

N3.7

Reading numbers from scales

objectives

- Count on and back in steps of 0.1, 0.2 and 0.25.
- Read and interpret scales on a range of measuring instruments.

starter

Use a counting stick.



Vocabulary

interval

Resources

counting stick
OHT N3.7a

Tell the class that the end at the left is nought or zero, and the other end is 20. Point to the midpoint of the stick, and ask:

Q What number is this? How do you know? (10, because it is half of 20)

Now point to the end of the third interval, the marker for 6. Ask again:

Q What number is this? How do you know?

Remind pupils that the total length of the stick is 20, and there are 10 intervals. Each interval is $20 \div 10 = 2$. Point to a few more numbers and ask pupils to identify them. If necessary, confirm by counting along the stick in twos.

Repeat with 50 at the right-hand end, then 5. Establish in the latter case that each interval is one half or nought point five. Confirm by counting along and back: nought, nought point five, one, one point five, ... Point to the ends of the seventh and ninth intervals, in each case asking:

Q What number is this?

Change the end of the stick to 1000. Point to different markers on the stick and ask pupils to say what number you are pointing to.

Indicate positions between the markers.

Q Estimate this number. Give your reasons.

Show **OHT N3.7a**. Work through the questions on the slide.

main activity

Vocabulary

scale
reading

Resources

OHTs N3.7b, N3.7c,
N3.7d
ITP *Measuring cylinder*
(optional)

Show **OHT N3.7b**. Tell the class that this is a scale to measure the amount of water in litres in a cylindrical water tank. The lowest mark indicates empty and the highest mark indicates full. Write 4 in the lower box. Point to the intervals below 4.

Q What does each of these intervals represent?

Emphasise that the four main intervals each represent 1 litre. Erase 4, and replace it with 12. Ask:

Q What does each main interval represent now? Explain why.

Q What number should be written in the upper box? How much water does this represent?

Q How much water is in the tank when it is full? Give your reasons.

Stress that pupils should first work out what the intervals are worth and then work out the values of the readings.

Erase the numbers in the boxes and repeat with other numbers. Make sure that the number is divisible by 4 if it is the lower box, and by 7 if it is the upper box.

If you wish, you could extend the above by using the ITP *Measuring cylinder*, downloaded from www.standards.dfes.gov.uk/numeracy. Select options and ask questions to consolidate pupils' understanding.

Show **OHT N3.7c**. Tell the class that the arrow on the top scale shows the weight of a melon. They have to mark the weight of the same melon on a different scale. Point to the first scale. Ask:

Q What does the smallest interval represent? (one tenth of a kilogram, or 0.1 kg)

Q What is the weight of the melon? (1.4 kg) **How do you know?**

Point to the second scale.

Q What does the smallest interval represent? (one fifth of a kilogram, or 0.2 kg)

Q Where would 1.4 kg be on this scale? How do you know?

Show **OHT N3.7d**. Tell the class that the diagram represents a scale for weighing. The pointer rotates clockwise from the zero or nought position. Write 14 in the empty box. Ask:

Q What does the interval on the scale represent? (2 kg)

Q What interval does the pointer lie within? (between 8 kg and 10 kg)

Q Is the pointer nearer to 8 or nearer to 10?

Q Estimate the weight on the scale. (approximately 8.25 kg)

Erase 14. Repeat with 3.5 (estimated weight 2.1 kg).

other tasks

Springboard 7

Unit 11

Assess and review 3

Unit 11 section 2: Units of mass

1 Reading scales

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2 More scales

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Unit 11 section 3: Capacity

2 More metric units

page 376

Assess and review 3

Question 7

page 414

plenary

Resources

OHT N3.7e

Show the class the first scale on **OHT N3.7e**. Tell them that it shows part of a number line. They have to write the number shown by the arrow. If necessary, prompt with questions such as:

Q What does each interval represent? (100)

Refer the class to the second scale. Again, they have to write the number shown by the arrow. Prompt with questions such as:

Q What numbers should we write on the two taller markers? (1000, 1001)

Q What do the smallest intervals represent? (one half or 0.5)

Q What number should go in the box? (1000.5) **Explain your thinking.**

Refer the class to the third scale. Invite a pupil to mark with an arrow the point 7500. Prompt if necessary with:

Q How many intervals are there between 0 and 10 000? (10)
What does each interval represent? (1000)

Q Between which two 'thousands' does 7500 lie? (7000 and 8000)

Refer the class to the fourth scale. Remind them that the number line extends to negative numbers and that negative numbers also appear on temperature scales and on the scales of graphs.

Q Where is the point -1.5 on the line? Where is 0.45 ?

Once again, if necessary, prompt with questions such as:

Q What numbers should we write on the medium sized markers?
(-1.5 , -0.5 , 0.5 , 1.5)

Q What do the smallest intervals represent? (one tenth or 0.1)

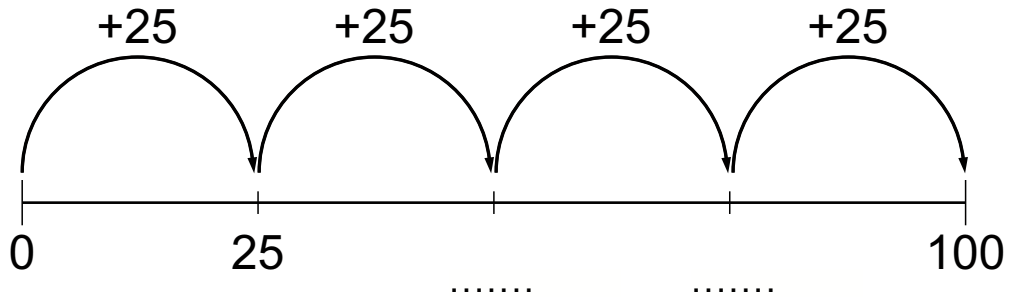
Q Between which two 'tenths' does 0.45 lie? (0.4 and 0.5)

Remember

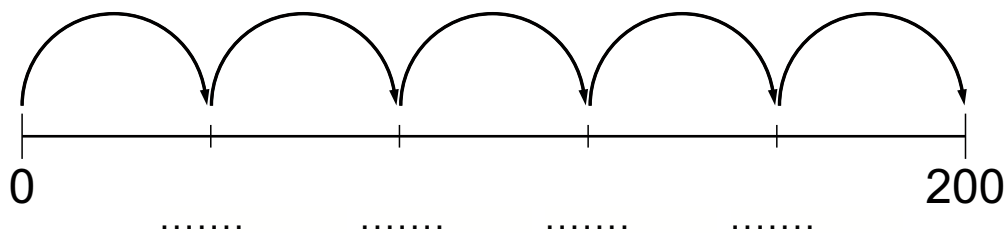
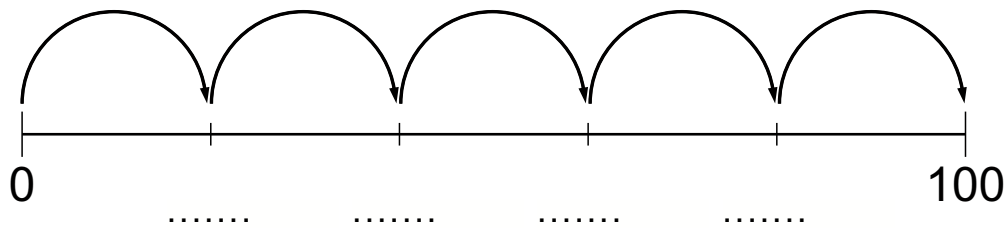
- When reading a scale, decide what each interval represents, and label the divisions or marks on the scale.
- When you estimate a reading, decide what two numbers (or measurements) the reading lies between. Then decide which of them it is nearer to.

The number line goes from 0 to 100 using 4 equal steps. The size of each step is 25.

Fill in the missing numbers on the line.

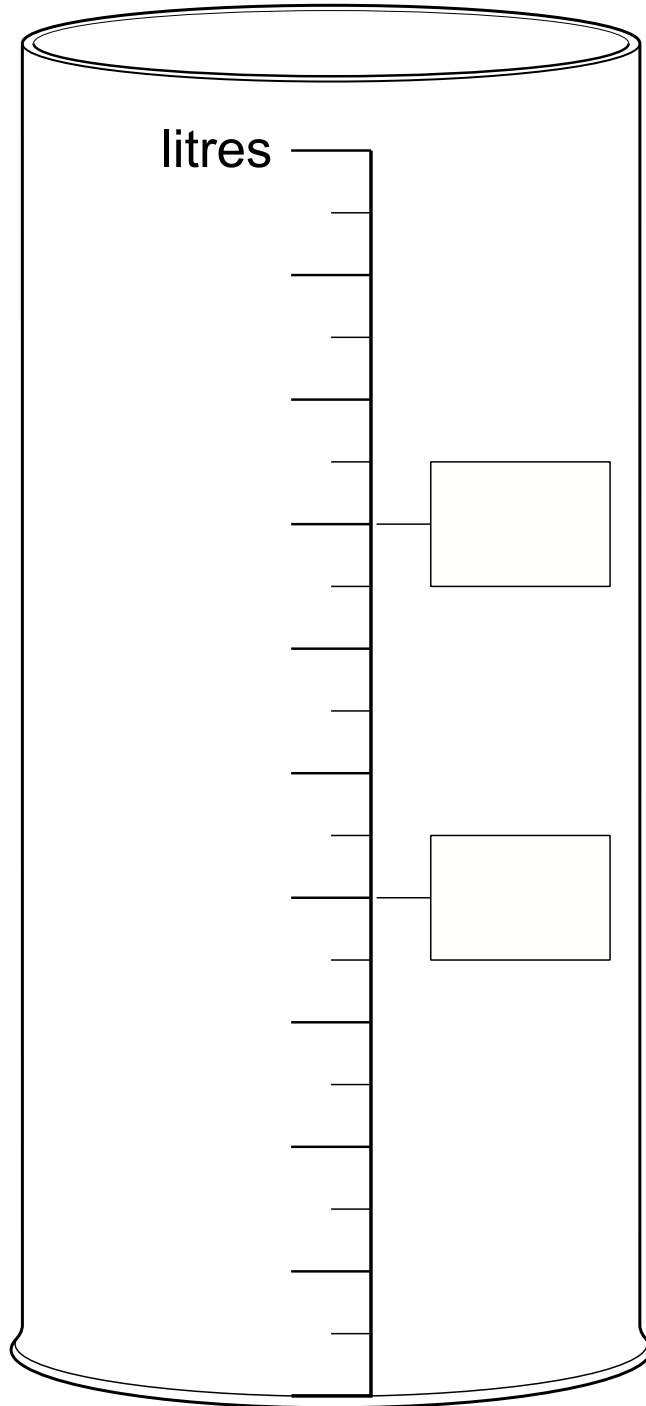


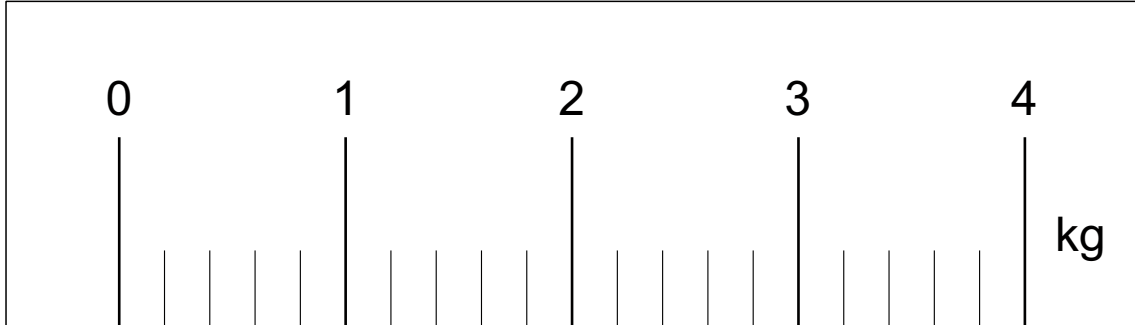
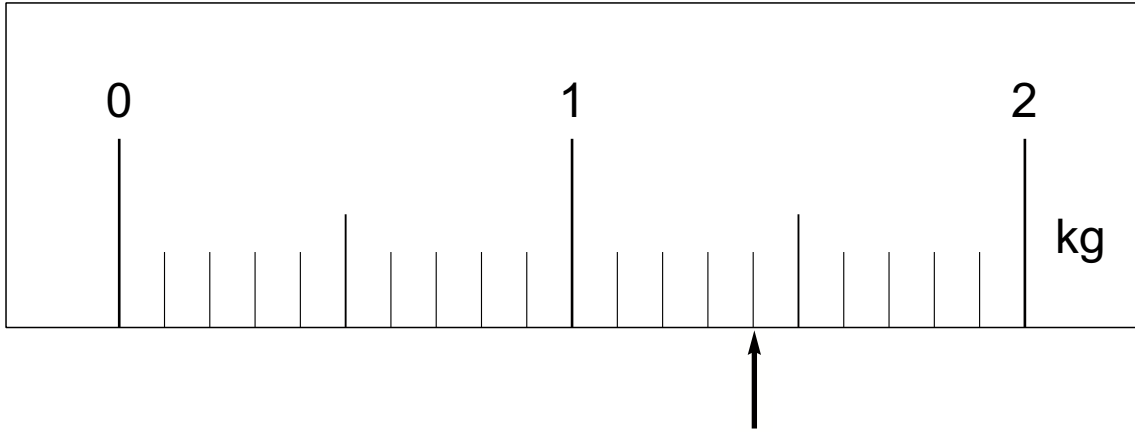
Fill in the missing numbers on these lines.

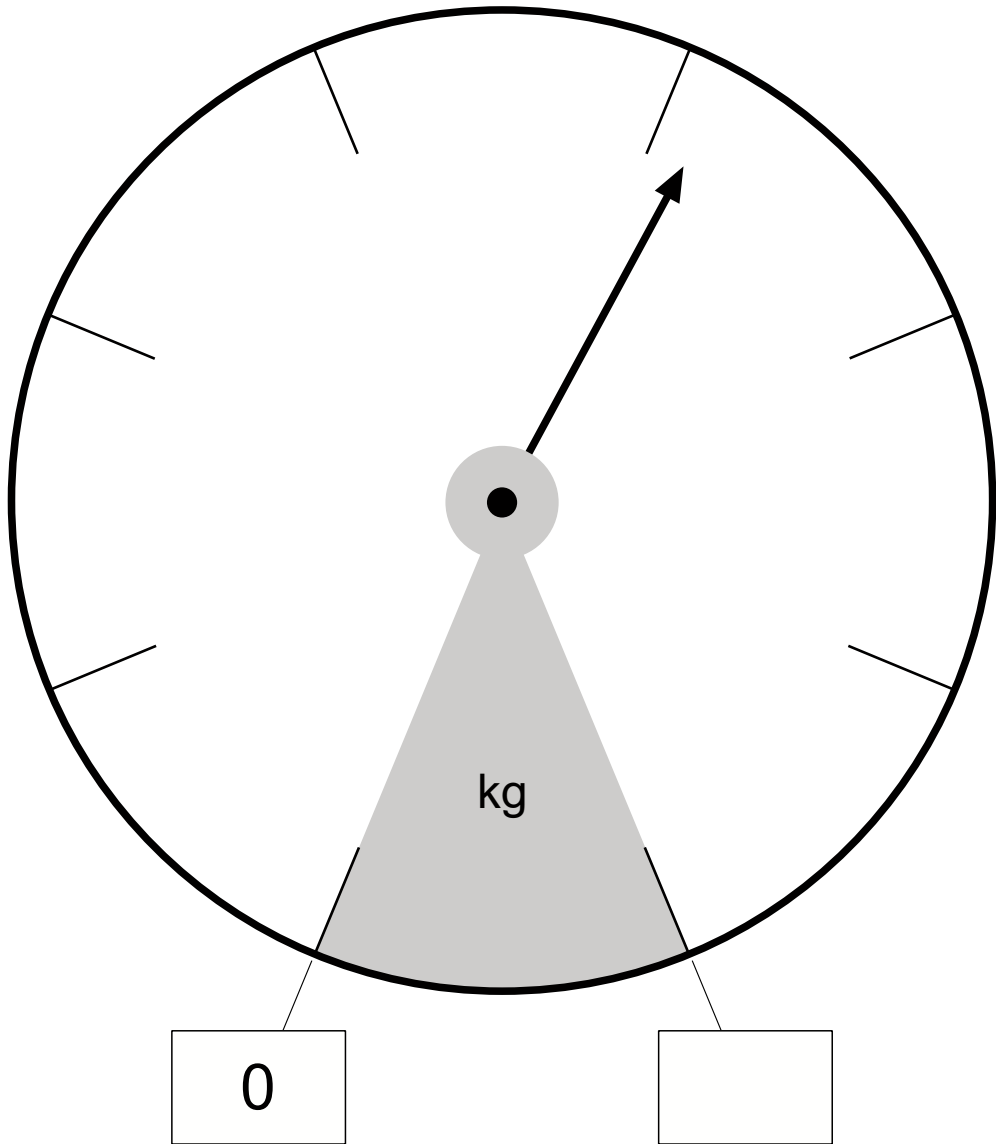


A number line goes up in steps of size 15.

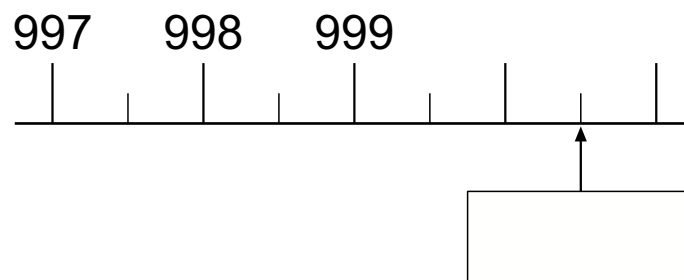
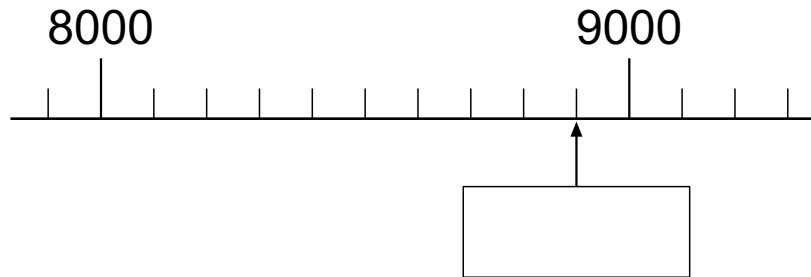
How many steps will it take to get from 0 to 60?



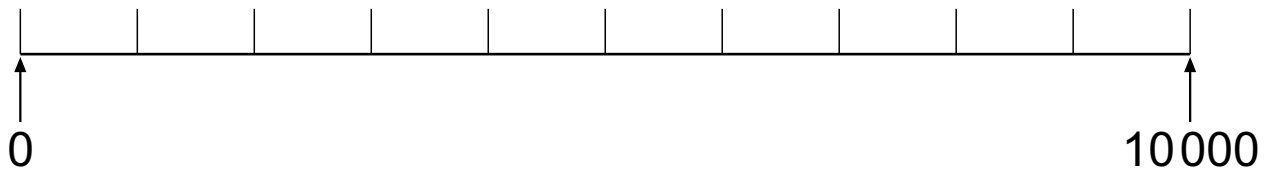




Write the number shown by each arrow.



Draw an arrow to show the point 7500.



Draw arrows to show the points -1.5 and 0.45 .

