INSPIRE MATHS

Year 3 Home Activities

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Teacher Guidance

The *Inspire Maths* Home Activities provide opportunities for children to explore maths further outside the classroom. The engaging home activities help you to involve parents and carers in their child's mathematical learning. To support this, you might want to hold a short *Inspire Maths* meeting to fully explain what is expected.

Each Home Activity contains a practical activity to be completed using the activity sheets provided, or using common household items. A list of key words and phrases is given to support parents with modelling mathematical language for their children, and the activities also offer advice on specific strategies or misconceptions that parents could look out for.

Home Activities are only developed for units where home support is appropriate, so there may not be activities for all units. For those units without activities, you can refer to Home Maths sections in the *Inspire Maths* Pupil Textbooks for ideas for how a parent may support their child.

Parent/Carer Guidance

The *Inspire Maths* Home Activities give your child an opportunity to practise the maths that they have been doing at school, and give you an opportunity to support their learning.

Each Home Activity takes between ten and twenty minutes. The activities contain information on how the activity will help your child, important words and phrases that your child is learning, further opportunities to talk about your child's ideas, and particular strategies or issues to look out for. You are not expected to teach your child the mathematical concepts themselves.

You won't need any special equipment as most objects required for the activities can be found around the home. Some activities also include an activity sheet that contains illustrations or further questions to support your child's learning.

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1   Comparing Numbers to 10 000

This activity will help your child to compare numbers up to 10 000.

Important words and phrases:

- greater, greatest
- smaller, smallest
- thousand

You will need:

- digit cards cut out from Activity sheet 1
- place value chart from Activity sheet 1 – one for each player

What to do:

- Put the digit cards face-down and shuffle them.
- Each player takes four cards and turns them face-up. Ask: "*Who can make the greatest number with their cards?*"
- Each player rearranges their cards on the place value chart to make the greatest number they can. For example, 1, 3, 7 and 8 can be rearranged to make 8731. Make sure that your child has placed their digit cards in the correct column on the place value chart.
- Play several rounds, and then play to find the smallest number.
- When your child is confident, you can play a different variant of the game: each player takes four face-down cards. They turn three cards face-up. One card stays face-down. Ask: "*Who can make the greatest number with their three face-up cards?*" Show this number on the place value chart.
- Then ask: **"***Who do you think will be able to make the greatest number with all four of their cards?***"**
- Both players turn their fourth card over, and find out.

Talk about:

- Discuss whether you can ever be sure which player could make the greatest number with all four cards. You can arrange and rearrange the cards face-up to find the answer. If player A has a 9, and their next highest digit is greater than any digit player B has, player A will be able to make the highest number, whatever digits are on the face-down cards.
- There are only four of each digit – are there any other times you can be sure who will win?

Activity sheet 1

This activity sheet is for use with Y3 Home activity 1

Digit cards

1	1	1	1	2	2
2	2	3	3	3	3
4	4	4	4	5	5
5	5	6	6	6	6
7	7	7	7	8	8
8	8	9	9	9	9

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Place value charts

Thousands	Hundreds	Tens	Ones

Thousands	Hundreds	Tens	Ones

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4   Think of a Word Problem

This activity will help your child practise adding and subtracting up to 10 000 and relating the concepts to real life. Your child has been solving word problems in class – now they will make up their own.

Important words and phrases:

- add
- addition
- subtract
- subtraction
- word problem

You will need:

- Activity sheet 2
- a standard 6-sided dice

What to do:

- Ask your child to make two 4-digit numbers using the dice. To make each number, ask your child to roll the dice 4 times and write the digits in order.
- Next ask your child to roll the dice to choose a name and object from the boxes on Activity sheet 2. For example, if they roll a 1 and a 5 they should choose Ella and the ladybird.
- Ask your child to decide whether to make an addition problem or a subtraction problem. If they make a subtraction problem, they need to think carefully about the numbers they choose – make sure that they subtract the smaller number from the larger number.
- Encourage your child to use their numbers and words to make a problem, and work out the answer. They should write the answer down and hide it.
- When they have written down at least 2 problems (more if they are interested), your child can ask you or another person to solve them. Check their answers.

Talk about:

- Use everyday opportunities to think of problems with your child connected to what you are doing. For example, when you are in the car, look at the milometer. How many miles did it show when you had driven 2300 miles less?
- You could make up problems connected to things you see. For example, imagine there are 4356 ducks living along the canal, and 2341 fly away. How many will be left?

Activity sheet 2

This activity sheet is for use with Y3 Home activity 4

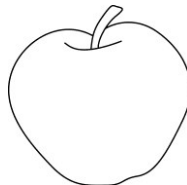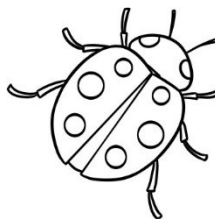|			
1.	Ella	**4.**	A shopkeeper
2.	Peter	**5.**	A farmer
3.	Ruby	**6.**	A king

1.
2.
3.
4.
5.
6.

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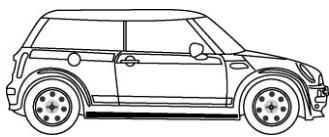
5   Multiplying by Grouping and Regrouping

This activity will help your child to practise their 6, 7, 8 and 9 times tables. It helps to introduce and strengthen some important ideas: how multiplication and division are related, that multiplication can be done in any order, and what particular pairs of numbers make, when multiplied together.

Important words and phrases:

* group
* tens, ones
* sixes, sevens, eights, nines
* divide
* equal groups
* multiply

You will need:

* at least 72 small objects (counters, beads, coins or pasta shapes)

What to do:

* Discuss the best way to count out 42 objects. Ask: *"How many tens do you need? How many ones do you need?"*
* Help your child to count out 42 objects, for example counters. You can arrange them in 4 rows of 10 (each row is two 5s, which can make the counting easier) and 2 spare counters. If your child suggests another way, you can use that instead.
* Now ask your child to arrange the 42 counters into groups of 6. Ask*: "How many groups of 6 are there? Are there any counters left over?"*
* Next ask how many groups of 7 there would be. Say*: "Arrange the counters into groups of 7. Were you right?"*
* Ask your child to suggest how to count out 48 counters. They will probably suggest 4 tens and 8 ones; if they suggest another way, you can use that instead. Ask: *"How many groups of 6 will there be? How many groups of 8? Check and see."*
* If you have enough objects, work with 56 (groups of 7 and 8), 54 (groups of 6 and 9), 63 (groups of 7 and 9) and 72 (groups of 8 and 9). Ask your child what groups they can make.
* Keep the discussion open. Your child might suggest some other groups (for example, 56 might be 14 groups of 4), but they will probably need you to suggest the groups*, for example: "There are 56 counters. How many groups of 7 can you make?"*

Talk about:

* Ask your child to use skip-counting, counting in 8s: 8, 16, 24, 32…
* Ask your child how you could use skip-counting to count a large number of objects. For example, "*Count the cars passing the house. Each time you have counted 8 cars, put up a finger. When you get to 10 fingers, how many cars have you counted? What would you get if you skip-counted in 8s? Do you know another way to work out 8 times 10?"*

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7 Division

This activity will help your child practise dividing numbers in a practical context. It also reinforces the link between multiplication and division.

Important words and phrases:

- divide
- equally
- group
- equal groups
- each
- left

You will need:

- 36 small objects (counters, beads, coins or pasta shapes)

What to do:

- Ask your child to count the 36 objects. Talk about how they count them – do they count each object separately, or do they group the objects in 2s, 5s or 10s?
- Ask your child to divide the objects into 3 equal groups. If it helps, you can suggest that one group is for you, one for your child, and one for a friend or sibling. Ask: *"How many counters are in each group? Are there any counters left over?"*
- Now ask your child to divide the counters into 4 equal groups and ask the same questions. Repeat the activity dividing into 5 equal groups. Ask: *"How many counters are in each group? Are there any counters left over? How many?"*
- Ask your child to suggest other groups to choose, and ask the same questions each time.
- Next ask your child to make groups of a particular size. For example, say: *"Now make groups of 12. How many groups do you think you will be able to make? Will any counters be left over?"*

Talk about:

Use everyday opportunities to practise dividing numbers. For example:

- o *"There are 24 rolls in this packet. How many could we each have if we had an equal number? How many would be left?"*

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8   Word Problems

Your child has been solving word problems using addition, subtraction, multiplication and division. In this activity, they will create their own problems.

Important words and phrases:

- add
- subtract
- multiply
- divide
- twice, three times, four times… as many
- altogether

You will need:

- Activity sheet 3

What to do:

- Look together at Model 1 on Activity sheet 3. Help your child to use this model to write a word problem. For example, ask "*Omar, Farha and Millie have 230 stickers altogether. Omar has twice as many stickers as Farha. Millie has 50 stickers. How many stickers does Omar have?*" Help your child to solve the word problem. To find the total number of stickers Omar and Farha have between them, subtract 50 from 230. This gives 180. To find the number of stickers Farha has, divide 180 by 3. This gives 60. Omar has twice as many stickers as Farha, so he has 120 stickers.
- Next ask your child to create more problems. Encourage them to draw their own model in the box on the activity sheet and to use their own numbers and words.
- Encourage your child to challenge someone else to solve the problems, and check their answers.

Talk about:

- Think of word problems with your child connected to what you are doing. For example, in the car look at the number on the milometer. *"A journey we often do is 20 miles. What number will the milometer show if you do that journey 7 times, starting now?"*
- Or make up imaginary problems connected to things you see. *"Imagine there are 3815 ducks living along the canal, and 8 fly away every day. How many will be left after 20 days? 25 more days?"*

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Activity sheet 3

This activity sheet is for use with Y3 Home activity 8

Omar	▓▓▓▓▓▓▓
Farha	☐
Millie	☐

230 stickers

50 stickers

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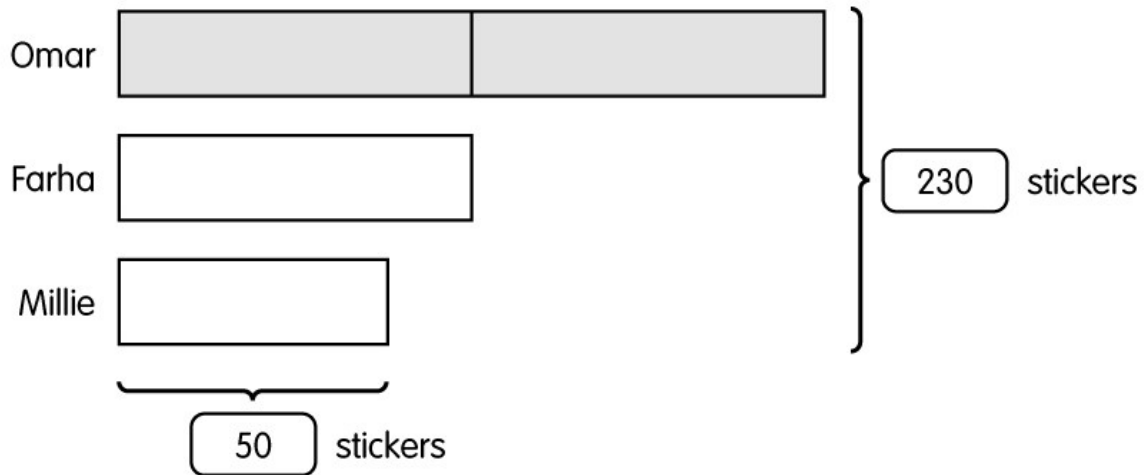
9 Mental Calculations

This activity will help your child practise adding, subtracting, multiplying and dividing mentally.

Important words and phrases:

- add, addition
- subtract, subtraction
- multiply, multiplication
- divide, division

You will need:

- paper and pencil

What to do:

- Together, think of a number between 11 and 99, for example, 47. Write it down.
- Now ask your child to think of another number between 11 and 99, and to write it down without showing you.
- Say: "*Now add your number to the one we both thought of. What is your answer?*"
- Tell your child you will now work out the number they thought of. For example, if the answer is 93, you will work out 93 – 47 = 46. Say: "*I think your number was 46. Is that right?*"
- Discuss with your child how you worked out the number they thought of.
- Now choose another number together, and this time you will think of a second secret number.
- Add the numbers and tell your child the total. Can your child work out your secret number?
- You can also play using multiplication: first, think of a number between 2 and 10 together. One of you then thinks of a secret number between 2 and 10, multiplies the two numbers together and gives the answer. The other person divides the answer by the first number to find the secret number.

Talk about:

- Use everyday opportunities to test your child's mental mathematics, for example adding up prices in shops, or making up questions connected to things that you see.
- Ask your child:
  - *"How many ways can you think of to add to numbers to make 40?"* (For example: 32 + 8, 1 + 39, 35 + 5…)
  - *"How many ways can you think of to add to numbers to make 100?"*

Look out for:

- Your child's mental maths will be stronger when they know their times tables well, but there are other number facts that can be useful. For example, pairs of numbers that add up to ten, and pairs of multiples of 10 that add up to 100 (e.g. 10 + 90; 20 + 80 and so on).

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10 Money and Prices

This activity will help your child practise adding and subtracting amounts of money.

Important words and phrases:

- regroup
- pound
- pence
- change
- total
- How much do …and …cost?

You will need:

- Activity sheet 4
- scissors
- various items to 'sell', such as food items, toys or clothes
- a £5, £10 or £20 note (optional)

What to do:

- Choose 5 or 6 objects to sell in an imaginary shop.
- If you can, have more than one of some of the objects. For example, the shop might have 4 tins of beans.
- Choose prices for the objects in pounds and pence. Discuss what a reasonable price for each object is.
- Make price labels for each item in the shop. You can use the labels on Activity sheet 4, or make your own.
- Now ask the total cost of different shopping lists. For example, ask: *"How much do 2 tins of beans cost? How much do 1 umbrella and 1 hat cost?"*
- Start by shopping for pairs of objects, but you can extend to longer shopping lists.
- Offer to pay with a £5, £10 or £20 note. How much change will you get?
- Help your child to use column addition and subtraction to answer the questions. Remind your child that sometimes they will need to regroup.

Talk about:

- Use everyday opportunities to practise adding and subtracting amounts of money. For example:

  o It's a good idea to know roughly how much some items of your shopping will cost before you get to the till. Ask your child to help you. Ask: *"How much will it cost for these apples and these oranges?"*
  o When paying for items using cash, ask your child to help you work out the change you will get.

- When you are in a shop, encourage your child to see that the prices often end with 99p. Discuss with your child how they would mentally calculate the price of a group of items with prices ending in 99p. Talk about how rounding up to the nearest pound makes these calculations easier.

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Activity sheet 4

This activity sheet is for use with Y3 Home activity 10

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11 Length and Distances

This activity will help your child think about the language of distance. At school they have learned that there are 1000 metres in a kilometre, and they will practise converting between the two.

Important words and phrases:

- distance
- how far
- farther, farthest
- closer, closest
- metre
- kilometre

You will need:

- a map of your local area (this can be found on the internet)

What to do:

- Use a map to find the route from your home to the homes of friends or family, or another landmark that is interesting to your child. Make sure you are looking at the distance in kilometres and not in miles.
- Your child should write down how far from home each person or landmark is.
- Ask your child: "*Who lives farthest away from us? Who lives closest?*"
- Ask some more questions, for example: "*How much farther away does Gran live than Pete? How many metres is that?*"
- Explain that the difference between how far away two people live from you is not the same as how far away from each other those two people live. Help your child to explain why.

Talk about:

- Talk about how far away other people or other destinations are, and talk about how long it would take to get there. For longer journeys, you could use mapping software and talk to your child about the route. Ask: "*Which route is longer? Which is shorter?*"
- Talk about how in the UK we use miles as a unit of measure for distances, but many countries use kilometres. Encourage them to look out for road signs to familiar destinations and notice that the numbers on the signs decrease as you get closer to your destination.

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12 Volume Word Problems

This activity will help your child practise using units of volume and revise some concepts of division. Your child has learned that 1 litre of water is the same as 1000 millilitres of water.

Important words and phrases:

- share
- each
- left
- litres
- millilitres
- volume

You will need:

- several glasses or cups of the same size
- a jug or a bottle with a known volume. For example, a measuring jug or an empty drinks bottle with a volume of 1, 2 or 2.5 litres.
- water

What to do:

- Fill a jug or bottle with water. Note the volume of water (e.g. 1, 2 or 2.5 litres).
- Agree a sensible level to fill the glasses to. Your child should pour the water from the jug or bottle into the glasses to this level. How many glasses can they fill?
- Share out the water that's left so that there is an exact number of glasses that can be filled.
- Help your child work out how much water is in each glass, using division. Remind them to start by converting the volume of the bottle into millilitres.
- Ask questions, for example:
  - *"How many jugs [or bottles] would you need to fill 10 glasses? Would there be any water left?"*
  - *"How many glasses could we fill with 2 jugs?"*
- You could practically check the answers to some of the questions.
- Ask your child to make up a question like those they have already considered, asking someone else to answer the question.

Talk about:

- Your child has also been learning about mass (in kilograms and grams) and length (in kilometres and metres).
- You could ask questions about mass and volume when you are shopping or cooking, for example: *"We need 100 grams of flour. How many grams are in the bag? How many times could we make this recipe using this bag?"* Encourage your child to look at packaging while shopping or cooking to support their understanding of mass and volume.
- You could ask questions about kilometres and metres when you are walking or travelling, for example: *"If it takes us half an hour to walk 1500 metres, how long will it take us to walk 6 kilometres?"*

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13 Reading Bar Graphs

This activity will help your child practise reading and interpreting bar graphs.

Important words and phrases:

- bar graph
- bar
- How many…?
- most, least

You will need:

- Activity sheet 5
- coloured pens or pencils

What to do:

- Look together at the bar graph on Activity sheet 5.
- Discuss what the graph shows.
- Choose a different colour for each bar and colour them. Talk with your child about the fact that this will make the graph easier to read.
- Talk about the questions on the activity sheet, and help your child to answer them.
- Ask your child if there is anything else they can tell you by looking at the graph.

Talk about:

- There are lots of bar graphs that you can see once you start looking. Ask your child to look out for them, for example in leaflets and adverts. Discuss what the bar graphs show.

Activity sheet 5

This activity sheet is for use with Y3 Home activity 13

Hours of TV pupils watched in I week
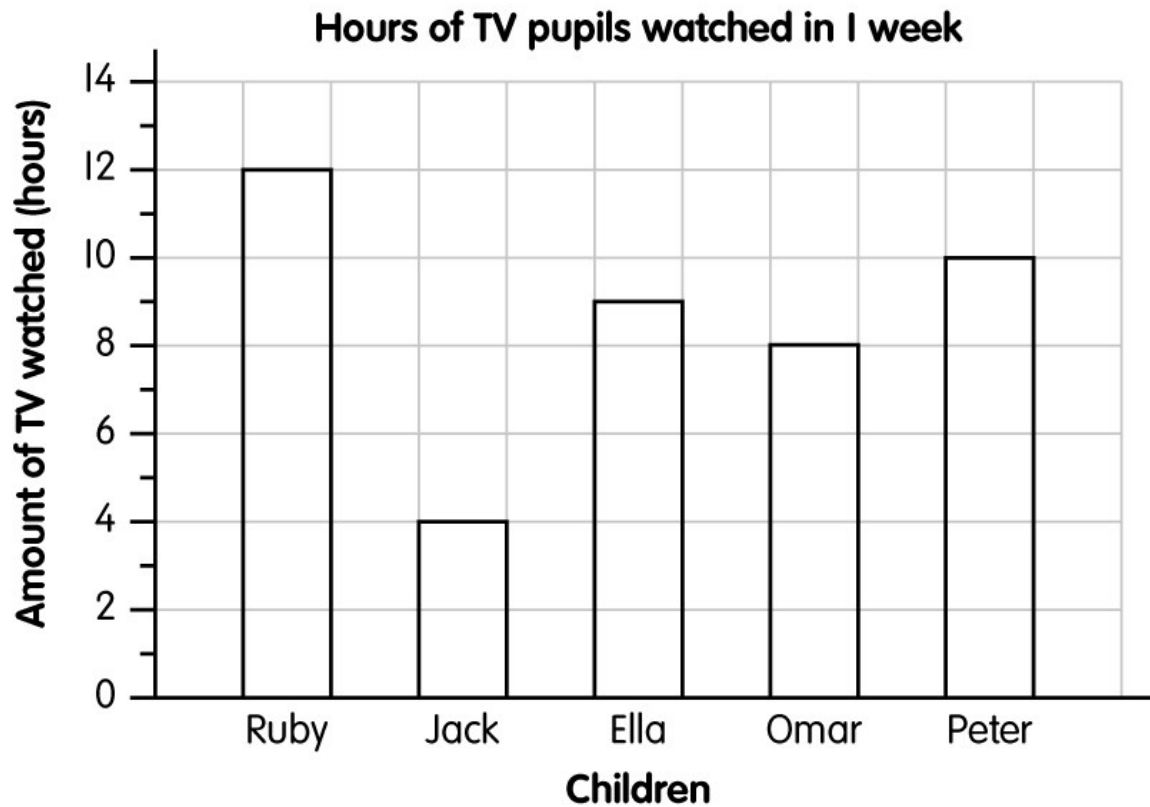
I Who watched the most television? _____

2 Who watched the least television? _____

3 How many hours of television did the children watch altogether? _____

4 Ella watched I more hour of television than someone else. Who? _____

5 I child watched twice as much television as another. Who are these 2 children?

_____ and _____

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14 Fraction Mysteries

This activity will help your child practise comparing, adding and subtracting equivalent fractions.

Important words and phrases:

- three-quarters
- one-half
- one-third
- twice as much
- three-eighths
- millilitres
- How many…?
- How much … left over?

You will need:

- Activity sheet 6

What to do:

- Together look through the word problems on Activity sheet 6. Your child needs to work out how many items are needed in each situation. They will need to think about equivalent fractions to do this. For example, $\frac{1}{2} = \frac{2}{4}$; $\frac{1}{2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$.

- The answers to the questions on the activity sheet are as follows:

    1. **a)** They need 2 cakes.

       b) $\frac{3}{4}$ of a cake will be left over.

    2. **a)** They need 2 pizzas.

       b) None will be left over.

    3. They drink 450ml of squash.

- You could ask your child to make up their own questions using fractions.

Talk about:

- There are lots of contexts where you can talk about fractions in everyday life, especially when you are sharing food. For example, ask: *"How many pizzas will we need if the children eat $\frac{1}{4}$ each and the adults eat $\frac{1}{2}$ each?"*

Activity sheet 6

This activity sheet is for use with Y3 Home activity 14

1 Peter eats $\frac{3}{4}$ of a cake and Ella eats $\frac{1}{2}$ a cake.

How many cakes do they need?

_____

How much cake will be left over?

_____

2 Ruby eats $\frac{1}{3}$ of a pizza and her mum and dad have half each. Ruby's brother has twice as much pizza as Ruby.

How many pizzas does the family need?

_____

How much pizza will be left over?

_____

3 Farha drinks $\frac{3}{4}$ of a glass of fruit squash and Peter drinks $\frac{3}{8}$ of a glass. Each glass is 400ml.
How many millilitres of squash do they drink?

_____

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15 Measuring Time

This activity will help your child practise reading the time in different formats, and calculating durations of time.

Important words and phrases:

- How long…?
- hours
- minutes
- o'clock
- past/to

You will need:

- Activity sheet 7

What to do:

- Look at Activity sheet 7. Discuss what is happening in each pair of pictures.
- Ask: *"Where is the clock? What time did they start? What time did they finish? How long did they take?"*
- Encourage your child to draw a timeline to help them work out how long each activity took.
- *The answers to the questions on the activity sheet are as follows:*

    1. The train journey lasted 43 minutes.

   2. It took the children 1 hour 8 minutes to build a snowman.

Talk about:

- Ask your child to work out what time an activity will finish, or how long an activity takes. Say, for example:
    o *"We'll stay at the pool for another half an hour. What time should we leave?"*
    o *"We got here at 17:20 and we'll stay until half past six. How long is that?"*

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Activity sheet 7

This activity sheet is for use with Y3 Home activity 15

How long did each activity take?

1

2

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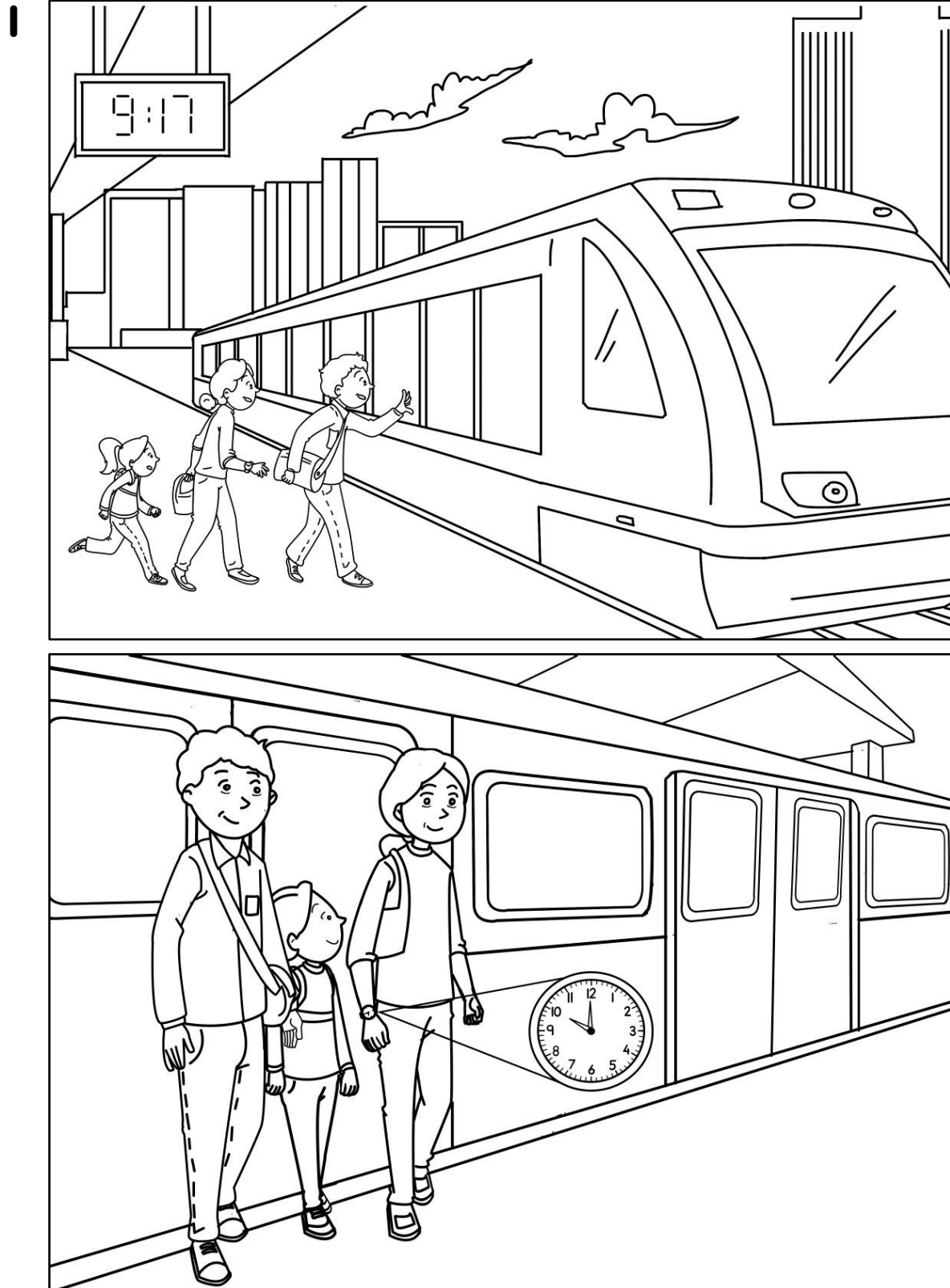
16 Angle Dot-to-dot

This activity will help your child identify angles, including whether an angle is a right angle, greater than a right angle or smaller than a right angle.

Important words and phrases:

* angle
* right angle
* equal to
* greater than
* smaller than

You will need:

* Activity sheet 8
* pencil
* ruler
* pen
* piece of paper

What to do:

* Ask your child to complete the dot-to-dot picture on Activity sheet 8 using a pencil. They should use a ruler to connect the dots.
* Now ask them to find angles in the picture, and mark each angle in pen, with a curve. (They should be looking for angles smaller than 180˚.)
  The curve should look like this:

* Ask your child which of the angles they have marked are equal to a right angle. To find out, they can use a right angle measurer: a piece of paper that has been folded in half, then in half again.
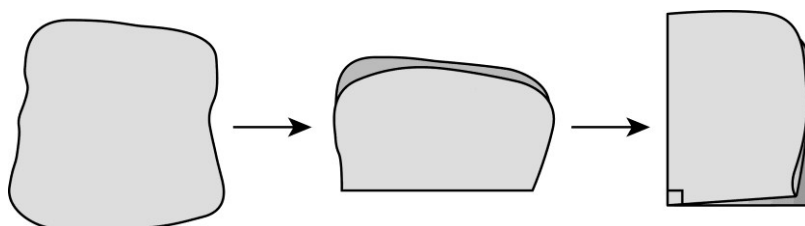
* Ask your child to use their right angle measurer to identify which of the other angles are greater than right angles and which are smaller.

Talk about:

* You can ask your child about angles you see around you. There are lots of right angles to find (on the corners of furniture and in the corners of rooms, for example). Can your child find any other angles?
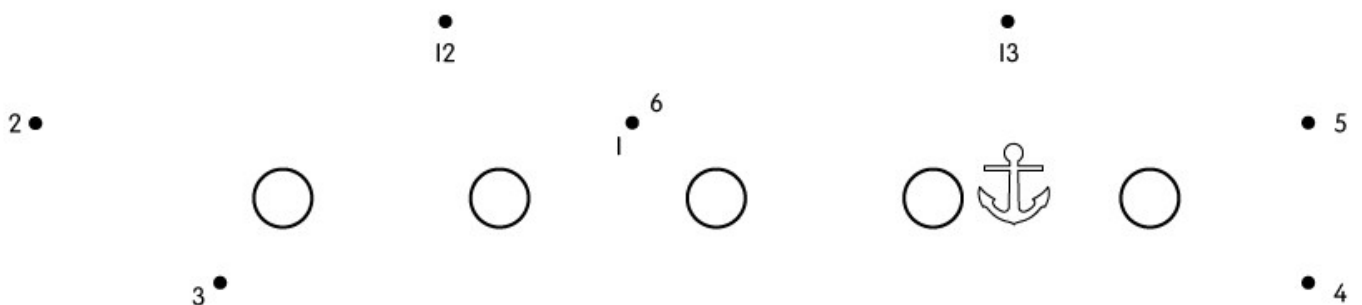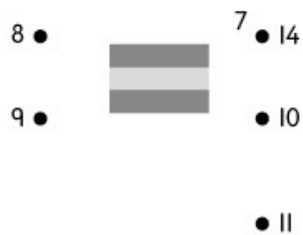
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Activity sheet 8

This activity sheet is for use with Y3 Home activity 16

Join the dots. Use a ruler!

How many angles are:

- equal to a right angle?
- greater than a right angle?
- smaller than a right angle?

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17 Perpendicular and Parallel Paths

This activity will help your child recognise parallel and perpendicular lines.

Important words and phrases:

- parallel
- perpendicular

You will need:

- Activity sheet 9

What to do:

- Look together at the maze on Activity sheet 9. Your child needs to match each starting point to an end point.
- To begin, they should follow the line from one of the starting points.
- Whenever they get to a **perpendicular** line, they must turn. Perpendicular lines are two straight lines that meet at a right angle. They can choose whether to go left or right. They **cannot** turn along a line which is not perpendicular. If they reach a dead end, they need to start again.
- Discuss how your child found their way through the maze each time.
- The rules said to follow the perpendicular lines. What did your child notice about which lines were parallel? Parallel lines are two straight lines that will never meet no matter how long you draw them.
- The paths from starting points A and B shared some lines. Do they always finish at different end points? Why?

Talk about:

- Look out for examples of parallel lines and perpendicular lines in real life. It can be useful to look in corners – for example, the line of the corner of a wall is perpendicular to the line between the floor and the wall. Ask: *"Why are these lines perpendicular? Why are railway tracks parallel?"*

Activity sheet 9

This activity sheet is for use with Y3 Home activity 17

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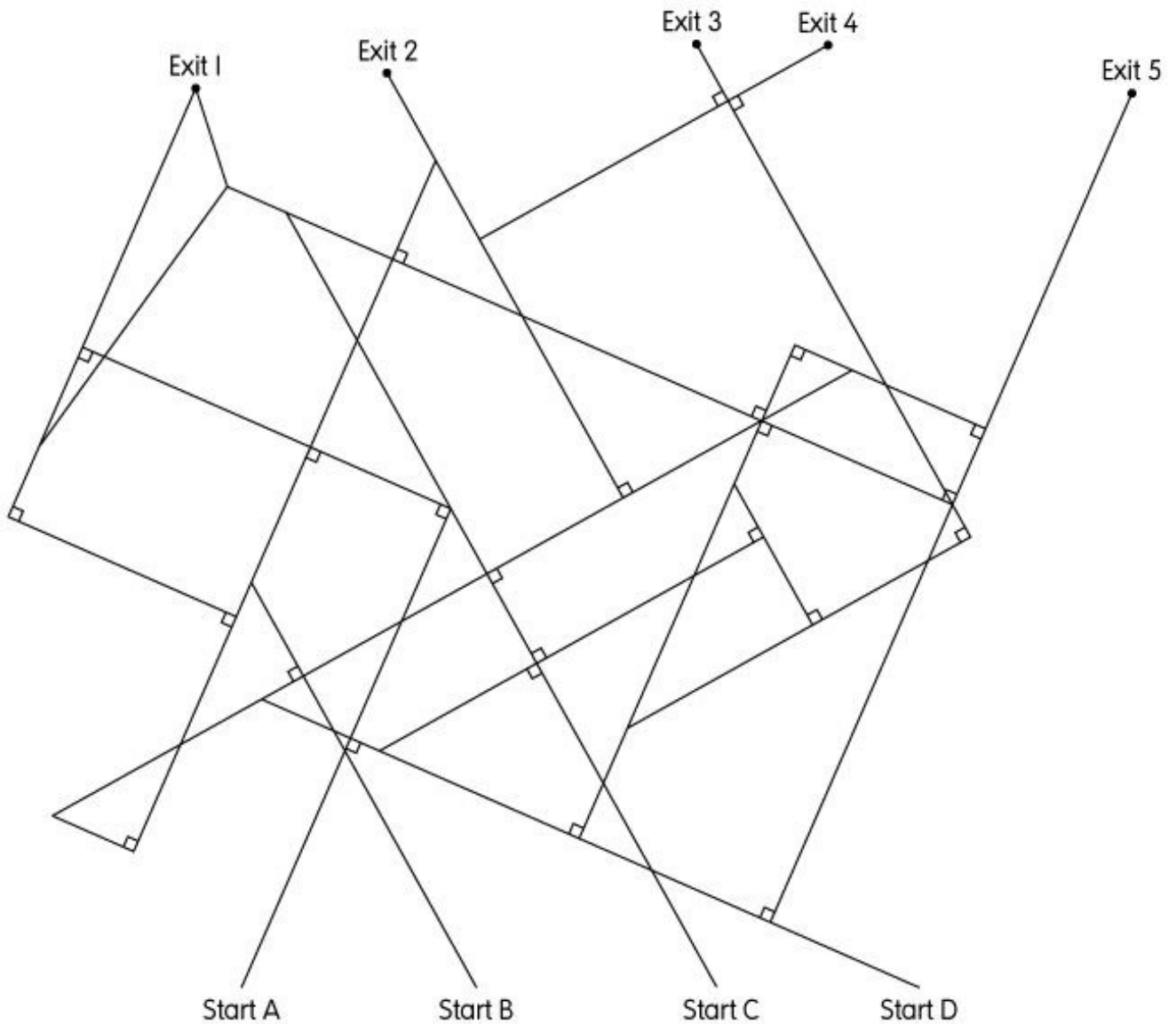
18 Small Perimeters

This activity will help your child practise calculating the perimeter of shapes, and understand how shapes with the same area can have different perimeters.

Important words and phrases:

- area
- perimeter
- centimetre
- square centimetre(s) (cm^2)

You will need:

- Activity sheet 10, cut into 36 squares
- scissors

What to do:

- Explain that each big square from Activity sheet 10 is made up of 4 smaller 1cm squares. Ask: *"What's the length of one big square?"* (2cm) *"What's the perimeter of one big square?"* (8cm). Remind your child that the perimeter of a 2D shape is the distance around it (the sum of its lengths). So the perimeter of one big square is 2 + 2 + 2 + 2 = 8 centimetres.
- Next ask your child to count the number of small squares inside one big square (4). *"How many 1cm squares are there in one big square?"* (4) Explain to your child that this is the area of the shape and it is written as 4cm^2.
- Ask your child to put 3 big squares in a row. Ask: *"What's the perimeter of this shape? What's the area? Is the perimeter and area larger than that of one big square?"*
- Encourage your child to arrange some or all of the squares in different shapes, and to calculate the perimeter and area of each shape.
- Ask your child to arrange all 36 squares to make different rectangles. 5 different rectangles are possible: 1 by 36, 2 by 18, 3 by 12, 4 by 9 and 6 by 6 (a square). You can help your child, but encourage them to find all of the rectangles themselves.
- Ask: *"Which rectangle has the smallest perimeter?"* Help your child to notice that the perimeter changes, but the area stays the same.

Talk about:

- You can measure the perimeter of objects at home; for example, the tabletop or the television. You can use a ruler or a measuring tape. Ask your child to estimate the answer before you measure the perimeter.

◎ INSPIRE MATHS

Activity sheet 10

This activity sheet is for use with Y3 Home activity 18

Cut along the dotted lines. Do not cut along the grey lines.