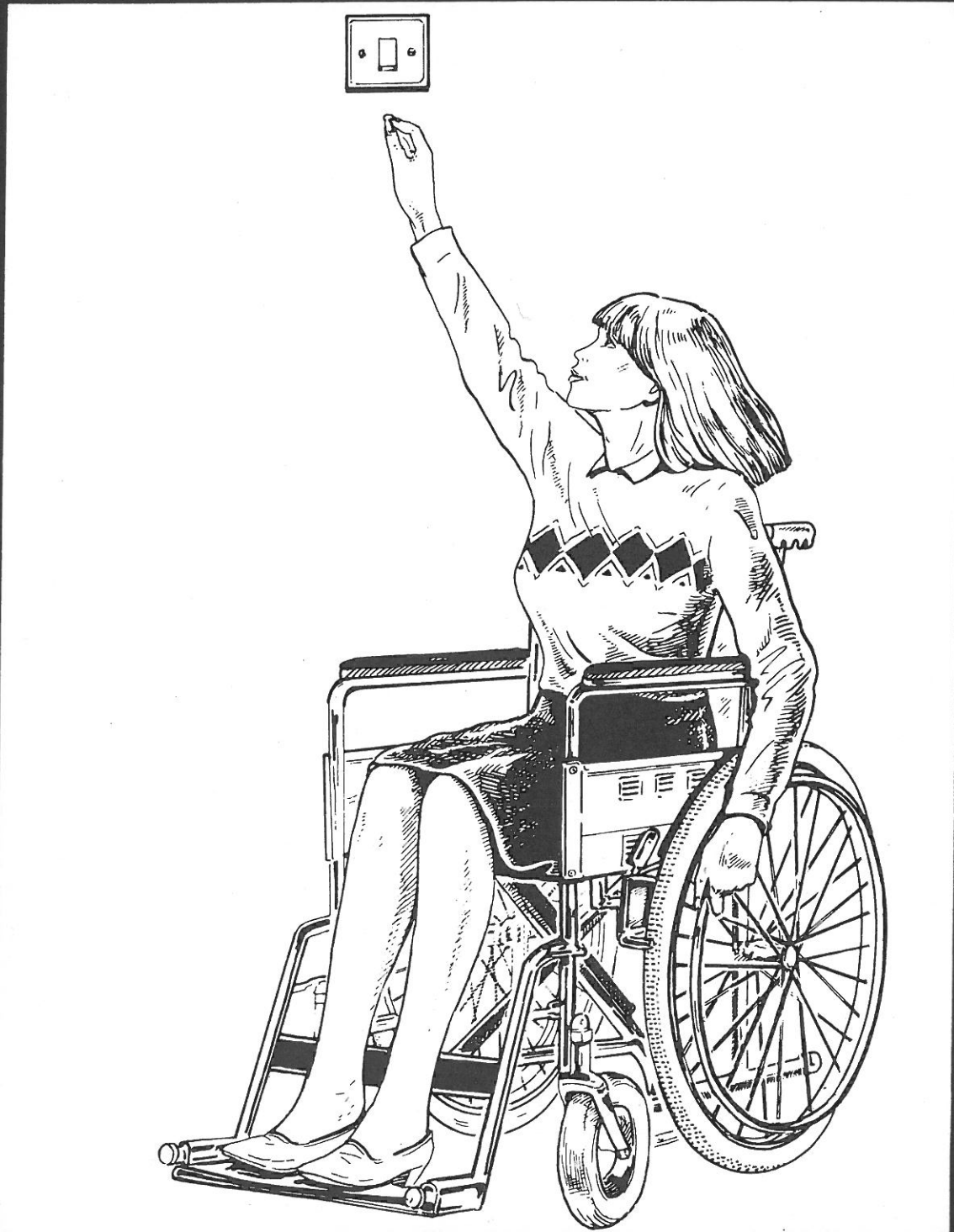
(a) degrees Fahrenheit (°F)
(b) degrees Celsius (°C)

H

G

F

E

D

C

B

A

Room to move

You will need a tape measure
and an upright chair (seat to be
approx. 45cm high)

Most things are designed with the average person in mind. This means that the disabled often have problems with reach and the space they need.

Work through this card to find out how much space the average person needs and then study the problems of the disabled.

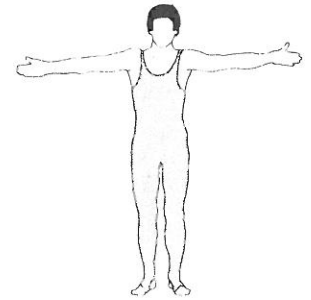# The average person — how much space does he take up?

Take turns to measure . . .

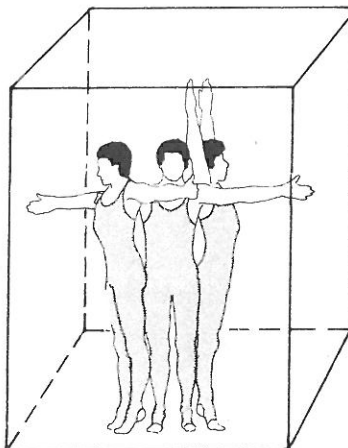(a) . . . as far up as you can reach, standing with both feet flat on the ground . .

(b) . . . how much further you can reach standing on tip-toe.

(c) . . . how far you can stretch sideways.

(d) If you were to make a box in which you could stand on tip-toe with your arms above your head and in which you could stand with your arms stretched out sideways and swivel right round, what would the dimensions (width/height/depth) of the box be?

(e) What would be the volume of your box?

Did you know that there are regulations governing the minimum amount of space that should be allowed for people working in offices, factories, etc?

Read the extract from the regulations.

Do you take up more or less space than you are supposed to?

"The number of persons habitually employed at a time to work in such a room as aforesaid shall not be such that the quotient derived by dividing by that number the number which expresses in square feet the area of the surface of the floor of the room is less than forty or the quotient derived by dividing by the first mentioned number, the number which expresses in cubic feet the capacity of the room is less than four hundred."

The Offices, Shops and Railway Premises Act, 1963 Paragraph 5, Subsection 2.

The disabled person — how much space does a person confined to a wheelchair take up?

Take turns to measure . . .

(a) . . . the greatest height you can reach sitting on the chair . . .

. . . how far forward you can reach without falling off your chair.

(b) What size box would you need for you and your wheelchair, so that you could stretch upwards and spin round while stretching forward?

(c) Do you take up more or less space in the chair than you did standing up?

(d) Take turns to measure . . .

. . . how far up the wall you can reach, sitting on the chair, facing the wall . . . and how far down you can reach . . .

. . . how far you can reach, up and down the wall with the chair alongside it.

(e) How do the different results for (d) compare? How do they compare with (a)?

(f) If you were confined to a wheelchair what do you think you would be able to reach? (Try light switches, electric sockets, windows, door handles, book shelves, telephone, etc.)

Most things are designed with the average person in mind. This means that the disabled often have problems with reach and the space they need.

Work through this card to find out how much space the average person needs and then study the problems of the disabled.

The average person — how much space does he take up?

Take turns to measure . . .
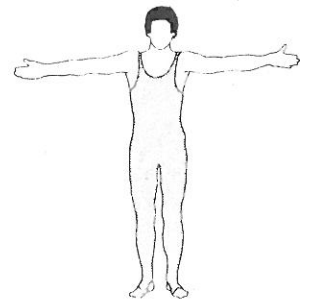
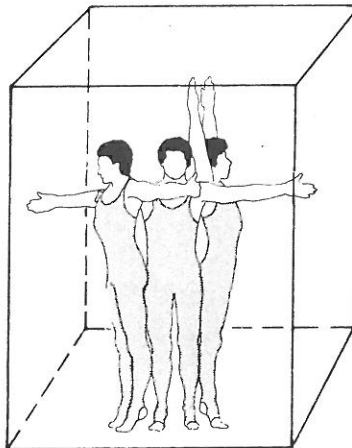(a) . . . as far up as you can reach, standing with both feet flat on the ground . .

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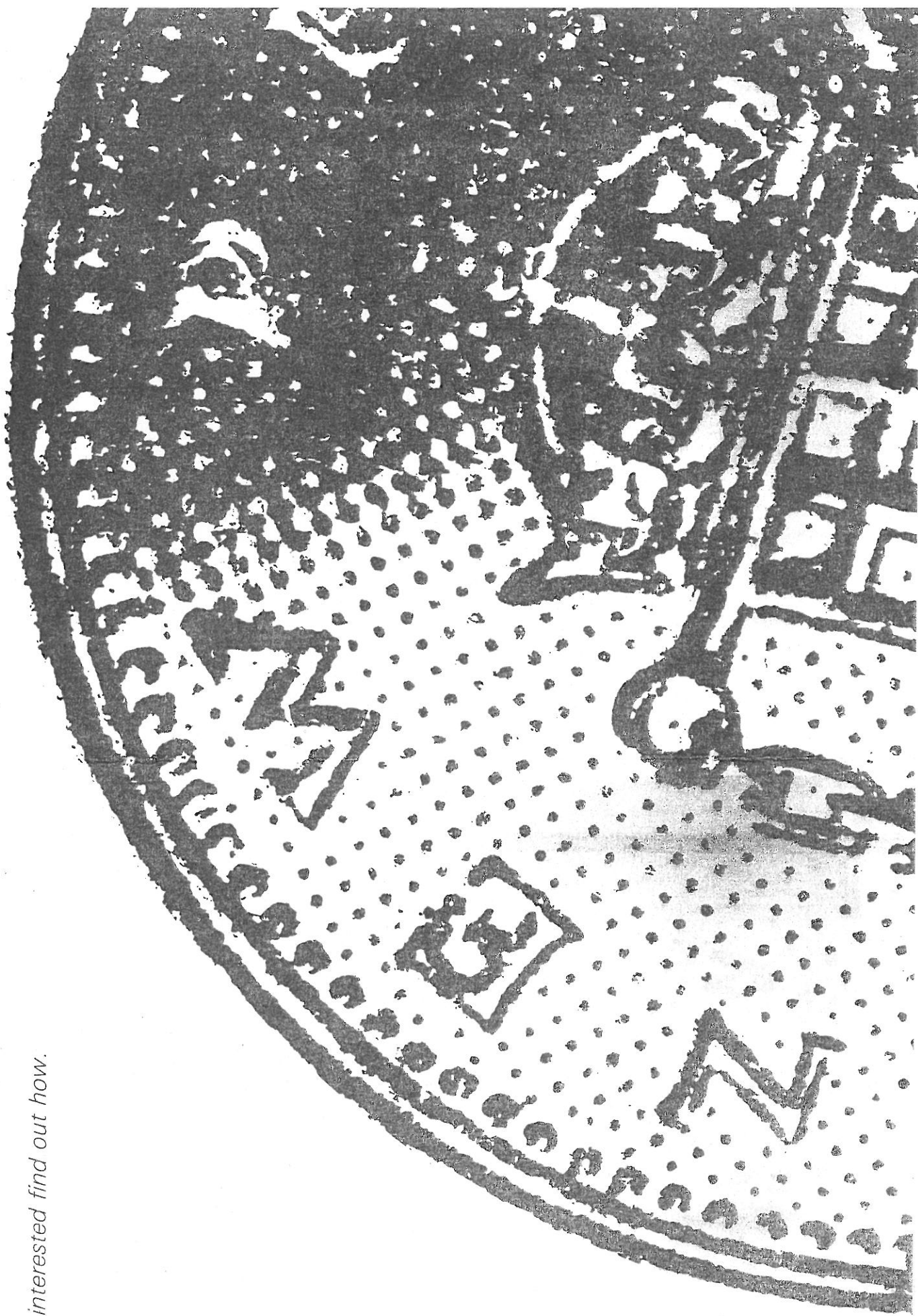Do you take up more or less space than you are supposed to?

"The number of persons habitually employed at a time to work in such a room as aforesaid shall not be such that the quotient derived by dividing by that number the number which expresses in square feet the area of the surface of the floor of the room is less than forty or the quotient derived by dividing by the first mentioned number, the number which expresses in cubic feet the capacity of the room is less than four hundred."

The Offices, Shops and Railway Premises Act, 1963 Paragraph 5, Subsection 2.

How thick?

If scientists or engineers need to measure something very thin they might use a micrometer gauge.

If you are interested find out how.

How thick is your writing paper?

There are probably 48 pages in your exercise book — double that is almost 100!

How thick is thread?

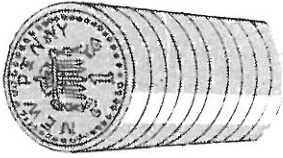Wind some thread around a ruler — keep the thread straight and no gaps.

How thick is a penny?

In fact it's very thin and so it's very very difficult to measure.

Make a pile of ten 1p coins:
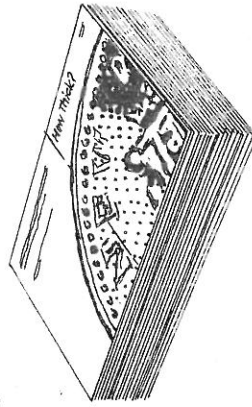
How tall is the pile?

How thick is one 1p coin?

How thick is this card?

You will probably need 100 cards.

How thick is a pile of 100 cards?
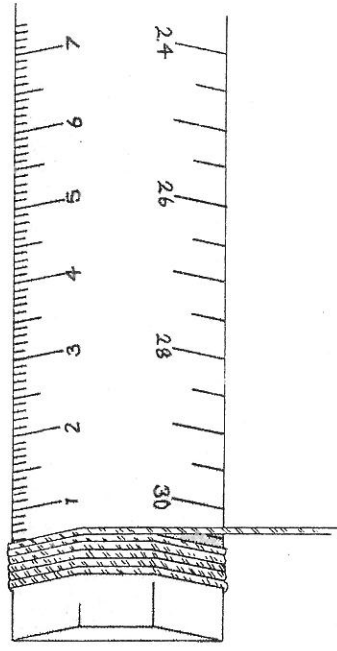
How thick is one card?

How thick is your graph paper?

You will need at least 100 sheets. (A packet of 500 sheets would be easier).
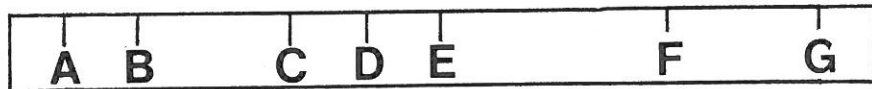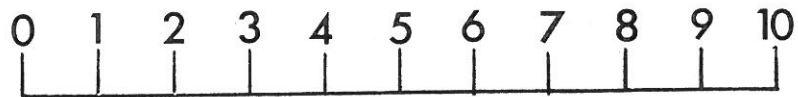
Find five more thin objects. *How thick are they?*

Do different papers have different thicknesses?

Less Marks Are Best !

```
0   1   2   3   4   5   6   7   8   9   10
```

```
| A B      C D E           F      G |
```

To measure all of the distances 1cm to 10cm
there are 7 marks on a strip.

For 1 cm we use AB

2 cm we use BC

3 cm ....

Copy and complete for this rule.

Can you find a way of marking the strip so that
all the measurements can be made with fewer
marks?   How few?

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

What about measuring to half a centimetre

```
0   1   2   3   4   5   6   7   8   9   10
```