Teaching for Mastery

Questions, tasks and activities to support assessment

Year 3

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Mastery Check

Please note that the following columns provide indicative examples of the sorts of tasks and questions that provide evidence for mastery and mastery with greater depth of the selected programme of study statements. Pupils may be able to carry out certain procedures and answer questions like the ones outlined, but the teacher will need to check that pupils really understand the idea by asking questions such as 'Why?', 'What happens if …?', and checking that pupils can use the procedures or skills to solve a variety of problems.

Assessment Booklet.

Name:

Class:

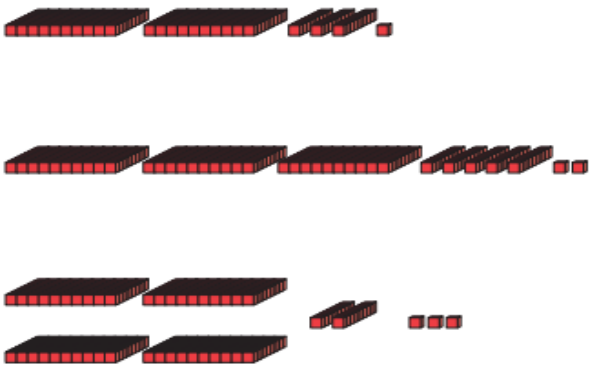
D.O.B

Please note, the assessments contained within can all be found on the www.ncetm.com website.

Number and Place Value

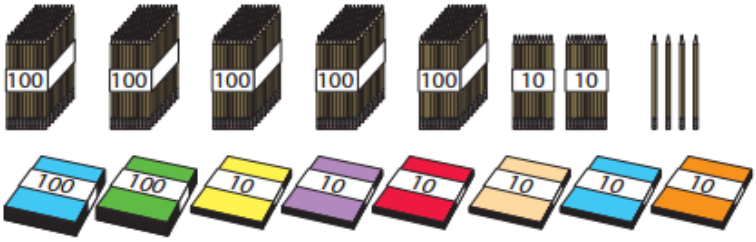
Mastery

What number is represented in each set?



Find the number of pencils.

Find the number of exercise books.



Guide pupils to use practical equipment to deepen their understanding of place value and apply their knowledge of place value in mental and written calculation.

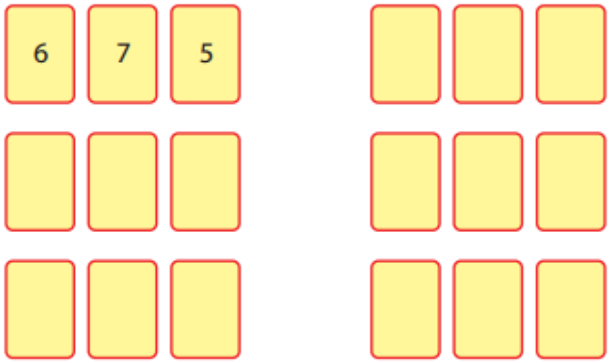
- 8 hundreds, 3 tens and 6 ones together make ☐.
- 457 is made of ☐ hundreds, ☐ tens and ☐ ones.
- 250 is made of ☐ hundreds and ☐ tens.

Notes:

Mastery

Megan has made a 3-digit number with these cards.

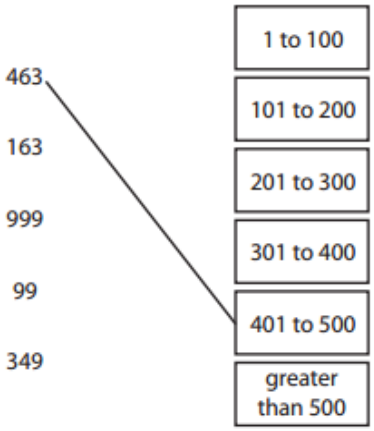
What other 3-digit numbers can she make with these cards?



What is the largest number she can make?

Consider whether or not children are working systematically.

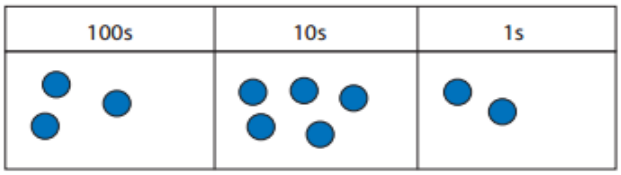
Join each number to the set that it belongs to.



Notes:

Mastery with Greater Depth

What is the value of the number represented by the counters in the place value grid?

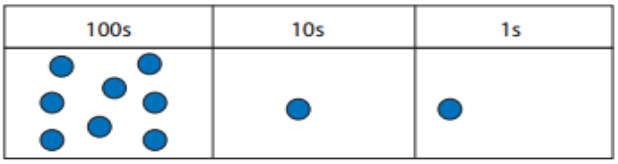


Using all of the counters, how many different numbers can you make?
Have you made all the possible numbers?

Explain how you know.

Mastery with Greater Depth

Captain Conjecture says 'The number in the place value grid is the largest 3-digit number you can make using all 10 counters'.



Do you agree?

Explain your reasoning.

674 is made of 6 hundreds, 7 tens and 4 ones.
674 is also made of 67 tens and 4 ones.
674 is also made of 6 hundreds and 74 ones.

Find different ways of expressing:

- 630
- 704
- 867

Notes:

Mastery with Greater Depth

Captain Conjecture says, 'If you add 6 to a number ending in 7 you will always get a number ending in 3.' Is he correct?

Explain your answer.

Insert a digit into each box so that the numbers are in order from smallest to largest.

□4 6	□3 2	3□1	□6 6	□5□

Which digits can you place in the boxes to create the largest interval between any two consecutive numbers?

Notes:

Addition and Subtraction

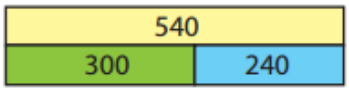
Mastery

What do you notice?

Is there a relationship between the calculations?

500 + 400 =	523 + 400 =	523 + 28 =
400 + 500 =	423 + 500 =	423 + 28 =
300 + 600 =	323 + 600 =	323 + 28 =
200 + 700 =	223 + 700 =	223 + 28 =
100 + 800 =	123 + 800 =	123 + 48 =

Write the four number facts that this bar model shows.



□ + □ = □

□ + □ = □

□ − □ = □

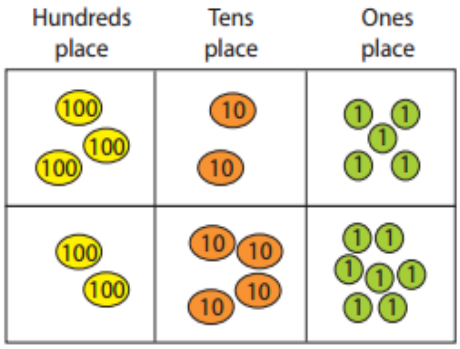
□ − □ = □

Using coins, find three ways to make £1.

Notes:

Mastery

Solve calculations using a place value grid and equipment alongside a column method to demonstrate understanding.



325
+ 247
_____

Sam has completed these calculations, but he is incorrect.
Explain the errors he has made.

325	355
+ 247	− 247
581	112

Complete these calculations. What do you notice?

3 + 7 =	8 + 2 =	6 + 4 =
30 + 70 =	80 + 20 =	60 + 40 =
33 + 7 =	88 + 2 =	66 + 4 =
333 + 7 =	888 + 2 =	666 + 4 =
300 + 700 =	800 + 200 =	600 + 400 =

Notes:

Mastery with Greater Depth

For positive integers are the following statements always, sometimes or never true?

- The sum of 2 odd numbers is even.
- The sum of 3 odd numbers is even.
- Adding 5 to a number ending in 6 will sum to a number ending in 1.
- Adding 8 to a number ending in 2 will always sum to a multiple of 10.

Explain why in each case.

Flo and Jim are answering a problem:

Danny has read 62 pages of the class book, Jack has read 43. How many more pages has Danny read than Jack?

Flo does the calculation 62 + 43. Jim does the calculation 62–43.

Who is correct?

Explain how you know.

Pupils might demonstrate using a bar model to explain their reasoning.

Sophie has five coins in her pocket. How much money might she have?

What is the greatest amount she can have?

What is the least amount she can have?

If all the coins are different:

What is the greatest amount she can have?

What is the least amount she can have?

Notes:

Mastery with Greater Depth

There are six 3-digit addition calculations shown below.

a) 124 + 233 = _____

b) 644 + 172 = _____

c) 366 + 277 = _____

d) 579 + 221 = _____

e) 791 + 163 = _____

f) 567 + 233 = _____

Which calculations have no carry digits?

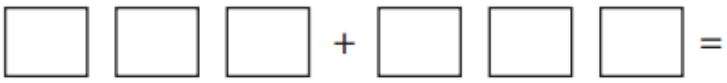
Which calculations have a carrying digit only once?

Which calculations have a carrying digit twice?

Which calculation has the largest answer?

Which calculation has the smallest answer?

Check that children are looking at the numbers involved, rather than doing the calculations.



Throw a 1 to 6 dice and each time record the digit in one of the place holders. The aim is to get the sum as low as possible. Repeat to find different answers.

Could you have done it in a different way?

Compete against a friend and compare your answers.

Notes:

Multiplication and Division.

Mastery

What is the relationship between these calculations?

3×4 4×8

4×3 8×4

Children should understand that multiplication is commutative.

What do you notice about the following calculations?

3×4 3×8

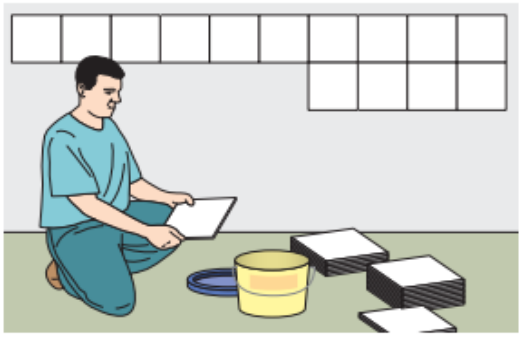
4×4 4×8

3×5 3×10

What is 3×4?

What is 13×4?

Asking 'How did you get that?' can help you decide whether children are working efficiently with questions like 13×4 by, for example, calculating 10×4 and adding 3×4, and that 3×4 is not obtained by counting in 1s.



Roger is laying tiles.

He has 84 tiles altogether.

How many complete rows of tiles can he make?

Complete the following:

$3 \times \square = 12$ $4 \times \square = 20$

$\square \times 3 = 15$ $8 \times \square = 24$

Use a column method to calculate the following:

123×3 324×4 234×8

Notes:

Mastery

The following problems can be solved by using the calculation 8 ÷ 2. True or false?

- There are 2 bags of bread rolls that have 8 rolls in each bag. How many rolls are there altogether?
- A boat holds 2 people. How many boats are needed for 8 people?
- I have 8 pencils and give 2 pencils to each person. How many people receive pencils?
- I have 8 pencils and give 2 away. How many do I have left?

Notes:

Mastery with Greater Depth

What is the relationship between these calculations?

2×3	4×3
2×30	4×30
20×3	40×3
$20 \times 3 \times 10$	$40 \times 3 \times 10$

Children should use their knowledge of place value to mentally calculate by multiples of 10.

Write these addition statements as multiplication statements:

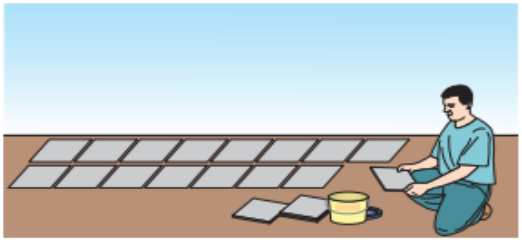
$2 + 2 + 2 + 2 + 4$

$3 + 3 + 3 + 2 + 4$

Mastery with Greater Depth

Make up a problem for 13×4 and solve it.

Write a story for $18 \div 3$.



Roger has 96 patio slabs.

Using all of the slabs find three different ways that he can arrange the slabs to form a rectangular patio.

☐☐ × ☐ = ?

Putting the digits 1, 2 and 3 in the empty boxes, how many different calculations can you make?

Which one gives the largest answer?

Which one gives the smallest answer?

Find the missing digits.

$$\begin{array}{r} 2\square \\ \times \quad 8 \\ \hline 176 \end{array} \qquad \begin{array}{r} 2\square \\ \times \quad \square \\ \hline 112 \end{array} \qquad \begin{array}{r} 1\square 4 \\ \times \quad \square \\ \hline 736 \end{array}$$

Notes:

Mastery with Greater Depth

Sam is planting onions in the vegetable plot in his garden.
He arranges the onions into rows of 4 and has two left over.
He then arranges them into rows of 3 and has none left over.
How many onions might he have had?

Explain your reasoning.

Notes:

Fractions.

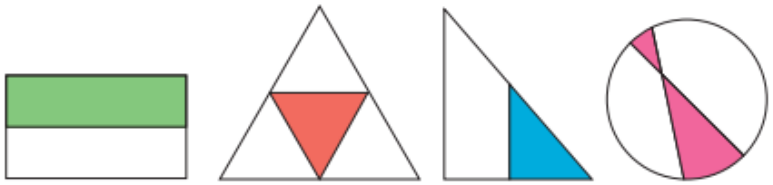
Mastery

Six girls share three bars of chocolate equally.
Four boys share two bars of chocolate equally.

Does each girl get more chocolate, less chocolate or the same amount of chocolate as each boy?
Draw a picture to show that your reasoning is correct.

True or false?

Explain why.



$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{2}$ $\frac{1}{4}$

Shade in 0·7 of this rectangle.

Fill in the numerators to make the answer less than 1.
Find three different ways to complete the calculation.

$\frac{\quad}{8} + \frac{\quad}{8} =$

Notes:

Mastery

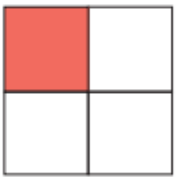
On a number line labelled 0 to 1, mark $\frac{1}{5}$, $\frac{2}{5}$ and $\frac{4}{5}$.

On a number line labelled 0 to 1, mark $\frac{1}{6}$, $\frac{1}{3}$ and $\frac{1}{2}$.

Hamsa says the diagrams below show that $\frac{1}{4} > \frac{1}{2}$.

Do you agree?

Explain why.



What fraction of the bar does each section represent?

Draw two more bars of the same size and divide one into eighths and the other into sixths.

Which number is greater, a tenth, an eighth or a sixth?

How do the bars help you to explain your reasoning?

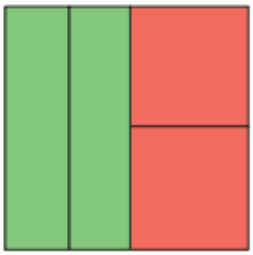
Notes:

Mastery with Greater Depth

Jo ate $\frac{1}{4}$ of a pizza and Sam ate $\frac{1}{2}$ of what was left. Mike ate the rest of the pizza.
Draw a diagram to show how much pizza Jo, Sam and Mike each ate.

The shape is divided into 4 equal parts. Do you agree?

Explain why.



This is 0·4 or $\frac{2}{5}$ of a bag of marbles. How many marbles are in a full bag?

Fill in the numerators to make the calculation correct.
How many ways can you do it?

Explain how you know you have found them all.

$\frac{\quad}{8} + \frac{\quad}{8} = 1$

Notes:

Mastery with Greater Depth

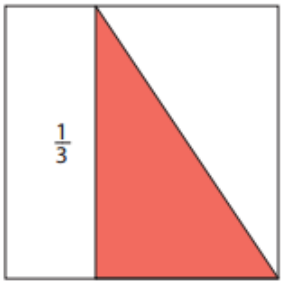
On a number line labelled 0 to 1, mark $\frac{1}{6}$, $\frac{1}{3}$ and $\frac{1}{2}$.

How big is the interval from $\frac{1}{6}$ to $\frac{1}{3}$?

How big is the interval from $\frac{1}{6}$ to $\frac{1}{2}$?

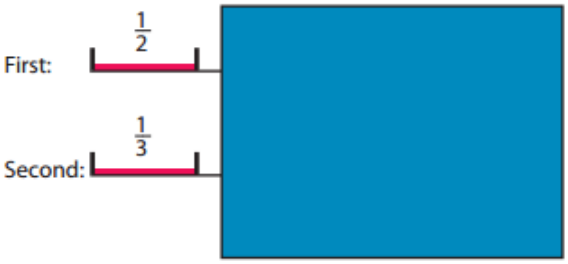
What fraction of the square is shaded?

Explain your reasoning.



Only a fraction of each line is shown. The rest is hidden behind the blue screen. Which whole line is the longer?

Explain your reasoning.



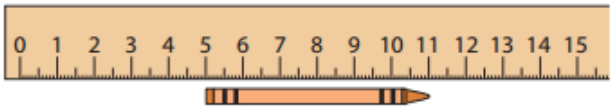
Notes:

Measurement.

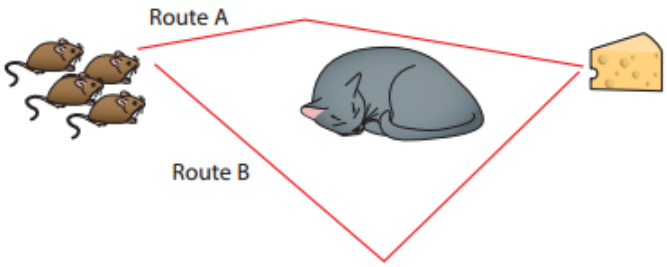
Mastery

I have 2 m of ribbon. How many 60 cm lengths can I cut from it?

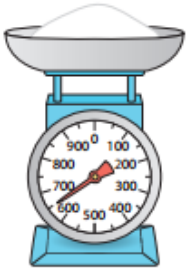
How long is the crayon?



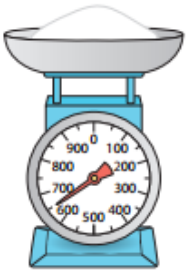
Find the total length of route A.
Find the total length of route B.
How much longer is route A than route B?



What is the mass of flour on the scales?



I need $\frac{3}{4}$ kg of flour to make a cake.
How much more flour do I need to add to the scales?



Notes:

Mastery

There is a tea urn and a teapot. The bottles next to them show their capacity.

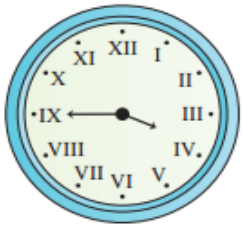
How much more water does the urn hold than the teapot?

£2·60 + ☐ = £5·00

If I buy a sandwich for £2·20 and a drink for 90p, how much change do I get from £5?

Ellie buys 2 pencils. She pays with a £2 coin and gets 70p change.
How much did each pencil cost?

Match the two clocks that show the same time.



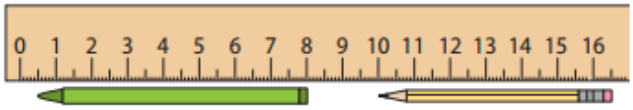
Notes:

Mastery with Greater Depth

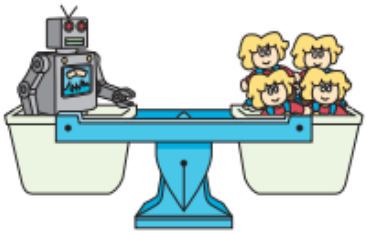
A crocodile is 3 times as long as a pig. An elephant is 1·2 m longer than the crocodile. The elephant is 4·2 m long. How long is the pig?

Ahmed's ruler is broken. Explain how he can still use it to measure things in the classroom.

What is the difference in length between the pen and the pencil?



6 toy cars balance 2 dolls. 4 dolls balance 1 toy robot.

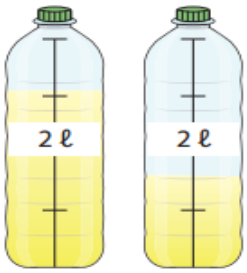


If the robot weighs 3 kg, what does each toy car weigh?

Notes:

Mastery with Greater Depth

These lemonade bottles each have a capacity of 2 litres.
One of them is $\frac{3}{4}$ full, and one of them contains $\frac{3}{4}$ of a litre of water.
Which is which?

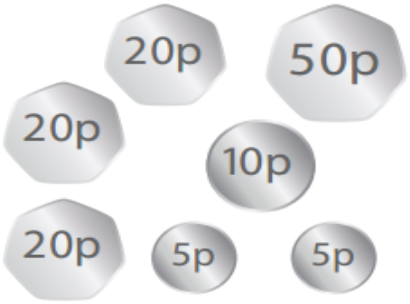


How much water is in the bottle which is $\frac{3}{4}$ full?
What fraction of the bottle is full in the bottle which contains $\frac{3}{4}$ of a litre?

Sophie and Ravi have saved some money. Altogether they have saved £35. Sophie has saved £4 more than Ravi. How much have they each saved?

Sam and Tom share this money equally.
Divide the coins into two equal groups.
Could three friends share the money equally?

Explain your reasoning.



These clocks have only one hand, but can you suggest a time that each could be showing?

A B C

Explain your reasoning.

Notes:

Geometry.

Mastery

Have a range of 3-D shapes in a 'feely bag'.

Can you feel for the cube, the cuboid, the pyramid, the cylinder and the cone?

Explain how you know.

Describe what you are feeling to your classmates and see if they guess what the shape is.

Can you draw a triangle with:

- 1 right angle?
- 2 right angles?

Can you draw a quadrilateral with:

- 1 right angle?
- 2 right angles?
- 5 right angles?
- No right angle?

If some of these are impossible, can you explain why?

Notes:

Mastery with Greater Depth

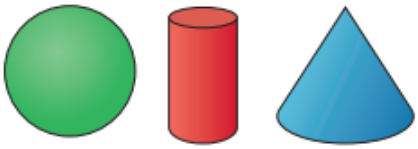
True or false?

The shape of a cross section of a sphere is always a circle.

The shape of a cross section of a cylinder is always a circle.

The shape of a cross section of a cone is always a circle.

Explain your reasoning.

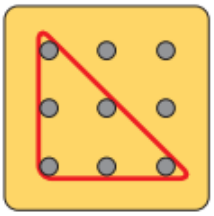


sphere cylinder cone

Can you identify a 3-D shape where the cross section is always a square?

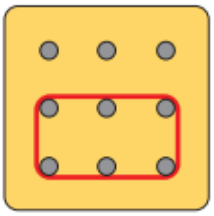
How many different triangles can you find on a 3×3 pin geoboard?

How do you decide that they are different?



How many different quadrilaterals can you find on a 3×3 pin geoboard?

How do you decide that they are different?



Notes:

Statistics.

Mastery

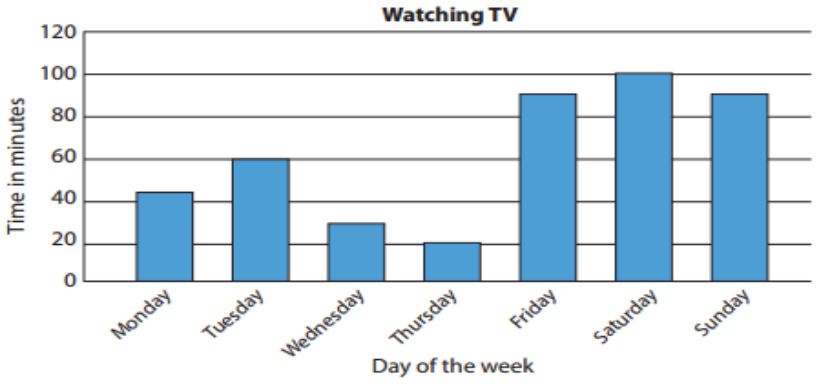
Class	Weekly awards for a tidy classroom (☺ = 3 awards)
Reception	☺☺☺☺
Year 1	☺☺☺ +1
Year 2	☺☺
Year 3	☺☺ +2
Year 4	☺
Year 5	☺
Year 6	☺☺ +1

Transfer the information from the weekly awards table to the table below.

Class	Number of awards
YR	
Y1	
Y2	6
Y3	
Y4	
Y5	
Y6	

Present the information in a bar graph.

The graph shows how many minutes Sam spent watching TV at home last week.



On which day did Sam watch the most TV?

How many minutes of TV did Sam watch on Wednesday?

How many more minutes did Sam watch on Friday than on Tuesday?

How many fewer minutes did Sam watch on Thursday compared to Sunday?

Notes:

Mastery with Greater Depth

Create two separate pictograms to display the following information. The symbol used in each should have a value of more than 1.

Which value will you choose for each pictogram?

Explain your decisions.

Class	Number of merits awarded	
	Hard work	Good behaviour
YR	42	32
Y1	39	18
Y2	24	27
Y3	30	33
Y4	18	24
Y5	30	24
Y6	39	36

Work with two friends to collect data on how many hours each of you watch TV for a week.

Decide how you will combine and present the data using just one graph.

Notes: