

Maths Games And Activities Pack

20 Fun Maths Challenges To Do At Home

Year 6

Note to Parents and Carers

Your child works hard during school and we know they deserve some rest and relaxation when they're at home. BUT... this pack is here to help you with some ideas of how to bring maths into your home in a fun way. The challenges are not intended to be too much like 'work'. They should provide just a bit of a mathematical focus every now and then.

The activities are separated into individual activities and partner activities. We understand that pupils are not always able to complete activities with others and as such hope this will help you and your child select appropriate activities to complete.

Individual activities

1 Multiplication and Division Mosaic

Your challenge:

- Can you use your multiplication and division skills to reveal the picture hidden in the grid?

How to play:

1. Work out the answer to the calculation in each square using your knowledge of the 1-12 times tables (including square and cubed numbers) and related division facts.
2. Colour in each square based on the key at the top of the sheet.

What picture will you reveal?

You will need:

- Challenge 1 Sheet
- Colouring pencils or felt tips

Challenge 1 Sheet Multiplication and Division Mosaic

Solve the questions in the squares below. Colour in the squares with the colours based on your answer. What picture will you make?

Blue: 4, 8, 18, 24, 40, 48

Red: 6, 16, 60, 64

Green: 0, 1, 2, 10, 12, 20, 21, 27

Purple: 3, 30, 36

Pink: 5, 25, 35, 72, 125

$?^2 = 4$	$10 \div ? = 2$	$9 \times 0 =$	3^3	$18 \div 9 =$	$7 \times ? = 70$	$? \div 5 = 5$	$? \div 5 = 2$
$12 \times 6 =$	$?^2 = 9$	$6 \times 1 =$	$20 \div 20 =$	$5 \times 4 =$	$6 \times 10 =$	$5 \times 6 =$	5^3
$? \div 3 = 12$	4^3	2^2	$8 \times 9 =$	$7 \times 5 =$	$? \times 1 = 8$	$? \div 8 = 2$	$27 \div ? = 9$
$8 \times 2 =$	$? \div 12 = 2$	$? \div 12 = 5$	$6 \times 3 =$	$? \div 10 = 4$	$30 \div 6 =$	$? \div 8 = 6$	8^2
$64 \div ? = 8$	$?^2 = 25$	$? \div 10 = 3$	$? \div 4 = 6$	$32 \div 8 =$	$? \div 8 = 8$	$2 \times 2 \times 2 =$	$9 \times 2 =$
$21 \div 7 =$	$?^2 = 16$	$8 \times 5 =$	4^2	$10 \times 3 =$	$?^3 = 64$	6^2	$54 \div ? = 9$
$100 \times 0 =$	$6 \times 4 =$	$48 \div 6 =$	$? \div 5 = 7$	$8 \times 6 =$	$?^2 = 36$	$? \div 8 = 5$	$? \div 12 = 1$
$3 \times 9 =$	$14 \div 14 =$	$?^3 = 125$	2^3	$45 \div 9 =$	5^2	$?^3 = 8$	$? \div 2 = 10$
$?^2 = 100$	$24 \div ? = 12$	$? \div 2 = 6$	$? \div 10 = 6$	$4 \times 12 =$	$10 \times ? = 100$	$? \div 3 = 7$	1^2
$2 \times 10 =$	$15 \times 0 =$	$? \div 5 = 4$	$3 \times 3 \times 3 =$	$1 \times 1 =$	$2 \times 2 \times ? = 8$	$? \times 1 = 12$	$8 \times ? = 0$

2 Mystery Times Tables

Your challenge:

- Can you help solve a times table mystery?
- On Challenge 2 Sheet there are two times tables that have been written in code. Each digit has been replaced by a letter and the times tables have all been jumbled up!

What to do:

1. Can you work out which digit each letter stands for? Try to spot patterns in the digits so you can rule out certain numbers and rule in others.
2. Can you work out which times table is the 11 times table or the 1 times table? Does the number of single digit answers help you work out which times table it could be?
3. Solve the puzzle and record which digit each letter stands for on the challenge sheet.

Set 1 times table (A) is _____

Set 2 times table (L) is _____

You will need:

- Challenge 2 Sheet

3 My Favourite Number

Your challenge:

- How much do you know about your favourite number?

What to do:

1. What's your favourite number? Write it down in the centre of a piece of plain paper (if you don't have a favourite number, pick a number at random).
2. Note down at least 20 facts about the number around your number, creating a poster. Examples you could choose include factors, multiples, even/odd, square number, sides on a shape etc.
3. For example, if your favourite number was 32, you could write down facts like:
 - It's a multiple of 1, 2, 4, 8 and 16
 - It's an even number
 - $32 \times 2 = 64$
 - $1 + 31 = 32$
4. Try to make sure you have a good range of different types of facts.
5. Be as creative as you can with how you present your work.

You will need:

- A piece of plain paper
- Colouring pencils or crayons

Challenge 2 Sheet Mystery Times Tables

These times tables are a mystery. Each digit has been replaced by a letter and the order of the times tables has been jumbled up!

Can you work out which digit each letter stands for? There are two sets of times tables for you to complete.

Try to spot patterns in the digits so you can rule out certain numbers and rule in others.

Can you work out which times table is the 11 times table or the 1 times table? Does the number of single digit answers help you work out which times table it could be?

Solve the puzzle and record which digit each letter stands for on the challenge sheet.

Times Tables Set 1

A = B = C = D = E =

F = G = H = J = K =

$$D \times A = A$$

$$H \times A = EJ$$

$$C \times A = EC$$

$$E \times A = JE$$

$$DB \times A = AB$$

$$J \times A = DJ$$

$$K \times A = GB$$

$$DJ \times A = HJ$$

$$F \times A = KE$$

$$A \times A = GA$$

$$G \times A = DC$$

$$DD \times A = AA$$

Times Tables Set 2

The letters and their digits are different to the first set!

$$L = \square \quad M = \square \quad N = \square \quad O = \square \quad P = \square$$

$$Q = \square \quad R = \square \quad S = \square \quad T = \square \quad U = \square$$

$$M \times L = L$$

$$P \times L = NU$$

$$N \times L = MU$$

$$L \times L = MS$$

$$T \times L = UP$$

$$S \times L = UL$$

$$O \times L = NS$$

$$MU \times L = LP$$

$$U \times L = P$$

$$MM \times L = LL$$

$$MQ \times L = LQ$$

$$R \times L = UQ$$

4 How many ways can you make...

Your challenge:

- How many ways can you find to make 3,210?

Things to remember:

1. Write 3,210 in the centre of a piece of plain paper.
2. Around the number, write at least 20 ways to make it.
3. For example:
 - $10^3 \times 3 + 200 + 10$
 - $(5 \times 1,000) - 1,790$
4. Try to make sure you have a good range of different types of facts.

You will need:

- A piece of plain paper

5 Shopping A-Round

Your challenge:

- Can you estimate the total cost of the food bill?

How to play:

1. Find an old receipt for some shopping (you may need to ask an adult for this). Don't look at the total!
2. Round each price to the nearest whole pound and find an estimated total. For example, if something costs £1.48 you'd round it to £1 and if something costs £1.76 you'd round it to £2.

My estimated (rounded) total for the shop was £ _____

The actual cost (before any coupons etc) was £ _____

The actual cost was £ _____ higher/lower than my rounded estimate.

You will need:

- A receipt
- A piece of plain paper

6 Product Hunt

Your challenge:

- How well do you know your numbers?

How to play:

1. You have the digits 6, 2, 7, 5, 0 and 3. You need to arrange them into a multiplication question like this: ThHTO x TO = ? For example, you could make $5,023 \times 67 = ?$
2. In each question, you can only use each digit once. Work out the answer to your calculation, using any method you like (don't use a calculator).
3. Make a list of the different products that you have made on Challenge 6 Sheet (remember, a product is the result of multiplication). How can you make sure you have found all the possible products? Fill in Challenge 6 Sheet to explain how you did this.

You will need:

- Challenge 6 Sheet

Challenge 6 Sheet Product Hunt!

You have the digits 6, 2, 7, 5, 0, 3.

You need to arrange them into a multiplication question like this: ThHTO x TO = ? For example, you could make $5,023 \times 67 = ?$ In each question, you can only use each digit once.

Work out the answer to your calculation using any method you like (don't use a calculator). Make a list of the different products that you have made (remember, the product is the result of a multiplication).

How can you make sure you have found all possible products?

The products I have found are: _____

Use this space below to help you.

I know I have found all the possible products because:

7 Proportion Hunting

Your challenge:

- Can you find the proportions all around us?

What to do:

1. On a plain piece of paper, write 'Proportions are all around us' in the middle.
2. Fill the rest of the paper with places you have seen fractions, decimals and percentages in real life (shopping sales, sharing a cake).

You will need:

- A plain piece of paper

8 Get Arty!

Your challenge:

- Your challenge is to create a piece of art that contains at least 6 obtuse angles, 4 acute angles and 5 right angles.

Things to remember:

1. You can create your artwork using any type of materials you like – you could create a collage, paint, colour or do anything else – it's up to you.

You will need:

- Plain paper
- Art materials

9 Areas and Perimeters

Your challenge:

- Can you estimate and measure area and perimeter accurately?

What to do:

1. Create a list of items you are going to find the areas and perimeters of (at least 20 in total). These could be large or small.
2. Next to each item, write an estimate of the area or perimeter.
3. Measure items and calculate the area or perimeter.
4. Compare your estimates to the real answers. How accurate were you?

You will need:

- A tape measure or ruler
- A piece of plain paper

10 How Much Screen Time?

Your challenge:

- Ever wondered how much time you spend on a 'screen' (such as watching TV or using a tablet or computer) over two days? Well, let's find out!

Things to remember:

1. Use Challenge 10 Sheet to record the start and end time whenever you have 'screen time'.
2. Work out the length of time you spent on the screen.
3. At the end of two days, add up the total amount of time. How many hours and minutes have you spent on a screen? Remember – there are 60 minutes in an hour.

I spent _____ minutes on a screen over 2 days.

This is the same as _____ hours and _____ minutes.

You will need:

- Challenge 10 Sheet
- A pencil or pen
- A clock or watch

Pair activities

11 Place Value Duel

Your challenge:

- Can you make a larger six-digit number than your partner?

How to play:

1. Get your digit cards ready. Cut them out from the Digit Cards Resource Sheet (at the back of this pack).
2. Shuffle all three sets of the digit cards. You and your partner must each draw six big lines on your sheet of paper like this:

3. Take it in turns to turn over a digit card and decide where in your number you are going to place the digit.
4. Put the digit in that position and tell your partner what value that digit has. For example, if you put a 3 in the tens column, you would say 'this 3 is worth 3 tens or thirty'.
5. Once you have placed a digit in your number, you can't move it! Therefore, it's important to think about the strategy you are using. Play at least seven rounds.

Who will be the champion?

I played with _____

The person who won was _____

You will need:

- Digit Cards Resource Sheet
- Two sheets of plain paper
- A partner

Challenge 10 Sheet How Much Screen Time?

Use this table to keep track of the 'screen time' you have over two days.

Day	Time started	Time ended	Duration

Total screen time over two days: _____

12 Multiplication Skirmish

Your challenge:

- Are you ready to have a multiplication skirmish?

How to play:

1. This game is simple, but addictive! Shuffle all three sets of digit cards from the Digit Cards Resource Sheet, then deal them between the two players.
2. At the same time, each player turns over one of their cards and puts it in the middle.
3. Race your partner to shout out the answer that you get when you multiply both the numbers together. For example, if you turned over an 8 and your partner turned over a 6, you'd have to shout out 48, because $8 \times 6 = 48$.
4. The person who shouts out the correct answer first gets to keep both cards. Keep playing until one player has run out of cards.
5. Play at least five rounds. Who will be the champion?

I played with _____

The person who won was _____

You will need:

- Digit Cards Resource Sheet
- A partner

13 Two-handed Maths, Paper, Scissors

Your challenge:

- Have you ever played 'Rock, Paper, Scissors'? Well this is a maths version of the same game!

How to play:

1. Stand and facing your partner. Make two fists and say together with your partner 'maths, paper, scissors' whilst moving your fists up and down (in a similar way to when playing rock, paper, scissors).
2. On scissors, each of you puts out between 0 and 10 fingers.
3. You then need to race to multiply the number of fingers you have put out by the number of fingers your partner put out (e.g. 6×8), double the answer (e.g. 48×2) and call out the answer (e.g. 96).
4. The player to call the correct answer first, wins a point.
5. Record who wins each 'battle' in a simple table; the first player to 15 points wins!

I played with _____

The person who won was _____

You will need:

- A partner

14 Tug of War

Your challenge:

- Why not play a maths version of Tug of War?

How to play:

1. Firstly, decide which player is going to 'add' and which player is going to 'subtract', then shuffle the digit cards into one pile. Write down the number 250,000 at the top of your piece of paper.
2. The player who is adding starts first. They turn over three cards and make them into a three-digit number (for example, 45,658). The player who is adding adds these to 250,000 (e.g. $250,000 + 45,658 = 295,658$). The result of this calculation is your new running total.
3. The player who is subtracting goes next. They turn over 5 digits, make it into a five-digit number and subtract it from the running total.
4. Keep playing in the same way, taking it in turns to make a number and add or subtract it. If the player who is adding gets 450,000 they win, and if the player who is 'subtract' gets the running total below 50,000 they win!

Who will win the tug of war?

I played with _____

The person who won was _____

You will need:

- Digit Cards Resource Sheet
- A partner
- Paper to keep a track of your score

15 Decimal Compare!

Your challenge:

- Are you ready for a fast-paced game with a partner?

How to play:

1. Cut up the cards from Challenge 15 Sheet. Shuffle them and deal them between both players.
2. At the same time turn over a card each. The player who has the largest value number has 5 seconds to collect the cards and add them to their pile – if they don't collect in time, then the other player gets the cards.
3. The person who gets all the cards first wins!

Play the game at least twice – can you win both times?

The first time I played, I played against _____

and the person who won was _____

The second time I played, I played against _____

and the person who won was _____

You will need:

- The cards from Challenge Sheet 15
- A partner to play with

Challenge 15 Sheet Decimal Compare!

0.43

0.34

0.44

0.67

0.76

0.68

0.69

0.96

0.45

0.54

0.53

0.52

0.70

0.3

0.4

0.5

0.23

0.32

0.31

0.1

0.98

0.89

0.99

0.97

0.79

1.43

1.01

0.01

0.05

0.09

0.9

0.17

0.71

0.81

0.18

0.77

16 Trolls and Giants

Your challenge:

- Who will win in the battle between troll and giant?

How to play:

1. Sit opposite your partner and decide who will be the troll and who will be the giant.
2. Place the grid from Challenge 16 Sheet in between you. The aim of the game is for the troll to make it to the giant's home on the other side of the grid. The giant's aim is to stop the troll from getting there by ending up on the same hexagon on the grid as the troll.
3. The troll goes first. Place your counter on one of the hexagons on the 'troll's home' side of the paper and carry out the calculation in the hexagon. If the calculation is correct (your partner needs to check and agree) you get to move to that hexagon.
4. The giant starts in the same way from the 'giant's home' side of the paper.
5. On the next turn, each player can move to one of the hexagons joint to the hexagon they are on. If they get the answer correct, they move to that hexagon; if they don't get it correct, they stay as they are!
6. Have a think about your strategy – where will you move next? Try to play the game at least two times.

You will need:

- Challenge 16 Sheet
- A partner
- A counter each (you could make your own out of paper)
- Plain paper for any working out

The first time I played, I played against _____

and the person who won was _____

The second time I played, I played against _____

and the person who won was _____

Challenge 16 Sheet Trolls vs Giants

Troll's House

A hexagonal grid containing 49 math problems. The problems are arranged in a honeycomb pattern, with each hexagon containing a single math problem. The problems are as follows:

- Row 1: $5.32 \times 2 =$, $82,000 - 7,502 =$, $15.32 \times 5 =$, $8,147 \times 23 =$, $8,420 \div 20 =$, $535 - 5^2 =$, $12 \times 28 =$
- Row 2: $(2 \times 8) + 6 =$, $1,234 \times 26 =$, $7^2 =$, $55 \times 1,820 =$, $(36 \times 3) - 15 =$, $10^3 =$, $5,037 \times 15 =$
- Row 3: $1.53 \times 100 =$, $105,631 + 132,906 =$, $22.1 \times 5 =$, $2,120 \times 4 =$, $4^3 =$, $302 \div 100 =$, $84.32 \times 10 =$
- Row 4: $(3 \times 100) \div 5 =$, $2^3 + 9 =$, $91.3 \times 6 =$, $227,791 - 43,222 =$, $8.21 + 22.4 =$, $250,008 + 65,260 =$, $3.201 + 3.55 =$
- Row 5: $104 \div 100 =$, $6,528 \div 51 =$, $10^3 =$, $89 \div 100 =$, $3,120 \div 5 =$, $(23 \times 4) - 16 =$, $4,571 \times 32 =$
- Row 6: $3,100 \div 25 =$, $(90 \div 5) \times 2 =$, $1.771 + 5.01 =$, $6.36 - 1.307 =$, $223.4 + 0.321 =$, $8.642 - 5.21 =$, $1.34 \times 1,000 =$
- Row 7: $5^2 =$, $5,120 \times 9 =$, $4,575 \div 25 =$, $32.1 \times 3 =$, $4,105 \times 5 =$, $5.52 \times 10 =$, $3^3 =$
- Row 8: $3.62 \div 10 =$, $54.1 - 2.3 =$, $12 \times 5,234 =$, $15 \times 34 =$, $(1 \times 8) + 7 =$, $3,588 \div 23 =$, $5^2 + 21 =$

Giant's House

17 Proportion Snap

Your challenge:

- Let's play a game of snap, but with a maths twist.

How to play:

- Shuffle the cards from Challenge 17 Sheet and deal them between the players.
- Play just like you would do in 'normal' snap – take it in turns to turn over one of your cards and place it in the middle.
- If the two cards are equivalent the first person to call 'snap' and place their hands on the pile of cards wins the cards. Remember, equivalent means they are worth the same.
- The first player to get all of the cards wins! Try to play the game at least twice.

The first time I played, I played against _____

and the person who won was _____

The second time I played, I played against _____

and the person who won was _____

You will need:

- The cards from Challenge 17 Sheet cut up
- At least one other person

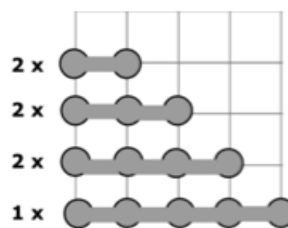
18 Battleships!

Your challenge:

- Let's play a classic game of battleships – but with a coordinates twist!

How to play:

- First, plot the 'ships' shown below on your grid. Make sure you hide them, so they are difficult for your partner to find.
- Then, take it in turns to guess where your partner's ships are hidden. To do this, you need to read out the co-ordinates – remember, you read out the horizontal axis value first, and then the vertical axis value.
- Your partner will then tell you if you have 'hit' one of their ships or not. Keep track of your hits and misses on your map (use a coloured pencil). If you get a 'hit' you get another go, if not, it's your partner's turn to guess.
- Who can find all of their partner's battleships first?



You will need:

- Two copies of Challenge 18 Sheet
- A partner
- Two pencils
- Two coloured pencils

I played with _____

The person who won was _____

Challenge 16 Sheet Proportion Snap

$\frac{1}{2}$	0.25	$\frac{2}{4}$	$\frac{1}{2}$	$\frac{4}{8}$
0.75	$\frac{3}{4}$	$\frac{5}{10}$	$\frac{1}{3}$	$\frac{6}{8}$
$\frac{1}{5}$	0.5	$\frac{2}{6}$	$\frac{9}{12}$	$\frac{3}{9}$
$\frac{5}{15}$	$\frac{2}{10}$	0.75	$\frac{3}{5}$	$\frac{25}{100}$
$\frac{1}{5}$	$\frac{1}{5}$	$\frac{2}{5}$	$\frac{2}{5}$	$\frac{4}{5}$

$$\frac{4}{5}$$

$$\frac{3}{15}$$

$$\frac{2}{5}$$

40%

$$\frac{6}{10}$$

$$\frac{4}{20}$$

$$\frac{9}{15}$$

$$\frac{30}{50}$$

$$\frac{5}{6}$$

$$\frac{50}{100}$$

$$\frac{4}{10}$$

$$\frac{1}{7}$$

$$\frac{3}{21}$$

0.5

0.25

0.75

$$\frac{8}{10}$$

$$\frac{16}{20}$$

$$\frac{80}{100}$$

50%

$$\frac{50}{100}$$

$$\frac{5}{10}$$

0.2

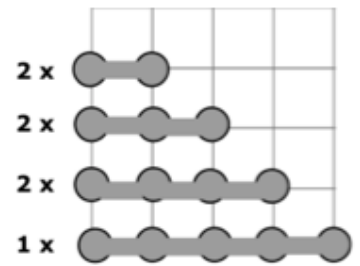
0.4

0.8

Challenge 18 Sheet Battleships

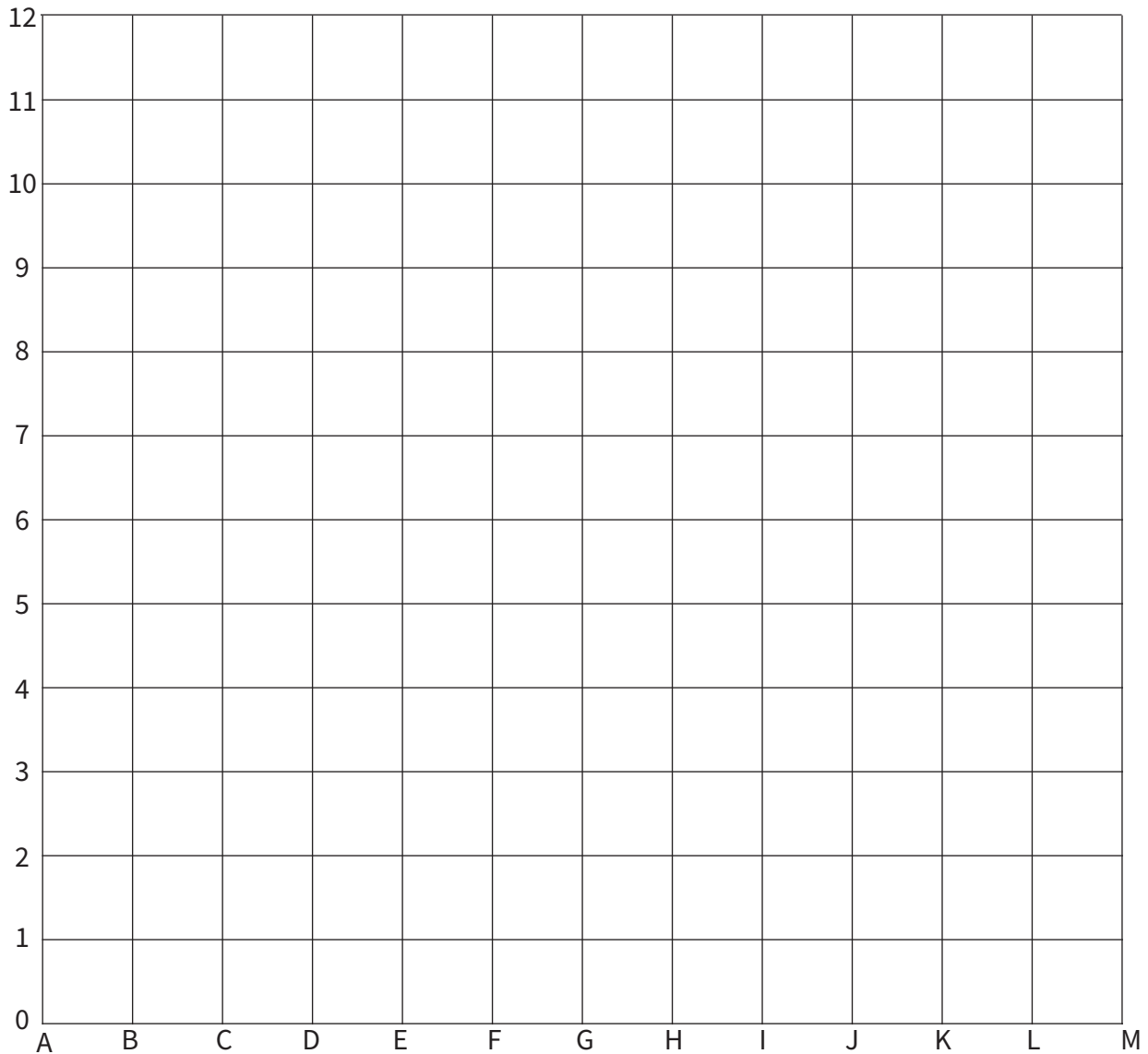
Let's play a game of co-ordinate battleships.

See the challenge list for the full instructions.



Here are the boats you need to put on your grid. Remember, your boats are made up of points not squares.

My Map



19 The Great Maths Bake Off

Your challenge:

- Bake something tasty and find the hidden maths.

What to do:

1. Cooking is so much fun! But did you know it involves a lot of amazing maths too?
2. Work with an adult to bake something yummy. Need an idea of some recipes? Head to bit.ly/TSLrecipes to get some ideas. Have fun in the kitchen, and then fill in the details below. What did you make, and what maths skills did you think you used!?

I made _____

The maths I used was _____

You will need:

- A recipe for something yummy
- Ingredients
- An adult to help you

20 Who Creates the Most Washing Up

Your challenge:

- Can you find out who creates the most washing up in your house?

Things to remember:

1. This activity involves helping out with the washing up for a week. People at home generate a LOT of dirty dishes. But who in your house generates the most?
2. Before you begin, predict who you think will create the most washing up over the next week.
3. I think that the following person will make the most washing:

4. Over the next week, use Challenge 20 Sheet to record your results. In the table, record how many items of washing up each person in your house generates in the table. Think about how you can record this data – will you use a tally?
5. Next, create a bar graph of your results.
6. Then, write down five things you can tell from the data on your Challenge 20 Sheet. For example, who creates the least washing up? Who creates the most?
7. The person who created the most washing was

You will need:

- Challenge 20 Sheet

Challenge 20 Sheet Who creates the most washing up?

A. Use the table below to help you record your data.

Family member's name	Mon	Tues	Wed	Thur	Fri	Sat	Sun	Total

B. Make a bar chart of your results for each person's totals

Put your results for the total amount of washing up made into a bar chart. Remember to think about the scale you are going to use for your vertical axis and to give the chart a title.

Bar Chart Title: _____

C. Now, use the lines below to write at least five things that you can tell from your data.

Resource Sheet 1

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

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