Look back

Your child is revising some of the work done in 4th Class: the numbers 0–9,999; addition and subtraction of numbers with totals to 9,999; fractions – halves, quarters, eighths and tenths; recognise and name the 2-D shapes, square, rectangle, triangle (isosceles, equilateral and scalene), semi-circle, rhombus, pentagon and hexagon; recognise and name the 2-D shapes that tessellate; recognise and name the 3-D shapes, pyramid (different bases), sphere, cylinder, cone and different prisms; recognise the nets of 3-D shapes; tens and units to 9,999; performing simple shopping activities with totals to €49.99 and reading the time in one hour, half-hour, quarter-hour and 5-minute intervals in both analogue and digital forms. Your child needs to know the mathematical language associated with the numerals 0–9,999: how many?, write the numeral/number, colour, count, ring, row, and, make, plus, equals, more, less, is the same as, add, subtract, take away, multiply, divide, past, before, half past, quarter past/to.

Here are a few ideas that may be of help to get your child on the road to enjoying mathematics.

3-D shapes

Ask your child to find something around the house/local environment in the shape of a cone (funnel, ice cream/traffic cone), sphere (ball), cylinder (tins of beans, peas, etc.), cube (Oxo, ice, dice), cuboid (shoebox, cereal box), triangular prism (Toblerone box) or square pyramid (candle, tent, paper weight). Talk to him/her about the number of faces, vertices (corners) or edges that are on each shape.

2-D shapes

It must be emphasised that 2-D shapes cannot be held. They are only pictures/symbols – they don't have any depth. Encourage your child to make a 2-D shape by drawing around a side of its corresponding 3-D shape, e.g. place a cube on a piece of A4 paper. Draw/trace around the side and s/he will be left with a square. Ask your child to find something around the house or local environment in the shape of the 2-D shapes square, rectangle, triangle (isosceles, equilateral and scalene), semi-circle, rhombus, pentagon and hexagon, e.g. face of a clock, window pane, panel in a door, calendar, pencil top, football net, saucers, candles, etc.

Money: Coins up to €2 and notes to €20

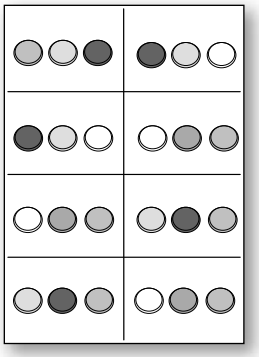
Ask your child to empty his/her piggy bank of any coins (if s/he has one). Ask him/her to count the value of the coins and to arrange all the money into euro and cent. You could also place a handful of coins on the table and ask your child to place the coins in piles before counting each denomination of coin, i.e. all the 5c coins together, 10c coins together, etc. You could also use Monopoly money or real money to make *target amounts*, for example:

€8·56 = €5 + €2 + €1 + 50c + 5c + 1c.

€28·05 = €20 + €5 + €2 + €1 + 5c.

€35·29 = €20 + €10 + €5 + 20c + 5c + 2c + 2c.

Fractions: Sharing



Give your child an A4 sheet of paper. Ask him/her to fold the sheet in half and then into quarters and finally into eighths.

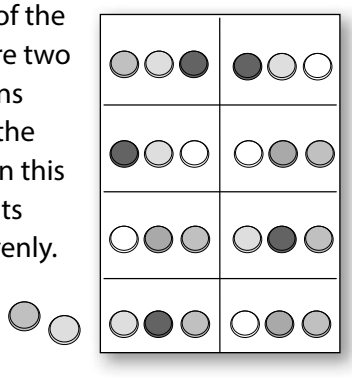
Show him/her that s/he can find one eighth ($^1/_8$) of a number by sharing the cubes/counters/1c coins equally, e.g. 'Find $^1/_8$ of 24'. First, ask your child to count out 24 cubes. Next, ask him/her to share the 24 cubes equally among the eight equal sections on the A4 sheet of paper and ask:

- *How many cubes are in the first part/section of the sheet?*
- *How many cubes are in the second part/section of the sheet?* Continue in this manner.
- *Did you share the cubes equally?*
- *So, what is one eighth of 24?*

You can invite your child to share other amounts, such as 32, 40, 48, 56, etc.

Fractions: Sharing with remainders

Using the same sheet as above, ask your child to share 26 counters/cubes/1c coins or anything that you have to hand among the eight sections. S/he should come to the understanding that there are 3 counters/cubes/1c coins on each section of the sheet and that there are two counters/cubes/1c coins left over. This is called the 'remainder'. Continue in this way with other amounts that can't be shared evenly.



Place value to 99,999

Your child will be learning about place value involving ten thousands, thousands, hundreds, tens and units over the coming days. S/he needs to know the mathematical language associated with place value: ten thousands, thousands, hundreds, tens, units, count forwards, count backwards, ten thousands house, thousands house, hundreds house, tens house, units house, swap, exchange, add, show most, show least, less than, more than, even number, odd number, digits, greater than.

Game 1: Clap, tap

Invite your child to count in ten thousands from different starting points between 0 and 99,999, e.g. 10,000/20,000/30,000/40,000/50,000, etc. or 4,635/14,635/24,635/34,635/44,635, etc. As s/he says each ten thousand, your child alternates an action, for example, 10,246 (clap hands), 20,246 (tap feet), 30,246 (clap hands), 40,246 (tap feet), 50,246 (clap hands), 60,246 (tap feet), etc.

Variation: Invite your child to count backwards from different starting numbers also.

Game 2: Calculator fun

Invite your child to enter 10,000 + into his/her calculator. If s/he keeps pressing the equals sign, the display on the calculator will count up in ten thousands.

Variation: Press 99,995 – 10,000 and continue pressing =. The calculator will display counting back in ten thousands from 99,995.

Game 3: Mystery number

Thinks of any number between 0 and 99,999. Your child must now ask questions in order to find out the number, but you can only reply giving 'Yes' or 'No' as the answer. Your child must ask at least three questions before s/he can guess what the mystery number is, for example:

- *Is it less than 23,456?*
- *Is it an even/prime/composite/square/ triangular number?*
- *Does it have more than 7 ten thousands/4 thousands/ 3 hundreds/2 tens/9 units?*
- *Is the thousands digit greater than the units digit?*
- *Is the hundreds digit greater than the ten thousands digit?*

Now invite your child to think of a mystery number and you try to guess what number it is!

Note: You may prefer to allow your child to ask up to five or even six questions.

Game 4: Playing cards lotto

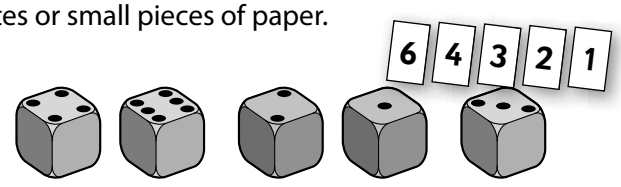
Materials required: Deck of cards (only use cards 1–9, ace card = 1), cubes or counters

This game requires at least two players. Each player gets a pile of nine cards. The players are not allowed look at the cards. Player A takes the top four cards from his/her pile and turns them face-up on the table. S/he arranges the four cards to make the biggest number possible. S/he calls out the number s/he has made, for example, if Player A turns over a 5, 2, 7 and 1 (ace), the biggest number s/he can make is 7,521. Player B may turn over a 4, 8, 9 and 6. The biggest number s/he can make is 9,864. Whichever player is showing the bigger of the two numbers wins a point and is given a cube or counter. In this game, Player B wins the cube as 9,864 is bigger than 7,521. Each player turns over the remaining five cards to make the biggest number possible and again whichever child is showing the bigger number wins a cube. Shuffle all the cards again and each player is given nine new cards to continue the game as above. Play continues until a certain number of rounds are completed. Whichever player has the most cubes/ counters at the end of the game is the winner.

Game 5: Dice lotto

Materials required: Five dice, digit cards 1–9, cubes or counters

This game requires at least two players. Player A rolls the five dice and makes the biggest number possible using all five digits. S/he can use digit cards to make that number. You can make digit cards using Post-it notes or small pieces of paper.



Player B takes his/her turn to make the biggest possible number with the five dice. Player B also uses digit cards to make that number. Whichever player's number is the bigger of the two numbers wins a cube/counter. Play continues as above until one child wins 5/10 cubes.

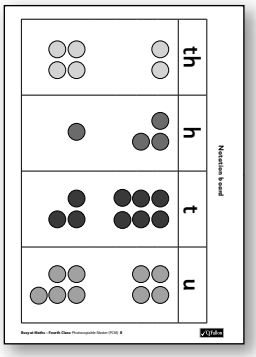
Extension: Instead of making the biggest number possible, the players must make the smallest number possible and hence win a cube for the smaller number of the two players.

Addition strategies

Your child will be learning about addition and estimation strategies – clustering strategy, special numbers strategy and the rounding strategy. They will learn to round numbers to the nearest 10, 100 and 1,000. They will solve problems and be required to always estimate the answer to problems before doing any calculation by using the most appropriate strategy. Your child needs to know the mathematical language associated with addition and estimation strategies: mental strategy, round up/down, nearest thousand/hundred/ten, more than, less than, strategy, between, estimate, add, addition, subtraction, difference, take away, minus, total number, clustering strategy, calculate, special numbers strategy.

Addition strategy A

Materials required: Any base ten materials that you have to hand – blocks, counters, real or fake money (Monopoly), etc., notation board.



Pose the following problem to your child: *A builder used 2,364 nails while building a house one day and 4,135 nails the next day. Find the total number of nails used over the two days.*

First of all, ask your child to give an estimate of what s/he thinks the answer will be. Now invite him/her to make 2,364 using base ten materials on his/her notation board (see picture). Now invite him/her to also make 4,135 on his/her notation board using base ten materials. Ask your child the number of units they have altogether. Similarly, ask him/her to count the number of tens/hundreds/thousands. Therefore, what is 2,364 plus 4,135 altogether? (6,499)

Addition strategy B

Materials required: Base ten materials, e.g. blocks or money, notation board as above

Invite your child to solve the following problem: *Kiwi App Store developed 3,425 apps one month. They developed 5,173 apps the next month. What was the total amount of apps developed over the two months?*

Invite your child to represent the 3,425 apps using base ten materials on his/her notation board. Ask him/her to break up the second number 5,173. First of all, add 5,000 to the notation board.

Say to your child:

- *How many apps have we now? Yes, 8,425.*
- *Now add 100 more apps.*
- *How many have we now? Yes, 8,525.*
- *Next add 70 more.*
- *How many have we at this point? Yes, 8,595.*
- *Finally, add 3 more units.*
- *How many have we altogether? Yes, 8,598.*

Clustering strategy

Display the following numbers: 88, 90, 91, 93. Tell your child that these numbers represent the number of bicycles sold in four different shops in a week. Estimate how many bicycles were sold altogether that week between the four shops. Ask your child to suggest which of the following two numbers the four original numbers centre around: 80 or 90? The answer is 90. Therefore, we can multiply 90 x 4 to get an estimate of 360.

Extension: Proceed as above using other examples involving hundreds and thousands.

Rounding strategy

Rounding definition: To round numbers means to change the numbers to the nearest ten, hundred or thousand so as to make them easier to work with mentally.

Round down, round up

Invite your child to begin counting from 1 to 4 and remain seated, when s/he reaches 5, s/he must stand up and say 5, 6, 7, 8, 9, 10. S/he sits down as s/he counts from 11–14 and again will stand while counting from 15–20. Continue counting in this manner. (The idea that s/he sits down for numbers 1–4 is that we round down for these numbers and the reason s/he stands up for numbers 5–9 is that we round up for these numbers.)

Extension: Count from 110 to 120 similarly. Now count from 1,230 to 1,240, etc.

More than or less than

Give your child various addition problems within 9,999. Invite him/her to estimate (by rounding) if the answer to the problem is more or less than a given number, for example:

247 + 381 = ? *Is it more or less than* 500*?*
3,267 + 1,458 = ? *Is it more or less than* 3,000*?*

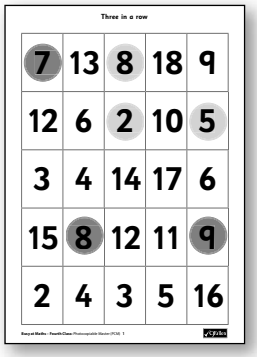
Your child will be learning about adding five-digit numbers with and without regrouping (swapping ten units for a ten and/or swapping ten tens for a hundred, swapping ten hundreds for 1,000 and/or swapping ten thousands for 10,000). Your child needs to know the mathematical language associated with addition: and, add, addition, altogether, plus, together, total, increase, row, column, vertically, horizontally, diagonally, counting on, ten thousands, thousands, hundreds, tens, units, digit value, more, less, swap, regroup, digit, total amount, maximum.

Your child will also be learning about subtracting five-digit numbers with and without renaming (renaming a ten as 10 units, a hundred as ten tens, a thousand as ten hundreds and/or a ten thousand as ten 1,000). S/he needs to know the mathematical language associated with subtraction: rename, fewer, subtract, difference, how many more?, how much less, minimum, swap, thousands, hundreds, tens, units, combined, biggest, smaller, compare, take, number sentences, subtraction, take away, estimate, columns, value of the digits, subtraction houses, leaves, equals.

Note: The following games allow your child to do addition and subtraction in a playful way. They prepare him/her for working with bigger numbers later on.

Game 1: 3 in a row

Materials required: 3 in a row board, three different-coloured 6-sided dice, two different-coloured sets of counters (10 of each colour)



Make a 3 in a row board – draw 25 boxes (five rows of five) on a piece of A4 paper and write a number from 3–18 in each box. A number can only be repeated once. Repeated numbers cannot be beside each other. Invite your child to roll the three dice. S/he must add the three numbers shown. For example, if s/he throws a 4, 6 and 2, s/he adds the numbers to get a total of 12. S/he puts one of his/her red counters on one of the number twelves on the 3 in a row board. You take your turn rolling the dice, adding to get the total and placing one of your green counters on the corresponding number on the 3 in a row board. Play continues like this until one of the players connects 3 of his/her counters in a row vertically, horizontally or diagonally. That player is the winner.

Variation: You can deal with bigger totals/numbers by using four dice instead of three.

Game 2: Addition using playing cards

Materials required: Deck of cards (only use cards 1–10, ace card = 1), counters or cubes

Give each player 12 cards. They keep their cards in a pile face-down on the table. Your child turns over the top three cards and adds the three numbers together. For example, if your child turns over a 7, 2 and 9, s/he adds them together to get 18. Then you do the same. Compare the totals. Whichever player is showing the bigger total wins a counter or cube. Play continues like this until all the cards are turned over. Whoever has the most counters/cubes at the end of the game is the winner.

Variation: Add four cards together instead of three.

Subtraction: Turn two cards over at a time and this time subtract the smaller number from the larger number, and continue as outlined above for addition.

Game 3: Calculator challenge

Ask your child to enter a number on the calculator between 0–9, for example, 7. Then ask him/her to add another number to the 7, for example 6, but before s/he presses the = sign, s/he must try to work out what the answer is. S/he continues in this manner adding 6 each time to the previous answer and working out what the next answer will be before pressing the = sign on the calculator. The challenge is to see how far s/he can get without making a mistake.

Variation: Do the same for subtraction.

Count up

Materials required: Three different-coloured dice (ideally nine-sided), pencil, sheet of A4 paper

Invite your child to throw the three dice and add the totals shown, e.g. if your child throws a 4, 6 and 5, s/he gets 15. The 15 is then written under your child's name on the piece of paper. Similarly, you take your turn, e.g. you throw a 5, 3 and 4 which totals 12. The 12 is written under your name in the second column. Play continues like this until a player reaches a target number, e.g. 50, 100, etc. S/he is the winner.

Child's Name	Adult's Name
15	12

Data 1 – Averages

Your child will be learning about averages over the coming days. Averages are introduced formally for the first time in 5th Class, so it is a new mathematical concept for your child. Your child needs to know some of the language associated with averages: total, divide, about, represented, altogether, above/below average, estimate, most/least, middle, identical.

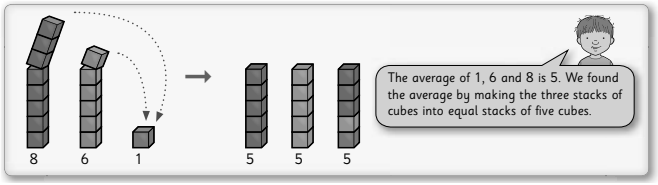
What does 'average' mean?

It is likely that your child has informal knowledge of averages. S/he will probably have heard the word 'average' used in phrases and conversations. Discuss the following phrases with your child to try to extract the meaning of the word 'average':

- *Zach drove at an average speed of 55km an hour.*
- *On average, Ellie spends 40 minutes doing homework each evening.*
- *Jude scored an average of six points in each hurling match he played during the league.*
- *The contestant got an average score of 7 from the judges.*
- *The average summer temperature in Carlow last year was 16°C.*

Note: Average is a difficult concept to explain neatly. It is a number or statistic that lies somewhere in the middle. It is the *norm* or *most common* or *typical* amount.

Make the average



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In the above picture, we see three towers of cubes that are not equal. To find the average amount, we redistribute the cubes, so that all three towers become equal. So, the average of 8, 6 and 1 is 5.

Find the average

Get at least 21 small items that can be formed into groups (e.g. pasta shells, grapes, paper clips, beads). Divide the pasta shells into three groups: 6, 10 and 5. Ask your child:

- *How many pasta shells are there in total? (21.)*
- *Are the groups equal? (No.)*

Encourage your child to rearrange the groups such that the groups are equal. In doing so, they should make three groups of 7. Ask your child:

- *Are the groups equal now?*
- *How many shells are in each group?*
- *What is the average of 21? (Yes, 7.)*

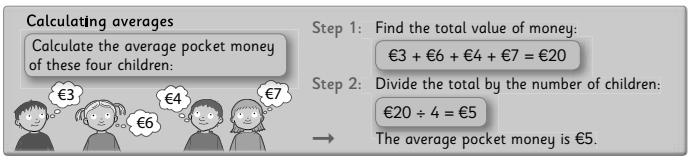
Now instruct your child to rearrange the groups back to their original setting. Ask: *Which group has above/below the average number of pasta shells?*

Extension: Practice this activity with different amounts of groups and pasta shells:

- *16 shells: 4 groups: 3, 5, 7 and 1.*
- *27 shells: 3 groups: 10, 13 and 4.*
- *25 shells: 5 groups: 6, 4, 9, 2 and 4.*

Calculate averages

The quick way to calculate averages is to find the total value of the whole amount and divide it by the number of groups.



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For example, if we want to calculate the average amount of pocket money in this group of children, first we add the amounts to get the total. The total is €20. We then divide €20 by the number of children – €20 ÷ 4 = €5.

Your family will have great fun calculating average scores at home. Ask each person to give a score out of 10 for a specific movie. To find the average, add up the total score and divide by the number of people who voted.

Extension: Complete the same activity to find the average score out of 10 for a specific book, meal, pop song, performance of a sports player… the list is endless!

Averages while shopping

Bring your child shopping with you. Discuss the price of a 6-pack of eggs, e.g. €1·20. Ask him/her to calculate the average cost of an egg, i.e. €1·20 ÷ 6 = 20c.

Discuss the price of four tins of food, e.g. a tin of peas (55c), a tin of prunes (80c), a tin of beans (65c), and a tin of peaches (96c). Ask him/her to calculate the average cost of a tin. Add the prices → 55c + 80c + 65c + 96c = €2·96. Average → €2·96 ÷ 4 = 74c.

Ask questions such as:

- *Which tins cost above the average price? (prunes and peaches)*
- *Which tins cost below the average price? (peas and beans)*
- *Which tin is closest to the average price? (prunes)*

Do this with other groups of items.

Data 2 – Charts and graphs

Your child will be learning to represent and interpret data on bar charts, bar-line graphs, pictograms and multiple bar charts over the coming days. Your child will need to know the language associated with data, such as: information, survey, collect, choose, prefer, vote, altogether, total, bar chart, bar-line graph, pictogram, tally, results, results table, multiple bar chart, title, vertical, horizontal, scale (1:1, 1:2, 1:5, 1:10, 1:100), average.

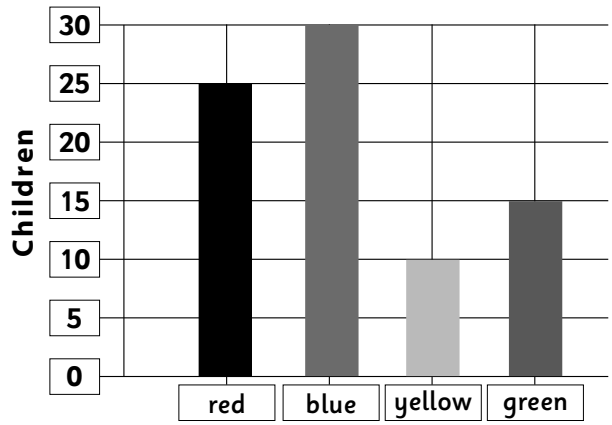
What do graphs and charts have in common?

All graphs and charts must have the following:

- A title e.g. 'Favourite colour'
- Categories that have been labeled, e.g. 'red', 'yellow', 'blue', 'green', 'other'.
- Scale: We use the scale to read the results of the data collected. With smaller amounts of data, the scale may simply count up in 1s or 2s. When dealing with larger amounts of data, the scale may count up in 5s, 10s, 100s or even greater multiples.

Look at this **bar chart** of 'Favourite colour'. It has a scale of 1:5 or 1 to 5.

Favourite colour



On the bottom line, there are four colours represented: red, blue, yellow, green. The results of the bar chart are as follows: red = 25, blue = 30, yellow = 10, green = 15.

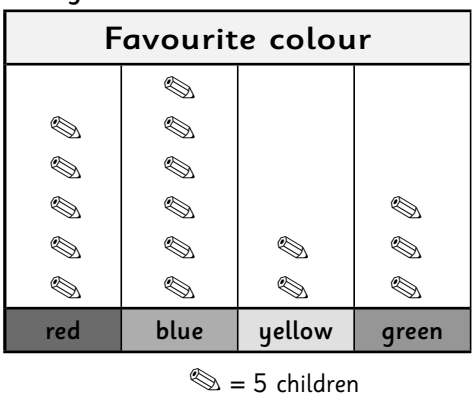
Ask questions to help your child interpret the data that is represented above:

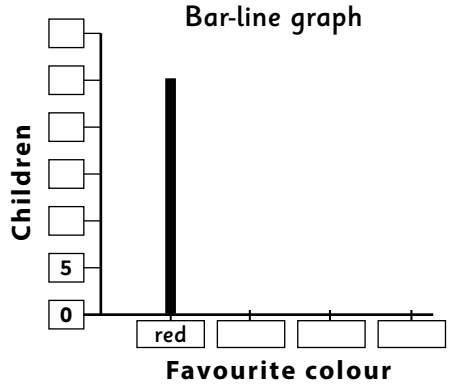
- *What is the title of this bar chart?*
- *What is the scale of this bar chart?*
- *How many categories were there to choose from? Name them.*
- *Which colour is most/least popular?*
- *How many people voted for green?*
- *How many people voted in this survey?*
- *How many more people voted for red than yellow?*
- *How many fewer people voted for red than blue?*

Extension: Encourage your child to collect data about 'favourite colour' from family members and friends. This information should be represented on a block chart, simply using A4 paper. The scale will be determined by the number of people who take part in the survey.

Other graphs

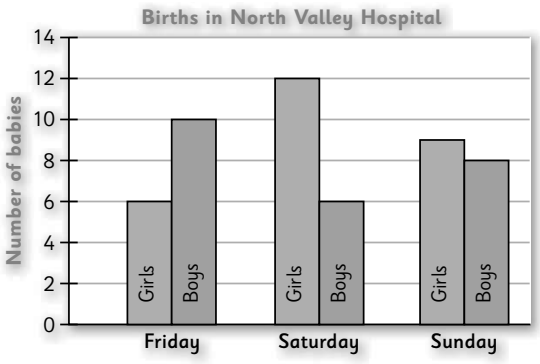
Pictogram





Extension: Encourage your child to collect any data of his/her choice from people at home, e.g. age, favourite animal, favourite type of movie, favourite dinner, etc. Help your child represent the collected data on any of the above types of graphs/charts.

Multiple bar charts



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Multiple bar charts break down information into greater detail. In this multiple bar chart, instead of showing births on a given day, we see births of boys and girls.

Multiplication 1

Your child will be learning about multiplication over the coming days. S/he needs to know the mathematical language associated with multiplication: multiply, multiplication symbol (x), skip count, pattern, relationships, double, near double, two for the price of one, buy one, get one free (commutative property), bigger/greater than, addition/multiplication sentence, inverse, smaller than, less than, pattern, list, grid, repeated addition/equal grouping, half, array, rectangular arrays, rows, columns, equation, represent, digits, vertical, horizontal, product, factor, multiples, common multiple, strategy, estimate, rounding, average, times, groups, weight, kilogrammes, grammes, total, metres, centimetres, total cost, dozen, quantities, decimal number, purchase, tonnes, capacity.

Calculator fun

Invite your child to press [8] [+] [=] [=] [=] [=] on the calculator to show counting in eights (repeated addition). Alternatively, press [6] [4] [−] [8] [=] [=] [=] to show counting back in eights (repeated subtraction).

Variation: Ask your child to key in numbers on the calculator that are definitely not multiples of 8 and count up or back in eights, e.g. [9] [+] [8] [=] [=] [=] [=] **or** [1] [2] [2] [−] [8] [=] [=] [=] [=] [=], etc. This can be done with any of the tables 1–10.

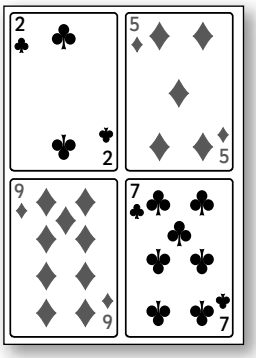
Game 1: Show the biggest number (using two cards)

You will need a pack of playing cards with the picture cards removed for this game. Give each player 10–16 cards. They keep their cards in a pile face-down on the table. Player A turns over the top two cards and multiplies the numbers together. For example, if Player A turns over a 7 and a 9, s/he multiplies them together to get 63. Player B does the same. Player A and Player B compare the totals, and whichever player is showing the bigger of the two totals wins a cube/counter/coin. Play continues like this until all the cards are turned over. Whoever has the most cubes at the end of the game is the winner.

Variation: Players can put out three cards together. They multiply any two of them and add the third to make the biggest number possible. Continue as above.

Game 2: Find my cards

A minimum of three players is required for this game and a pack of cards with the picture cards removed (ace = 1).



Lay out the 40 cards face-up on the table in a four rows of 10 grid. Player A begins. S/he looks at the grid of cards and chooses two cards that are beside each other vertically or horizontally. S/he multiplies the two cards together, for example, 2 of spades and 9 of diamonds to get 18. S/he tells the other players that the answer s/he gets is 18 but does not tell the others which two cards s/he is looking at. The other players have to race to find the two cards or any other two cards that multiply to give the same product (e.g. 3 x 6). However, the cards must be beside each other vertically or horizontally. The first player to see the two cards points to them and wins the pair of cards. The winner of these two cards now takes a turn at picking two cards and multiplying them. Play continues like this until all the cards have been picked up. The winner is the person with the most pairs at the end of the game.

Note: As the grid of cards spreads out, the players can push the cards into a smaller grid.

Multiply a decimal number

Revise rounding of decimal numbers to the nearest whole number with your child. For example, is €14·35 nearer to €14 or €15?

Pose a problem for your child: *If a magazine cost €14·35, estimate how much six magazines cost?* Try to elicit from your child €14 × 6 = €84. Invite your child to work out the actual answer to €14·35 × 6 using the short multiplication method.

$$\begin{array}{r} €14{\cdot}35 \\ \times\ 6 \\ \hline €86{\cdot}10 \end{array}$$

The answer s/he should get will be 8610 (ignoring the decimal point for now). Discuss where the decimal point should go and allow him/her to justify the answer: The options are €0·861, €8·61, €86·1, €861·0. €86·10 is correct as the estimate was €84.

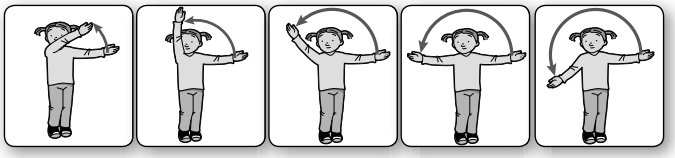
It is essential that your child estimates the answer (by rounding) before carrying out the multiplication problem. After carrying out the procedure, it is crucial that your child compares the actual answer to the estimate.

Lines and angles

Your child will be learning about lines and angles over the coming days. Your child needs to know some of the language associated with lines and angles, such as: angle, space, straight lines, acute, right, obtuse, straight, reflex, full rotation, rotate, protractor, measure, inside/outside scale, degrees.

Angles

Explain the following angles by referring to the pictures below: acute, right, obtuse, straight, reflex.



acute angle | right angle | obtuse angle | straight angle | reflex angle

Note:

- Angles are formed when two straight lines meet, leaving a space between them.

Making body angles

Activity 1

Ask your child to use his/her body parts, e.g. two arms, two legs, one leg (bending at the knee), one arm (bending at the elbow), whole body (bending at the hips), fingers, to create different types of angles.

Activity 2

Yoga poses for children are a fun way to advance this exercise. Your child will have great fun creating different angles with his/her body while moving into interesting yoga poses – many examples of such poses can be found on the internet!

Activity 3

Identify the different types of angles around the home and in the local environment. Go on an 'Angle Hunt' with your child!

Clock angles

Example

= obtuse

= reflex

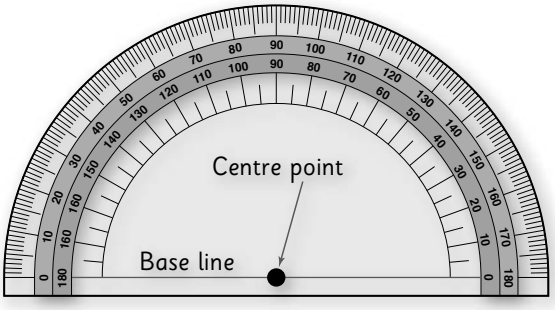
The clock is a great way to explore angles. The long and short hands can be rotated to create all the different types of angles. Encourage your child to make different angle types.

Extension: Challenge your child to discover all the different pairs of numbers on the clock face which make right angles!

Notes:

- When there is no space between the two hands (e.g. 12 o'clock), there is no angle!
- We say that the hands rotate (turn) around the clock.
- A full rotation is when a hand moves the whole way around the clock face.

Using the protractor



Ask your child to explain how to use a protractor. This is a great way to find out if your child understands or is having difficulty with the concept. If extra guidance is needed, read through page 34 of *Busy at Maths 5*.

Extension 1: Draw a selection of acute, right and obtuse angles for your child to measure with a protractor.

Extension 2: Ask your child to draw different angles using a protractor and ruler.

Notes:

- Angles are measured in degrees (°).
- There are 180° on a protractor and in a straight angle.

Making and checking angles

Give your child some materials that they can manipulate, e.g. pipe cleaners, headless matches or lollipop sticks. Encourage your children to make an *acute angle* (less than 90°), a *right angle* (90°) or an *obtuse angle* (greater than 90° but less than 180°). Now ask him/her to trace the angle onto paper to prove that it is in fact the angle you asked for.

Note: There are two scales on every protractor – an *inside* or *outside scale* for measuring the size of angles in degrees. It is usually best and easiest to use the inside scale, as it goes clockwise from 0 to 180°.

Your child will be learning about division over the coming days. S/he needs to know the mathematical language associated with division: sharing, share equally, between/among, shared between, grouping, groups, sets, equal amount, repeated subtraction, divide, left over, remainder, how many times, divided by, exchange, divisible, factor, divisor, dividend, quotient.

20	÷	5	=	4
(dividend)	÷	(divisor)	=	(quotient)

Background information

It is extremely important that children are capable of rapidly recalling the multiplication facts (tables).

Furthermore, children must understand the inverse operation relationship between multiplication and division.

Division can be represented in many ways

It is important that your child becomes familiar with all the ways that division can be represented as well as all the language associated with division.

$\frac{45}{3}$	45 ÷ 3 = __	3 × __ = 45	3) 45	$3\overline{)45}$

Game 1: Countdown!

This game is played by counting down from a given number for each separate number fact. Provide the start number, e.g. 45 for the three times table, and invite your child to count down from that number, e.g. 45, 42, 39, etc.

Game 2: Calculator fun!

Invite your child to press [9] [+] [=] [=] [=] [=] on the calculator to show counting in 9s (repeated addition).

Alternatively, press [1] [0] [8] [−] [9] [=] [=] [=] [=] to show counting back in nines (repeated subtraction).

Variation 1: A similar activity can be used for counting in any group 2–10.

Variation 2: Ask your child to key in higher numbers on their calculators and count up or back in nines, e.g. [1] [2] [5] [+] [9] [=] [=] [=] [=] **or** [2] [5] [0] [−] [9] [=] [=] [=] [=], etc.

Game 3: Can be!

Call out a set of random numbers, one at a time. Invite your child to call out 'Can be', when s/he recognises a number that is divisible by either 3, 6 or 9. A winning answer earns a point. After calling out 'Can be', your child must back his/her claim by proving that the number in question can actually be divided evenly by 3, 6 or 9. For instance, tell your child that we are searching for numbers that can be divided evenly by 9. Call out numbers randomly, '34, 41, 54…' Your child is required to 'interrupt' on 54 by calling out 'Can be'. Your child is then required to prove his/her claim that 54 can be divided evenly by 9 by giving the division sentence 54 ÷ 9 = 6. Award your child a point when s/he provides the division sentence. Continue with another set of numbers.

Variation: Award bonus points to your child if s/he can provide another divisor for this number. In the example above, you may award points to your child if s/he says 6 or 3 as a 'Can be' solution provided s/he completes a correct division sentence, e.g. 54 ÷ 3 = 8.

Short division

Give your child 42 cubes or 1c coins and ask him/her to share them into three even groups/sets. Use plastic plates to hold each set of cubes/coins. Your child works out physically that there are 14 cubes in each set. Invite him/her to write a multiplication sentence to represent what they have made, i.e. 3 × 14 = 42.

Now invite him/her to write a division equation to represent what they have made, 42 ÷ 3 = 14. We now need to show them that this action can be done quickly.

Explain that s/he should rename the 4 tens and 2 units into 3 tens and 12 units.

```
  t u          t  u
3)4 2   →    3)3  12
 ___          ____
```

S/he can now share the 3 tens out evenly among the three cups/plates. Ask:

How many units can now be shared? Yes, 12.

There will be 4 units for each cup/plate. So 42 divided/shared evenly among the 3 cups/plates will be 14.

Ask your child to do this a number of times using cubes while at the same time doing the actual question in his/her copy at the same time.

Your child will be dealing with money over the coming days. S/he will be looking at all coins and notes up to €500. Your children will be dealing with the addition, subtraction, multiplication and division of money. S/he will be solving a wide range of problems including: comparing prices, getting value for money and calculating sale prices. Your child needs to know the mathematical language associated with money: coins, notes, cent, round, estimate, prices, cost, comparing, save, value, shop bills, receipt, budget, quiz.

Giving change from €50

Encourage your child to 'count up like a shopkeeper' mentally. Give them tasks such as *'If I owe €23·95 and I hand the shopkeeper €50, how much change should I get?'*

Encourage your child to count on when giving change, e.g. €23·95 + **5c** → €24 + **€1** → €25 + **€5** → €30 + **€20** → €50.

Change = 5c + €1 + €5 + €20 = €26·05.

Extension: When out shopping with your child, encourage him/her to calculate the change you expect to receive from the shopkeeper before you head to the till/cash register.

Shopping trips

Bring your child along to help with the grocery shopping.

Activity 1: As you walk through the aisles, ask your child to look for the prices of the items you wish to purchase. Encourage your child to round the price of each item to the nearest euro. Using these rounded prices, ask your child to keep track of the approximate total cost of the items in the trolley. When you get to the till, compare the estimated total with the actual total shopping bill.

Activity 2: On your shopping trips, look out for special offers which involve multipacks and money off. Give your child a calculator and encourage him/her to calculate the prices of individual items:

- *This 2l carton of milk has 50% extra free. Is it better value than this 3l carton of milk?*
- *How much does a pack of 12 toilet rolls cost? Calculate the cost of one toilet roll.*
- *How much does a single tin of tomatoes cost? How much does a multipack of three tins cost? Calculate the cost of one tin from the multipack. Which is better value, three single tins of tomatoes or the multipack of three tins?*

Tip: To find the best value for money, we always break the price down to a single unit, e.g. we get the price of 1l, 1kg, one tin, one single banana, etc.

Receipts

Keep a receipt from a grocery shop. Sit down with your child and analyse the receipt.

- *Did the customer buy more than one of any item? Which items?*
- *How many items did the customer purchase?*
- *If two toothbrushes cost €6·26, what is the cost of three toothbrushes?*
- *Look at the price of a bag of apples. What would be the cost of four bags of apples?*

Catalogue shopping

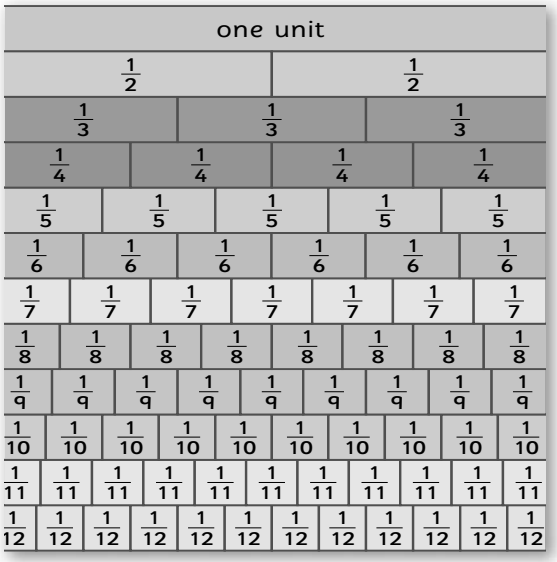
Give your child a catalogue or brochure from two different shops. Ask him/her to compare the prices of similar items between the two shops. Ask questions such as:

- *In which shop would you buy the cheaper tube of toothpaste/basketball/pillow?*
- *How much money would you save if you bought a bicycle in Shop 1 rather than Shop 2?*
- *What is the cost of buying seven basketballs in Shop 2?*

Your questions will be determined by the catalogues/ brochures you are using.

Your child will be learning about fractions – up to twelfths – over the coming days. Your child needs to know some of the mathematical language associated with fractions, such as: fractions, fraction wall, order, match, multiply, numerator, denominator, equivalent, amount, proper/improper fractions, mixed numbers, number line, express, whole number.

Comparing fractions



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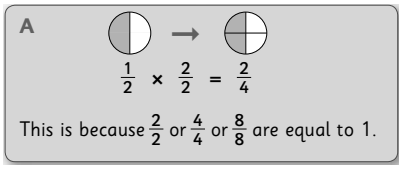
Fraction walls are a very effective way to compare fractions. You could ask your child's teacher for a photocopy of the strips which make up a fraction wall or they could be downloaded off the internet. Alternatively, look at the fraction wall on page 51, *Busy at Maths 5*. Once you have a fraction wall, the different fractions can be compared.

- *Which is bigger, $\frac{1}{2}$ or $\frac{1}{3}$?*
- *How many sixths make up $\frac{2}{3}$?*
- *How many fifths are the same as $\frac{6}{10}$?*
- *Which is smaller, $\frac{3}{11}$ or $\frac{2}{5}$?*
- *How many ninths make up a whole unit?*

Equivalent fractions

Many fractions have more than one name, e.g. $\frac{1}{2}$ is the same as $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$ and so on. We can see this clearly on the fraction wall. In school, your child will be learning that if we multiply any number by 1, it stays the same. Similarly, if we multiply any fraction by one whole (which can be $\frac{2}{2}$, $\frac{3}{3}$, $\frac{4}{4}$, $\frac{5}{5}$ and so on), the fraction will look different, but it will have the same value. This is how we quickly calculate equivalent fractions.



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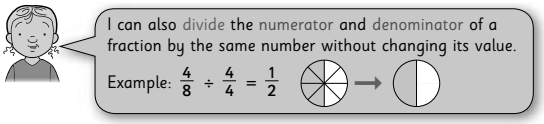
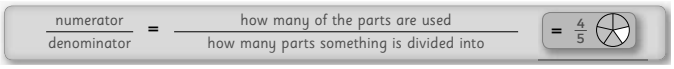


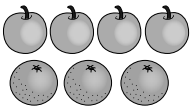
Similarly, dividing by one whole will also give us equivalent fractions.

What is a fraction?

Explain to your child that the figure above the line is called the **numerator** and the figure below the line is called the **denominator**.

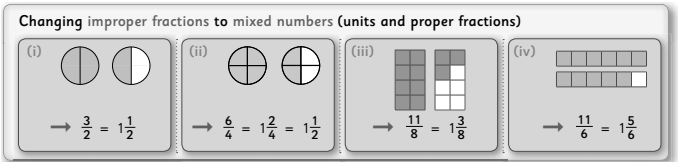


Make a fraction, using this picture:



What fraction of the fruit are apples?
$\frac{4}{7}$ – There are four apples.
– There are seven pieces of fruit in total.

Improper fractions to mixed numbers



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Give your child the following improper fractions to convert to mixed numbers: $\frac{5}{2}$, $\frac{7}{3}$, $\frac{6}{4}$, $\frac{10}{5}$, $\frac{12}{5}$.

Find the whole amount

Many children find this concept quite difficult, as they are not starting with the whole amount. For this activity, you will need an A4 sheet of paper divided into eight equal pieces and at least 24 cubes/marbles/pasta shells. Pose a problem to your child such as: $\frac{5}{8}$ *of my cubes is 15. How many cubes do I have altogether?*

- *How many equal pieces has the paper been divided into? Yes, eight.*
- *How many of the eighths contain cubes? Yes, just five.*
- *Now, divide the 15 cubes among these five sections. How many cubes are there on $\frac{1}{8}$? Yes, $\frac{1}{8} = 3$.*
- *If we know $\frac{1}{8}$, how can we find $\frac{8}{8}$? Yes, we simply multiply the answer by 8. So, $3 \times 8 = 24$. The total is 24.*

Encourage your child to place three cubes upon each section/eighth to verify the answer.

2-D shapes

Your child will be learning about 2-D shapes (shapes with only two dimensions – length and width/breadth) over the coming days. Some of this work will be revision, but new shapes include the right-angled triangle, irregular quadrilaterals and the trapezium. Your child needs to know the mathematical language associated with 2-D shapes: parallel lines, angles (acute, right, obtuse), pentagon, semi-circle, octagon, triangles (equilateral, isosceles, scalene, right-angled), quadrilaterals, square, rhombus, rectangle, parallelogram, trapezium, regular, irregular, polygon, symmetry, pentominoes, tessellation (regular, combined), tangrams.

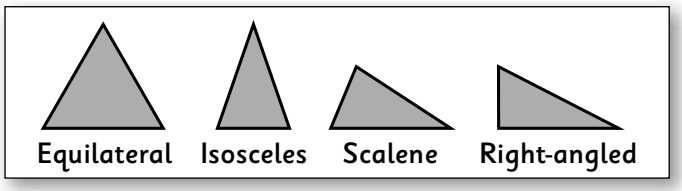
Notes for parents

- 2-D shapes are flat. They are pictures. 2-D shapes cannot be held.
- Angles are formed where two straight lines meet. Therefore, a semi-circle and an oval do not have angles.
- Polygons are 2-D shapes with straight sides.
- Regular polygons:
  - Have straight sides (all polygons!).
  - Have sides that are all of equal length.
  - Have angles that are all of equal size.
  - Are symmetrical.
- All other polygons are irregular.

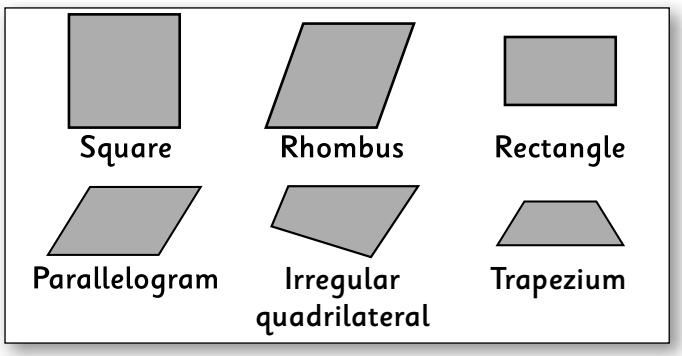
There is considerable international debate as to what constitutes a regular or irregular shape. *Busy at Maths* uses the criteria above. This means that circles and rectangles are classified as irregular shapes.

Triangles and quadrilaterals

Types of triangle



Types of quadrilateral



Discuss the different 2-D shapes with your child by asking such questions as:

- *Which of these shapes are polygons?*
- *How many regular polygons do you see?*
- *How many sides does a rectangle/trapezium have?*
- *How many angles does a square/scalene triangle have? Name them.*
- *Which shape looks like a rectangle that has been pushed out of shape?*
- *How many sets of parallel sides does a square/trapezium have?*
- *Which triangle has no equal sides?*
- *Describe an equilateral triangle/trapezium.*

Extension 1: With your child, take turns 'drawing' shapes on each other's backs with your finger. The object of the game is to guess the shape that has been drawn.

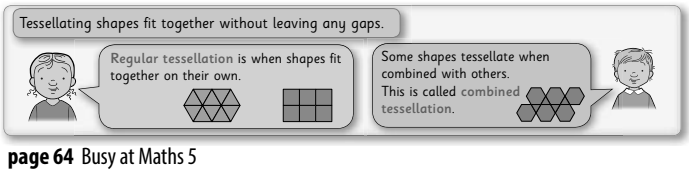
Extension 2: Using small, straight objects from the home (e.g. crayons, penne, dry spaghetti, paper clips), encourage your child to make 2-D shape pictures/representations.

Extension 3: Identify the shapes that are symmetrical (can be folded into two identical halves).

Extension 4: Together, find examples of the above 2-D shapes in the home or environment.

Tessellating shapes

Tessellating shapes fit together without overlapping or leaving gaps. Sometimes two or more different shapes can be combined to fit together without leaving gaps. With your child, search for examples of regular and combined tessellation around the home or environment (e.g. tiles, flooring).



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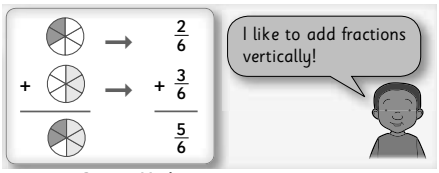
Your child will be learning about addition, subtraction and multiplication of fractions over the coming days. S/he needs to know some of the mathematical language associated with fractions, such as: adding, subtracting, multiplying, mixed numbers, amount, simplify, different denominations.

Adding and subtracting fractions with the same denominator

Fractions with the same denominator (number on the bottom) are easy to add and subtract.



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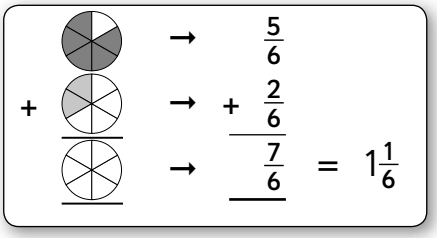
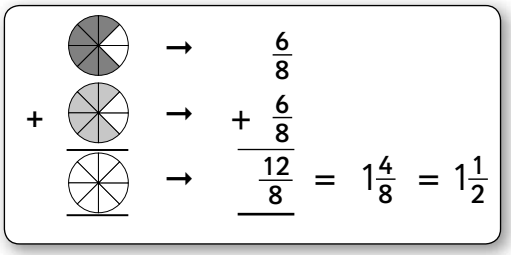
Sometimes the answer will be an improper fraction (the top will be larger than the bottom). In such cases, your child will need to change the answer to a mixed number (a whole number and a fraction).

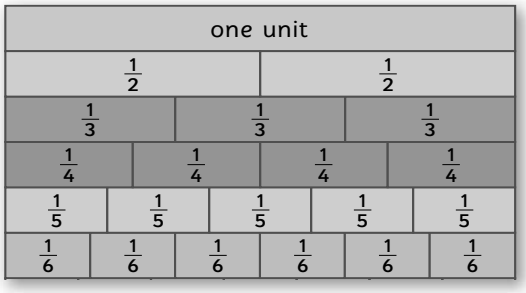


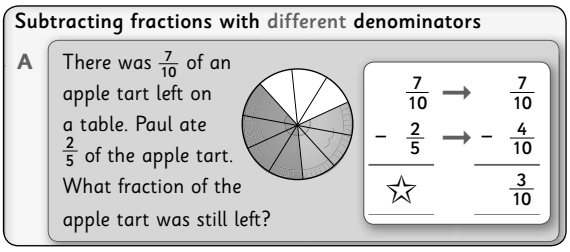
Sometimes the answer can be simplified even further:



Adding and subtracting fractions with different denominators

We cannot add or subtract fractions with different denominators. One of the fractions must be changed to an equivalent fraction (an equivalent fraction has the same value but a different denominator). The fraction wall below makes it easy for your child to change the denominator of a fraction to another denominator.





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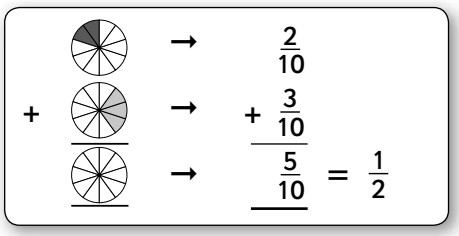
$$\frac{1}{5} + \frac{3}{10} = ?$$

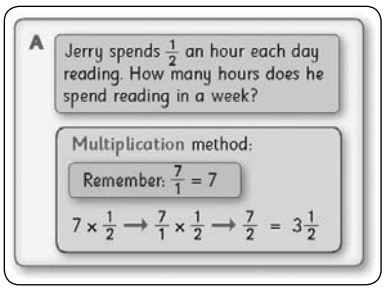
In this example, we can rename $\frac{1}{5}$ as $\frac{2}{10}$:



Once the denominators are the same, we can add or subtract as before. Your child should be encouraged to simplify his/her answers where possible.

Multiplying fractions by a whole number

Your child will learn how to multiply a fraction by a whole number.



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$$\frac{2}{8} \times 3 = \frac{6}{8}$$

We teach the children to change the whole number to a fraction. 3 units can be written as $\frac{3}{1}$. Now, your child can multiply a fraction by a whole number.

$$\frac{2}{8} \times \frac{3}{1} = \frac{6}{8}$$

The simple rule is to 'multiply the top by the top' and the 'bottom by the bottom'.

Your child will be learning about decimals involving tenths, hundredths and thousandths over the coming days. S/he will need to know the mathematical language associated with decimals: equals sign, calculator, tenths, hundredths, thousandths, decimals, decimal number, decimal fraction, bigger, smaller, unit, ten, hundred, thousand, equal part, odd one out, whole numbers, decimal point, value of digits, placeholder, rectangles, metre, centimetre, swap, after, before, between, less, more than, groups of, sets of, bundles of, count, match, count forwards, count backwards, hundreds house, tens house, units house, tenths house, hundredths house, divide, kilogramme, gram, litre, millilitre, kilometres.

Definitions

- A **decimal number** is a number that has a decimal part, e.g. 9 is a whole number but 9·**3** is a decimal number.
- A **decimal fraction** is the decimal part of a decimal number, e.g. 9·**345** is a decimal number but $\frac{345}{1000}$ or ·**345** is the decimal fraction as it is less than 1.

The decimal point

Discuss the function of the decimal point with your child. We use a decimal point to separate the units from the fractions. Anything to the left of the decimal point is made up of whole numbers; anything to the right of the decimal point is made up of fractions or pieces of numbers. The decimal point is always placed between the units and the tenths house. Explain that 0·437 in words is: zero point four three seven **or** 437 thousandths **or** four tenths + 3 hundredths + 7 thousandths.

Note: It is important to make the connection between fractions and decimals at all times, where possible.

Calculator fun

Invite your child to enter [0] [•] [1] [+] into his/her calculator. Ask him/her to keep pressing the equals sign ([=]). The display on the calculator will count up in tenths ($\frac{1}{10}$), [0] [•] [1], [0] [•] [2] … [0] [•] [9], stop your child here, if possible, and ask him/her to suggest what s/he thinks the next decimal number displayed on the calculator will be. Allow him/her to explain his/her reasoning. Then invite your child to offer explanations as to why the calculator displays 1·0 after 0·9 instead of 0·10.

Extension: Proceed as above but this time, invite your child to enter [0] [•] [0] [1] [+] into the calculator. Invite your child to keep pressing the equals sign ([=]). Ask your child why 0·02/0·03/0·04, etc. is displayed on the calculator instead of 0·10/0·20/0·30. Then invite him/her to predict what the screen will display after 0·99.

Making decimal numbers from materials in the environment

Give your child a piece of string/cord measuring 1 metre. Invite him/her to cut the metre into ten equal parts. Allow him/her to discover that the length of $\frac{1}{10}$ or 0·1 of a metre is actually 10cm. Similarly, invite your child to cut up one of the 10cm strips into ten equal parts. Allow him/her to discover that the length of $\frac{1}{100}$ or 0·01 of a metre is actually 1 centimetre (1cm). Finally, invite your child to cut up the 1cm into ten equal parts to get $\frac{1}{1000}$ or 0·001 of a metre which is actually 1 millimetre (1mm).

Extension 1: Get a kilogramme (1,000g) bag of sugar/pasta shells (or anything that you have to hand) and ask your child to divide it into 10 equal parts (100g), 100 equal parts (10g) and 1,000 equal parts (1g).
A 1 litre (1,000ml) bottle of water could also be divided into 10 equal parts (100ml), 100 equal parts (10ml) and 1,000 equal parts (1ml).

Extension 2: Discuss $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{4}{5}$, 0·2, 0·4, 0·33, etc. of the amounts above in metres, litres and kilgrammes.

Dice lotto

Materials required: Four different-coloured dice (9-sided dice is ideal but, if not available, 6-sided dice will suffice), digit cards, red counter representing decimal point, cubes

Player A rolls the four dice and makes the biggest decimal number (to three decimal places) possible, e.g. if Player A rolls a 3, 6, 7 and 3, the biggest decimal number Player A can make is 7·633. Player A can write the number on a piece of paper. Player B takes his/her turn to make the biggest decimal number possible with the four dice. If s/he rolls a 4, 3, 6 and 5, the biggest number s/he makes is 6·543. Player B can also write the number on a piece of paper. Whichever player's number is the biggest wins a cube. In the above scenario, Player A wins a cube as 7·633 is bigger than 6·543. Play continues as above until a player wins five cubes.

Your child will be learning about multiplication over the coming days. S/he needs to know the mathematical language associated with multiplication: multiply, multiplication symbol (x), skip count, pattern, relationships, double, near double, two for the price of one, buy one get one free (commutative property), bigger/greater than, addition/multiplication sentence, inverse, smaller/less than, double, near double, list, grid, repeated addition/equal grouping, half, rectangular arrays, rows, columns, equation, represent, digits, power of ten, extended tables, vertical, horizontal, product, factor, multiples, common multiple, strategy, estimate, rounding, decimal number, tonnes, weight, kilogrammes, litres, metres, kilometres, height.

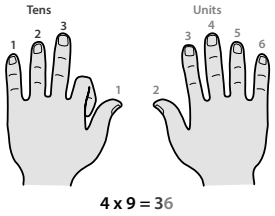
Calculator fun

Invite your child to press the 9 key followed by the + key followed by the = key. Ask him/her to continue pressing the = key on the calculator to show counting in nines (repeated addition).

Alternatively, press 72 followed by the – key, followed by the 9 followed by the = key. Ask him/her to continue pressing the = key on the calculator to show counting in nines (repeated subtraction).

Variation 1: Ask your child to key in numbers on the calculator that are definitely not multiples of 9 and count up or back in nines, e.g. 11 + 9 = = = **or** 1 4 3 – 9 = = = . This can be done with any of the multiplication and division tables 2–10.

Game 1: Nine facts and fingers



Invite your child to place both hands face-down on the table. Ask him/her to mentally number his/her fingers from left to right, beginning with 1 on the small finger on the left hand. Now invite him/her to bend under his/her fourth finger as s/he is multiplying by 4. Tell him/her that the fingers to the left of the bent-under finger are tens (s/he can count the three tens) and the fingers to the right of the bent-under finger are units (s/he can count the six units). Therefore, the answer to $4 \times 9 = 36$. Similarly, for 3×9, bend under the third finger on the left hand. There are two fingers to the left of the bent finger (two tens) and seven fingers to the right (seven units). So, $2 \times 9 = 27$.

Invite him/her to show other number facts involving nines using fingers and allow him/her to work out the answer for him/herself.

Game 2: Find my cards

A minimum of three players is required for this game and a deck of cards with only the cards 1–10. Lay out all 40 cards face-up on the table in a 4×10 grid. Player A begins. S/he looks at the grid of cards and chooses two cards that are beside each other vertically or horizontally. S/he multiplies the two cards together, e.g. 6 of clubs and 3 of diamonds to get a product (answer) of 18. S/he tells the other players the answer s/he gets is 18, but does not tell the others which two cards s/he is looking at. The others now have to race to find the two cards or any other two cards that multiply to give the same product (e.g. 9×2). However, the cards must be beside each other vertically or horizontally. The first player to see the two cards and point to them wins the pair of cards. The winner goes next. Play continues like this until all the cards have been picked up. The winner is the person with the most pairs at the end of the game.

Note: As the grid spreads out, the players can push the cards into a smaller grid for convenience.

Multiplying a decimal number

Revise rounding decimal numbers to the nearest whole number with your child. For example, is €14·35 nearer to €14 or €15?

Multiplying a decimal number (to two places) by a two-digit number

Pose a problem: *If a magazine costs €14·35, estimate how much six magazines cost*. Elicit from your child that $€14 \times 6 = €84$. Now invite your child to work out the actual answer to $€14{\cdot}35 \times 6$ using the short multiplication method. The answer s/he should get will be 861 (ignoring the decimal point for now).

Discuss with your child where the decimal point should go and allow him/her to justify his/her answer. The options are €0·861, €8·61, €86·1 and €861·0. €86·1 is correct, as the estimate was €84.

It is essential that your child always estimates first (by rounding) to find the answer to a multiplication problem involving decimals. After carrying out the procedure, it is crucial that s/he compares the answer to the original estimate.

Your child will be learning about division over the coming days. Your child needs to know the mathematical language associated with division: divide, sharing, share equally between/among, shared between, grouping, groups, sets, equal amount, repeated subtraction, divide, left over, remainder, how many times, divided by, exchange, divisible, factor, divisor, dividend, quotient, decimal number.
Note: All activities outlined on Sheet 9 for Chapter 9 are also relevant to this chapter. You may wish to revise some of those activities with your child.

Division can be represented in many ways

Your child must become familiar with all the ways that division can be represented as well as all the language associated with division.

$\frac{72}{4} = \_\_\_\_$ $\quad 72 \div 4 = \_\_\_\_$

$4 \times \_\_\_\_ = 72$ $\quad 4\overline{)72}$

Game: Countdown

This game is played by counting down from a given number for each separate number fact. Provide the start number, e.g. 72 for the four times table, and invite your child to count down in fours from that number.

Round decimal numbers

Make a simple counting stick – a sheet of paper with 10 equal divisions will do. Tell your child that the first marking on the counting stick is 0 and the final marking is 1. Invite him/her to show you where 0·7 is on the counting stick. Ask him/her: *Is 0·7 nearer to 0 or 1? Yes, 1! Therefore, 0·7 rounds **up** to 1.*

Now tell your child that the first marking on the counting stick is 3 and the final marking is 4. Invite him/her to show you where 3·4 should be on the counting stick. Ask questions such as: *Is 3·4 nearer to 3 or 4? Yes, 3! Therefore, 3·4 rounds **down** to 3.*

Work similarly for other decimal numbers. Include decimal numbers such as 5·16 and ask: *Is 5·16 nearer to 5 or nearer to 6? Yes, 5! So 5·16 rounds **down** to 5.*

Money can also be used to help your child decide which whole number a decimal number (up to two places) rounds to. For example, ask: *Is €14·87 nearer to €14 or €15? Yes, €15! Therefore, €14·87 rounds **up** to €15.*

Short division (no remainders)

Give your child 52 cubes, counters, pasta shells or 1c coins and ask him/her to share them into four even groups/sets. Use plastic cups or plates to hold each set of cubes/counters/pasta shells/1c coins. Your child works out physically that there are 13 cubes in each set. Invite him/her to write a multiplication equation to represent what they have made: 4 x 13 = 52. Now invite him/her to write a division equation to represent what s/he has made: 52 ÷ 4 = 13.

You now need to show your child that this action can be done quickly. Explain that s/he should rename the 5 tens and 2 units into 4 tens and 12 units.

t	u		t	u
4)5	2	→	4)4	12

S/he can now share the 4 tens out evenly among the three cups or plates. How many units can now be shared? Yes, 12! There will be 3 units for each cup/plate. *So 52 divided/shared evenly among the four cups/plates will be 13.*

Ask your child to do this a number of times using cubes/counters/pasta shells/1c coins while doing the actual question in his/her copy.

Extension: Allow your child to use 48 counters, but use a different amount of cups, e.g. two, six or eight, to share in equal amounts. Invite your child to write a multiplication and division equation to represent what s/he has made. Finally, invite your child to work out the answer using the quick method as shown above.

Short division (with remainders)

Give your child 55 cubes/counters/pasta shells/1c coins and ask him/her to share them into four even groups/sets. Use plastic cups or plates to hold each set of cubes/counters/pasta shells/1c coins. Your child works out physically that there are 13 cubes in each set but that three cubes are left over. Now invite him/her to write a division equation to represent what s/he has made: 55 ÷ 4 = 13 R 3. You now need to show your child that this action can be done quickly, as done with the question with no remainders above.

Calculator fun

Your child will be learning about using the calculator over the coming days. This was also done in 4th Class. S/he needs to know the mathematical language associated with the calculator: calculator, key, clear key, clear entry, calculation, estimate, calculate, screen display.

The role of the calculator

'An understanding of the structure of number can be enhanced by the exploration of patterns, sequences and relationships with a calculator. Calculators help in the development of problem-solving skills by allowing the child to focus on the structure of a problem and possible means of solution. Calculators can be used to check estimates, to perform long and complex computations, and to provide exact results to difficult problems. However, the calculator cannot be a substitute for practical activity with materials. Moreover, it must be remembered that the child needs a sound understanding of number to make judgements about when it is appropriate to estimate, to calculate mentally, to make a calculation on paper, or to use a calculator for an exact result. For these reasons, this curriculum provides for the use of calculators in mathematics from fourth to sixth classes, by which time the child should have acquired a mastery of basic number facts and a facility in their use.'
(DES, 1999, page 7)

Clear and clear entry keys

The clear (C) key deletes all the numbers you have entered. The clear entry (CE) key only deletes the last number you entered. Invite your child to press the clear key (C) before s/he starts a new problem or if s/he makes a mistake.

Note: It is essential to encourage your child to estimate the answer to a problem prior to performing it on a calculator.

Repeated addition

Invite your child to key in the number 9 on the calculator followed by the = key. Now ask your child to keep pressing the = key to count up in 9s with the calculator. All the multiples of 9 should appear. This is a good way to explain and learn all the multiplication tables as repeated addition.

Repeated subtraction

Invite your child to key the number 72 into the calculator followed by the − key, followed by the 8 key. Now ask your child to keep pressing the = key to count back in 8s with the calculator. This is a good way to explain and learn all the division tables. It shows division as repeated subtraction.

Addition

Most children will be familiar with performing the basic operations on a calculator. Demonstrate how to add two numbers, e.g. 24 + 37, by pressing the 2 , 4 , + , 3 , 7 , = keys in that order. Now invite your child to add together three, four or five numbers on the calculator.

Subtraction

Demonstrate how to subtract two numbers, e.g. 73 – 29, by pressing the 7 , 3 , − , 2 , 9 , = keys in that order.

Multiplication

Ask your child to perform various multiplication problems by using the multiplication (×) key.
For example, ask him/her to solve 24 × 52 by pressing 2 , 4 , × , 5 , 2 , = keys in that order.

Repeated multiplication

Ask your child to key 4 , × , 3 , = , = , = into his/her calculator to see how the display changes.

Division

Invite your child to perform various short division problems by using the division (÷) key. For example, ask him/her to solve 96 ÷ 4 by pressing the 9 , 6 , ÷ , 4 , = keys in that order.

Calculator letters and words

Ask your child to type a number into his/her calculator, e.g. 5338. Turn the calculator upside down and read the letter each individual digit makes. 5338 makes the word BEES. Invite your child to make as many words as s/he can by using these letters. There are at least 250!

Examples:

618 = BIG	7108 = BOIL
733 = EEL	35336 = GEESE
4614 = HIGH	3751 = ISLE

Your child will be learning about length over the coming days. S/he will learn about units of measurement, including the millimetre (mm), centimetre (cm), metre (m) and kilometre (km). S/he will be learning how to express these lengths in both fraction and decimal form. Your child will learn how to add, subtract, multiply and divide units of length, calculate the perimeter of 2-D shapes, measure objects and solve real-life problems involving length. S/he needs to know the mathematical language associated with the metric system: millimetre, centimetre, metre, kilometre, record, estimate, measure, add, subtract, decimal point, multiplication, division, problem, length, depth, perimeter, convert.

Get measuring – Millimetres, centimetres and metres

Get a ruler and a metre measure (a metre stick, a metre strip or a metre on a tape measure). Discuss the markings on both the ruler and the metre, and ask questions such as:

- *How many cm/mm are on the ruler?*
- *How many mm are in a cm?*
- *How many cm/mm are in a metre?*
- *How many m are in* $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$ *of a metre?*
- *Would you use a ruler or a metre measure to measure the height (or length or width) of a mug/radiator/door/plant/shoe/fingernail?*

Extension: Gather a selection of household items and ask your child to measure the length, height or width of each. Encourage your child to write the lengths both in fraction and decimal form, for example:

1mm	=	$\frac{1}{10}$cm	**or**	0·1cm
2cm	=	$\frac{2}{100}$ m	**or**	0·02m
79cm	=	$\frac{79}{100}$ m	**or**	0·79m

How far is a kilometre?

Explain to your child that a kilometre is 1,000m long. Kilometres are used to measure longer distances than we have previously looked at. Discuss distances that are measured in kilometres, e.g. the journey from Longford to Cork, Dublin to London, your house to a local attraction, e.g. castle/park/lake.

Extension 1: When going on a familiar journey in the car, ask your child to predict where you will be after 1km. Measure the distance on the car's odometer. Discuss the outcome with your child – does a kilometre feel longer or shorter than s/he imagined?

Extension 2: Walk a kilometre with your child. Time how long it took you to walk this distance.

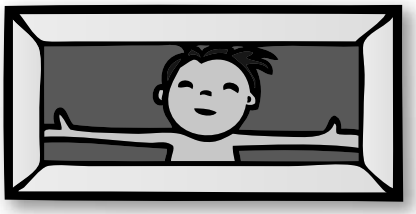
The kilometre – Atlas work

Look at an atlas (physical or online) with your child. Ask him/her to predict how many kilometres are between two different locations, e.g. Galway and Longford, Dublin and London. Use the atlas to calculate the actual distances.

Extension: Encourage your child to write the lengths in both fraction and decimal form, for example:

1m	=	$\frac{1}{1000}$ km	**or**	0·001km
23m	=	$\frac{23}{1000}$ km	**or**	0·023km
980m	=	$\frac{980}{1000}$ km	**or**	0·98km
1893m	=	$\frac{1893}{1000}$ km	**or**	1·893km

Calculating perimeters



Invite your child to find a simple rectangular photograph or picture frame. Using a ruler, ask him/her to measure the length of each side. Then ask him/her to add the four lengths to find the perimeter of the frame.

Extension 1: Encourage your child to find an easier/quicker way of calculating the perimeter, e.g. *The two long sides are the same length and the two shorter sides are the same length. So I could add one long side and one short side and multiply my answer by 2!*

Extension 2: Encourage your child to calculate the perimeter of a selection of household objects, e.g. table, television, mirror. To challenge him/her, invite him/her to calculate larger perimeters, such as the perimeter of a bedroom, garden, kitchen, path, etc.

Percentages 1

Your child will be learning about percentages for the first time over the coming days. Your child needs to know some of the mathematical language associated with percentages: per cent, percentage, fraction, units, hundredths, change, number line, smallest, largest, amounts.

What does 'per cent' mean?

Your child will have heard the word 'per cent' used informally over the past number of years, for example:

- James got 100% in his test.
- Mam's mobile phone battery is down to 40%.
- The television's recording box is 80% full.
- The players gave 100% effort during the game.

Explain to your child that 'per cent' means 'per hundred' or 'out of one hundred'. For example, if there are 100 apples in a crate and 94% of them were sold, then 94 apples were sold.

Research percentages

Look up some interesting percentage facts with your child and discuss them, for example:

- *What percentage of the world is covered by land?*
- *What percentage of a tomato is actually water?*
- *What percentage of the world's population speaks Spanish?*
- *What percentage of the human body is made up of blood?*

Fractions as percentages

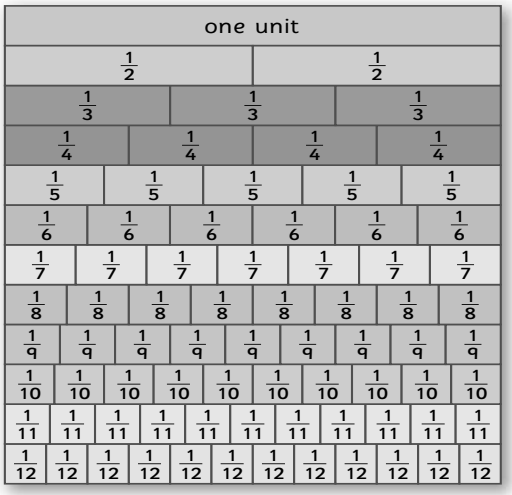
We know that 'per cent' means 'per hundred', so when a fraction is written as hundredths, it is simple to change it to a percentage:

$$\frac{1}{100} = 1\%$$
$$\frac{79}{100} = 79\%$$

Your child has already learned that other fractions can be changed to equivalent fractions (fractions that look different but have the same value) by multiplying by 1 unit (e.g. $\frac{2}{2}$, $\frac{3}{3}$, $\frac{10}{10}$). So by changing a fraction to hundredths, we can easily change them to percentages:

$$\frac{3}{10} \times \frac{10}{10} = \frac{30}{100} = 30\%$$
$$\frac{4}{20} \times \frac{5}{5} = \frac{20}{100} = 20\%$$
$$\frac{3}{4} \times \frac{25}{25} = \frac{75}{100} = 75\%$$

Once the denominators (the numbers on the bottom of a fraction) are the same, we can add or subtract them, as done earlier. The children are always encouraged to simplify their answers where possible.



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Find a percentage of the whole

You will need concrete items for sharing, e.g. cubes/counters/marbles/coins. Explain to your child that you have 20 cubes in your hand and you want to give 30% of them to your friend. Explain that in order to find a percentage of a number, you must change the percentage into a fraction: 30% = $\frac{30}{100}$ or $\frac{3}{10}$. So we must find $\frac{3}{10}$ of the 20 cubes.

Share the cubes equally into 10 piles until they are all gone. Ask your child questions such as:

- *How many cubes are in each pile? Yes, 2!*
- *Have the cubes been shared equally? Yes!*
- *So, what is $\frac{1}{10}$ of 20? Yes, it is 2!*
- *If $\frac{1}{10}$ is 2, what is $\frac{3}{10}$? Yes, $2 \times 3 = 6$!*

Percentages at home

Look at the weights of different food objects in your kitchen. Ask your child to calculate different percentages of each, for example:

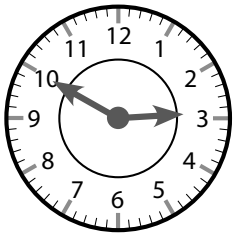
- *What weight is 40% of this bag of flour?*

Test percentages

When your child brings home test scores that are written in fraction form, help him/her to convert the scores into percentages, e.g. $\frac{19}{20} = \frac{95}{100} = 95\%$.

Your child will be learning to read the time on both the analogue and digital clock using the 24-hour system over the coming days. This will be your child's first formal introduction to the am and pm system. Your child will also practise adding and subtracting hours and minutes, analysing timetables and solving real-life problems involving time. S/he will need to know the language of time: hours, minutes, analogue/digital time, addition, subtraction, 24-hour clock, bus and rail timetables, television guide, intervals.

Read the time on the analogue clock



Get an analogue clock (ordinary clock with markings 1–12) that you and your child can manipulate (move and change the hands). Make different times and ask your child to read the times, e.g. *10 past 6, 7 o'clock,* $\frac{1}{4}$ *to 9, 25 past 2, 13 minutes to 11.* Similarly, you can call out a specific time and ask your child to show that time on the clock.

Extension 1: Focus your child's attention on the position of the short (hour) hand as the long hand moves around the clock. The short hand will point exactly at a number only at an *o'clock* time (exact hour). For example, at 4 o'clock the short hand will point exactly at 4. At $\frac{1}{2}$ past 4, the short hand will point halfway between 4 and 5. These changes in position are subtle but very important!

Note: am stands for *ante meridiem*, which means 'before noon'. Many people alter this to 'after midnight'. **pm** stands for *post meridiem*, which means 'afternoon'. Many teachers help children by changing the abbreviation to 'past midday'.

Extension 2: The analogue clock only deals with the 12-hour clock system. To encourage your child's understanding of the 24-hour clock system, ask him/her to make times such as 'quarter past 4 in the morning' or '27 minutes to 6 in the afternoon'. When s/he makes the time on the clock, make sure that s/he says whether the time is am or pm.

Read the time on the digital clock

Find a digital clock that your child can manipulate, e.g. a mobile phone clock, a watch or an alarm clock. The digital clock is used very often in our daily lives and children often find it easier than the analogue clock. Ask your child to read the time, remembering that the hour comes first and the minutes come after. Call out specific times and ask your child to 'make' these digital times on his/her digital clock.

Extension 1: 'Make' a specific time on your analogue clock, e.g. 22 minutes past 7. Add in am or pm and ask your child to 'make' the equivalent time on the digital clock, e.g. 07:22.

Extension 2: Look through timetables in magazines, newspapers or online (e.g. television timetables, bus and rail timetables, cinema guides) and ask your child to read the times.

Timetables

Look through timetables in magazines, newspapers or online (e.g. television timetables, bus and rail timetables, cinema guides). Ask questions to ensure that your child understands how to read a timetable, for example:

- *What time does the first train leave at?*
- *How long does it take the train to travel from Newbridge to Limerick Junction?*
- *If the second train was delayed in Templemore for 17 minutes, at what time did it arrive in Limerick Junction?*

Extension: Give a timetable to your child. Ask him/her to write four or five questions about the timetable for you or another family member to answer.

Real-life word problems

Set simple but meaningful small problems for your child on a regular basis, for example:

- *If we leave for swimming at 16:20 and the journey takes us 17 minutes, what time will we arrive at?*
- *If I walk into the supermarket at 11:04 and leave at 11:48, how long did I spend inside?*
- *If we go swimming at 15:45 and the lesson lasts 1 hour 28 minutes, at what time will it end?*
- *I brush my teeth at 07:50 and leave for school 35 minutes later. At what time do I leave for school?*
- *Lunch break starts at 12:25 and lasts for 36 minutes. At what time does lunch break finish?*
- *A football match started at 14:45 and lasted for 1 hour and 12 minutes. At what time did the football match end?*
- *A film started at 17:55 and lasted for 2 hours and 16 minutes. At what time did the film finish?*

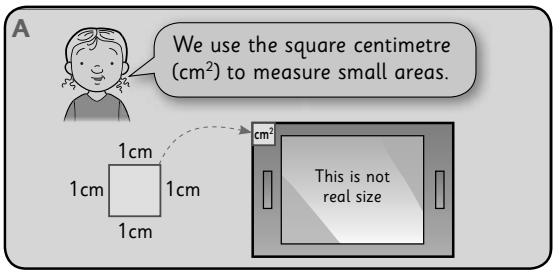
Over the next few days and weeks, your child will be learning about surface area. Your child needs to know the language associated with surface area: area, space, 2-D shape, centimetre square (cm^2), metre square (m^2), perimeter, distance, around, length, width, method, multiply, divide, calculate, total, greatest, smallest.

Note: *Area* is the amount of space covered by a 2-D shape or object.

Perimeter is the distance around the shape.

The square centimetre

A square centimetre (cm^2) has sides that measure 1cm.



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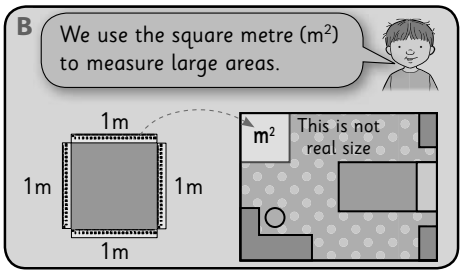
Encourage your child to measure and cut out 10 square centimetres. Using these cm^2, encourage your child to estimate and then measure the surface area of small items around the home, e.g. a photo frame, CD cover, book, chopping board, envelope, mobile phone, stamp, etc.

Notes:

- The 10 square centimetres may be reused several times to complete many tasks.
- If half or more than half of a cm square is used, it should be counted as a full cm^2 in the total. If it is less than half a cm^2, it should not be counted – these usually balance out!

The square metre

A square metre (m^2) has sides that each measure 1m.



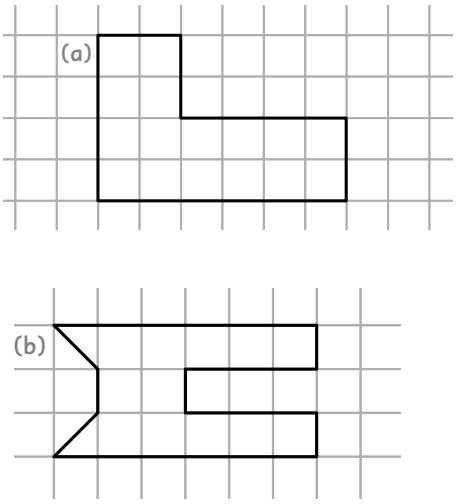
Encourage your child to measure and cut out one square metre of paper (larger sheets of newspaper work best, but A4 sheets of paper sellotaped together will work fine too). Using this m^2, encourage your child to estimate and then measure the surface area of large objects around the home, e.g. the kitchen floor, the patio in the garden, the bedroom floor, the couch, etc.

Note: Answers should be rounded to the nearest m^2, as done with cm^2.

Draw on squared centimetre paper

You will need square centimetre paper for this activity. Your child's teacher could give you a page of this or you could download a template from the internet.

Activity 1: Draw shapes on the cm^2 paper. Encourage your child to calculate the area (space within the shape) and perimeter (distance around the shape) of each shape.



Activity 2: Encourage your child to draw shapes with a specific area, e.g. $15cm^2$. This may take trial and error!

Calculate area quickly

Through exploration at school (and home), your child will discover the rule for quickly calculating the area of rectangles and squares:

length × width **or** width × length

Help your child put this rule into practice. Find a selection of square or rectangular objects around the home, e.g. mobile phone, picture frame, chopping board, bathroom floor, press door. Help your child estimate and then measure the length and width of each object. Finally, invite your child to calculate the area of each object.

Extension 1: Encourage your child to calculate the perimeter of each object.

Extension 2: If a trickier object can be divided into rectangles or squares, your child will be able to calculate the area and perimeter of them.

Percentages 2

Your child received his/her first formal introduction to percentages in Chapter 19. In this chapter, his/her knowledge and understanding of percentages will be increased. Connections will be made between percentages, fractions and decimals. Your child needs to know some of the mathematical language associated with percentages: per cent, percentage, fraction, decimal, units, hundredths, simplify, calculator, horizontal bar-line graph, pie chart, increase, decrease.

Fractions as percentages

Your child should know by now that the word 'per cent' means 'per hundred', so when a fraction is written as hundredths, it is relatively simple to change it to a percentage:

$$\frac{1}{100} = 1\%$$
$$\frac{79}{100} = 79\%$$

Your child has already learned that other fractions can be changed to equivalent fractions (fractions that look different but have the same value) by multiplying by 1 unit (e.g. $\frac{2}{2}$, $\frac{3}{3}$, $\frac{10}{10}$). So by changing a fraction to hundredths, we can easily change them to percentages:

$$\frac{3}{10} \times \frac{10}{10} = \frac{30}{100} = 30\%$$
$$\frac{4}{20} \times \frac{5}{5} = \frac{20}{100} = 20\%$$
$$\frac{3}{4} \times \frac{25}{25} = \frac{75}{100} = 75\%$$
$$\frac{3}{5} \times \frac{20}{20} = \frac{60}{100} = 60\%$$

We can work backwards to change a percentage into a fraction in its simplest terms:

$$70\% = \frac{70}{100} = \frac{7}{10} \text{ (we divided by } \frac{10}{10})$$
$$80\% = \frac{80}{100} = \frac{4}{5} \text{ (we divided by } \frac{20}{20})$$

Decimals as percentages

Once your child knows how to change a fraction to a percentage, changing a decimal to a percentage is easy! We simply change the decimal to a fraction (into hundredths is easiest). Then we can write it as a percentage:

$$0{\cdot}3 = \frac{3}{10} = \frac{30}{100} = 30\%$$
$$0{\cdot}04 = \frac{4}{100} = 4\%$$
$$0{\cdot}86 = \frac{86}{100} = 86\%$$

Find the whole amount

How do we find the whole amount when we are given a percentage of the whole? Example: *40% = €8. What is the whole amount?* Many children find this concept quite difficult, as they are not starting with the whole amount. For this activity, you will need concrete items for sharing, e.g. cubes, counters, marbles or coins. Explain to your child that you have eight cubes in your hand. These eight cubes represent 40% of the whole amount. Explain that you must first change the percentage into a fraction:

$$40\% = \frac{40}{100} \text{ or } \frac{4}{10} \text{ or } \frac{2}{5}, \text{ so } \frac{2}{5} = €8.$$

Share the 8 cubes/counters into two equal piles (as there are $\frac{2}{5}$):

- *How many cubes are in each pile? (4)*
- *Have the cubes been shared equally?*
- *What does each pile represent? Each pile represents $\frac{1}{5}$. There were $\frac{2}{5}$s, as we have split them into two equal piles!*
- *So what is $\frac{1}{5}$ of the whole? Yes, it's 4!*
- *If $\frac{1}{5}$ is 4, what is $\frac{5}{5}$? Yes, $4 \times 5 = 20$.*
- *So the total amount is €20!*

Percentages while shopping

When you go shopping, help your child look out for discounts, e.g. 40% off all jumpers, 50% off all sale items, 10% off all coats. Help your child calculate the sale prices by changing the percentages to fractions and then decreasing the original price accordingly.

Similarly, while grocery shopping, point out percentage increases, such as 20% extra free, 30% more juice and so on. Help your child calculate the total volume on sale by adding on the percentage increase.

Directed numbers

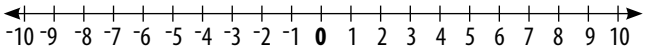
Your child will be learning about directed numbers over the coming days. S/he needs to know the mathematical language associated with directed numbers: negative numbers, minus, positive numbers, plus, degrees Celsius, above, below, under, debit, ago, temperature, ground level, thermometer, freezes, boils, average, hottest, coldest, midday, warmer, colder, December, difference between, highest, lowest, increasing, decreasing, positions, wins, draws, losses, goals for/against, goal difference, won, lost, drawn.

Definitions

A positive number is greater than zero and is written with a positive (+) sign, e.g. $^{+}6$.
A negative number is less than zero and is written with a negative (−) sign, e.g. $^{-}3$.

Number line

Invite your child to count forwards and backwards on a number line similar to the one below. Discuss which numbers have the greater value, e.g. $^{-}3$ or $^{-}8$.



Negative numbers (−) **Positive numbers** (+)

Explain to your child that numbers above 0 are written with a positive (or plus) sign. $^{+}6$ is called positive 6 (or plus 6).

Numbers less than 0 are written with a negative (or minus) sign. $^{-}3$ is called negative 3 (or minus 3).

Try to get your child to say what s/he thinks a number with **no** sign usually means – it is a positive number, e.g. 3 is the same as $^{+}3$.

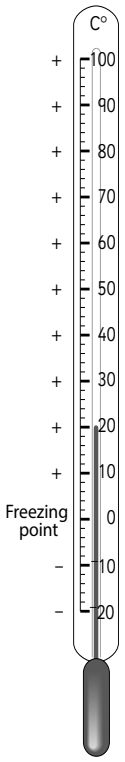
Invite your child to place different numbers on the blank number line, e.g. $^{-}4$, 7, $^{-}9$, 0, 5, $^{-}3$. Allow your child to use the number line to help him/her compare the following pairs of numbers and decide which number is bigger/smaller:

(a) $^{+}7$ and $^{+}4$	**(b)** $^{+}6$ and 0	**(c)** $^{-}6$ and $^{+}6$	**(d)** 3 and $^{+}3$
(e) $^{-}2$ and $^{+}5$	**(f)** $^{-}7$ and 3	**(g)** $^{-}2$ and $^{-}4$	**(h)** $^{+}3$ and $^{-}6$

Temperature

Ask your child what scale temperature is measured in. You can then explain that Celsius (C) is the scale we usually use for measuring temperature. The weather forecast temperatures are given in degrees (°) Celsius (C). 10 degrees Celsius can be written as 10°C.

- Water freezes at 0°C.
- Water boils at 100°C.
- Our average body temperature is 37°C.
- Negative temperatures are below freezing (0°C). Positive temperatures are above freezing.



As negative numbers get bigger, the value is less. Invite your child to offer suggestions as to why this is the case. If necessary, explain, using the number line, that as temperatures get colder, the negative numbers used to describe them get bigger.

Look at the weather chart of Ireland. Discuss with your child which temperatures are above/below zero, which temperature is the coldest/warmest, what the difference is between the temperature in Dublin and Cork and so on. Ask your child: *If the temperatures dropped/increased by 3°C the following week, what would be the temperature of each city then?*

League tables

Examine a soccer league table from a newspaper. Explain to your child that in order to work out a team's total number of points, each team gets 3 points for winning, 1 point for a draw and 0 points for losing. Allow your child to calculate the total number of points for each team on the league table.

Now explain to him/her that if two teams have the same total number of points, the goal difference decides their position on the league table. To calculate the goal difference, you subtract the difference between the goals for (F) and the goals against or conceded (A). Goal difference is used to separate teams with the same number of points.

For example, if Team A, played three matches at home and the scores were, 2–1, 0–4 and 2–3, the team would have 4 goals scored and 7 conceded, giving them a goal difference of $^{-}3$. Allow your child to examine the difference between goals scored and goals conceded.

POS	Team	P	W	D	L	F	A	GD	Pts
1	Crying Monkeys	33	28	4	1	82	16	66	88
2	Happy Bears	33	18	7	8	45	30		
3	Rebel Giraffes	33	19	3	11	55	50		
4	United Birds	33		9		57	40	17	54
5	Flying Tigers	33	15	7	11	40	35	5	52

Your child will be learning about fractions, decimals and percentages over the coming days. S/he will be shown the direct link between fractions, decimals and percentages. This is a vital link that needs to be made. Your child needs to know some of the mathematical language associated with fractions, decimals and percentages: per cent, percentage, fraction, decimal, units, hundredths, round, whole number, simplify, calculator, horizontal bar-line graph, pie chart, increase, decrease, lowest terms, remainders, extra free, kilogramme, reduced, original price, calculate.

Note: All the activities on Sheets 11, 13, 14 and 19 are relevant here as well.

Fractions as percentages

We know that 'per cent' means 'per hundred', so when a fraction is written as hundredths, it's easy to change it to a percentage:

$\frac{4}{100} = 0{\cdot}04 = 4\%$
$\frac{65}{100} = 0{\cdot}65 = 65\%$
$\frac{94}{100} = 0{\cdot}94 = 94\%$

Your child has already learned that other fractions can be changed to equivalent fractions (fractions that look different but have the same value) by multiplying by 1 unit (e.g. $\frac{2}{3}$, $\frac{3}{3}$, $\frac{10}{10}$). So by changing a fraction to hundredths, we can easily change them to decimals or percentages:

$\frac{4}{10} \times \frac{10}{10} = \frac{40}{100} = 0{\cdot}40 = 40\%$
$\frac{7}{20} \times \frac{5}{5} = \frac{35}{100} = 0{\cdot}35 = 35\%$
$\frac{1}{4} \times \frac{25}{25} = \frac{25}{100} = 0{\cdot}25 = 25\%$

Once the denominators (numbers on the bottom of a fraction) are the same, we can add or subtract them, as done earlier. The children are always encouraged to simplify their answers to the smallest fraction:

$20\% = \frac{20}{100} = \frac{2}{10} = \frac{1}{5}$
$75\% = \frac{75}{100} = \frac{3}{4}$
$35\% = \frac{35}{100} = \frac{7}{10}$
$60\% = \frac{60}{100} = \frac{3}{10}$
$85\% = \frac{85}{100} = \frac{17}{20}$
$35\% = \frac{35}{100} = \frac{7}{20}$
$36\% = \frac{36}{100} = \frac{9}{25}$

Find a percentage of the whole

You will need concrete items for sharing, e.g. cubes, counters, marbles or coins. Explain to your child that you have 40 cubes in your hand and you want to give 60% of them to him/her. Explain that in order to find a percentage of a number, you must change the percentage into a fraction in its lowest possible terms: $60\% = \frac{60}{100}$ or $\frac{6}{10}$ or $\frac{3}{5}$, so we must find $\frac{3}{5}$ of the 40 cubes. Share the cubes equally into 5 piles until they are all gone. Ask your child questions such as:

- *How many cubes are in each pile? Yes, 8!*
- *Have the cubes been shared equally?*
- *So what is $\frac{1}{5}$ of 40? Yes, it's 8!*
- *If $\frac{1}{5}$ is 8, what is $\frac{3}{5}$? Yes, $8 \times 3 = 24$!*

The quick method:

$\frac{5}{5}$ = 40 coins
$\frac{1}{5}$ = 8 coins
$\frac{3}{5}$ = 24 coins

Percentage (%) extra free

When you are out shopping, show your child some of the offers that the shop or supermarket is making and try to get him/her to work out the saving, if any.

The bananas were on sale at four for €1. There is now one banana extra free.

Ask questions such as:

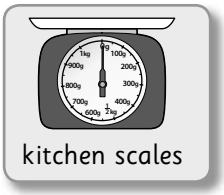
- *How many bananas were on sale at first?*
- *What was the cost of each banana? Yes, 25c.*
- *What is the percentage extra now? Yes, 25%.*
- *What is 25% as a fraction? Yes, $\frac{1}{4}$.*
- *What is $\frac{1}{4}$ of 4? Yes, 1.*
- *How many extra bananas are in the bunch now? Yes, 1.*
- *How many bananas are there now? Yes, 5.*
- *What is the cost of each banana? Yes, 20c.*
- *What is the saving on each banana? Yes, 5c.*

Do this type of exercise with as many items as you can, but make sure the numbers being used aren't too big.

Weight

Your child will be dealing with the metric system – weight – over the coming days. S/he will learn about units of measure including the gramme (g) and kilogramme (kg). S/he will be learning how to express these grammes as both fractions and decimals of a kg in line with the work done earlier on fractions, decimals and percentages. S/he will learn about different tools and instruments for weighing a range of items. S/he will learn how to add, subtract, multiply and divide units of weight, weigh objects and solve real-life problems involving weight. S/he needs to know some of the mathematical language associated with weight: grammes, kilogrammes, fractions, decimals, weight, approximate, estimate, measure, addition, subtraction, multiplication, division, kitchen scales, balance, bathroom scales, spring balance, livestock scales, weigh bridge.

Kitchen scales


kitchen scales

Use a traditional kitchen scales if possible for the following activity. Help your child to explore and understand the markings on the scales.

Ask questions such as:

- *What is the heaviest weight that is marked on this scales?*
- *How many grammes are in 1kg?*
- *How many grammes are in $\frac{1}{2}$ kg?*
- *How many grammes must I add to $\frac{3}{4}$ kg in order to have a full/complete 1kg?*

Extension 1: Using the scales, encourage your child to weigh a selection of household objects, e.g. an orange, pear, eight strawberries, book, cup, egg cup, pot of jam, tin of peas, four bananas. Encourage your child to estimate the weight before placing the items on the scales.

Extension 2: Ask your child to determine the difference in grammes between his/her estimate and the actual weight using the scales.

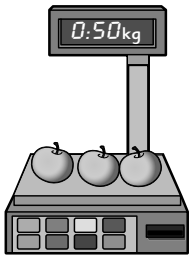
Extension 3: Encourage your child to write the weights as fractions and decimals, for example:

1g	=	$\frac{1}{1000}$ kg	or	0·001kg
24g	=	$\frac{24}{1000}$ kg	or	0·024kg
600g	=	$\frac{6}{10}$ kg	or	0·6kg
1,273g	=	$\frac{1273}{1000}$ kg	or	1·273kg

Baking

Together with your child, follow a simple recipe to bake an item of your choice, e.g. healthy banana muffins, bread, a cake, gingerbread. Encourage your child to measure the different ingredients needed using a traditional kitchen scales or a digital scales.

Shopping trip



Bring your child to the supermarket. When picking out fruit or vegetables, encourage your child to estimate the weight of specific items, e.g. a bunch of bananas, three apples. Let your child weigh the items and place the stickers on the fruit and vegetables (acceptable in most stores).

Extension 1: Ask your child to determine the difference in grammes between his/her estimate and the actual weight.

Extension 2: Weight is labelled on most supermarket products. Ask your child to find items in the shop that weigh specific amounts, e.g. 1kg, 550g, less than 200g.

What is the cost of 1kg?

When you get back from your shopping trip, give your child the shopping receipt. Ask him/her to compare the price of a certain item, e.g. a tin of tomatoes, with the weight of the item. Help your child to calculate the cost of 1kg of that specific item, for example:

400g	=	40c
100g ($\frac{1}{10}$)	=	10c
1,000g ($\frac{10}{10}$)	=	€1

Your child could use a calculator for this activity, as it is more about the concept than the calculation.

Do this with a number of items.

Your child will be learning about number theory over the coming days. Your child needs to know the mathematical language associated with it: factors, divisors, product, related pairs of factors, true, false, whole number, divide, even, odd, multiples, prime numbers, composite numbers, divisible, remainder, exactly, sum of, digits, divisibility tests, difference between, inclusive, total, subtracted, answer, rectangular number, rectangle, triangular number, triangle, pattern, diagram, square number, square, multiplied, calculate, consecutive, area, dimensions, length, width, number sentence, rectangular arrays.

Factors/divisors

Factors are whole numbers that are multiplied to get a product. Factors are also called *divisors*, as the factors of a number are the numbers that will divide exactly into that number.

What's the product?

Call out a random series of products for each separate multiplication table and ask your child to give the correct factors. For example, if you call out the product 24, your child could offer 8 and 3 as factors. Your child gets 1 point. S/he could offer other factors for the product 24 to gain more points in a game, e.g. $2 \times 12 = 24$ or $6 \times 4 = 24$. Now swap roles, with your child taking a turn to call out a different product and you must offer factors. The player with the most points at the end of the game is the winner.

Make rectangles

Invite your child to make rectangles of various sizes using 12 squares on squared paper (sums copy paper). Your child should make rectangles with the following dimensions: 1×12, 2×6 and 3×4. Now invite him/her to list the factors of 12: 1, 2, 3, 4, 6 and 12. Continue finding factors as above for different numbers, e.g. 15, 18, 21, 24, 30, 36, 48.

Factor mania

This game can be played by two or more players. Player A puts a red X on any number s/he wishes on the factor mania board, e.g. 24.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
32	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Player B has to place counters on as many factors of 24 as possible: 1, 2, 3, 4, 6, 8, 12, 24.
Player B adds the total of all the factors s/he has covered. That is his/her score for that round, e.g. $1 + 2 + 3 + 4 + 6 + 8 + 12 + 24 = 58$.

Player B now puts a blue X on any number s/he wishes on the Factor Mania board other than one that has already been used, e.g. 18. Now it is Player A's turn to place a counter on all the different factors of that number, e.g. 1, 2, 3, 6, 9, 18. Similiarly, Player A adds the total of all the factors s/he has covered and that is his/her score for that round ($1 + 2 + 3 + 6 + 9 + 18 = 49$).

Each player gets five turns. The winner is the player who has the highest total at the end of the five rounds.

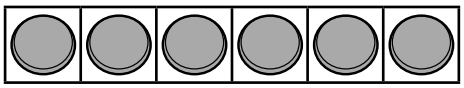
Note: The highest number with factors that can be used is 50. Some big numbers will have relatively few factors, but their totals may be high!

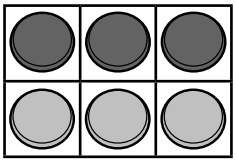
Multiples

Invite your child to group cubes into sets of six. Invite him/her to count the total number of cubes by skip counting in 6s. Explain to him/her that these numbers (6, 12, 18, 24, 30, etc.) are multiples of 6. This activity can also be done with all the multiplication tables from 1 to 10.

Rectangular numbers

Explain to your child that a rectangular array is an arrangement of objects in rows and columns that forms a rectangular shape. Ask your child to draw rectangular arrays for various numbers, e.g. 1, 2, 3, 4. All prime numbers have only one rectangular array, e.g. 1×2, 1×3, 1×5, 1×7, 1×13, 1×23. Composite numbers will have at least two rectangular arrays, e.g. 6:



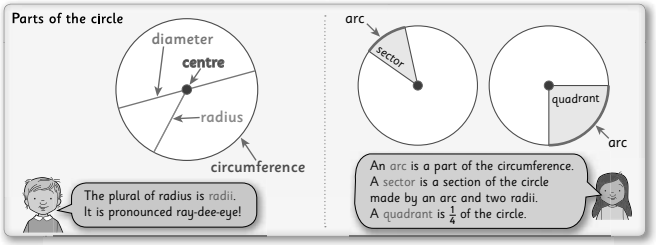


Note: A prime number has only itself and 1 as factors. Numbers that have more than two factors are called composite numbers.

The circle

Your child will be learning about the circle over the coming days. This will be done in much greater detail than in the chapter about 2-D shapes. Your child needs to know the mathematical language associated with the circle: circle, centre, circumference, radius, radii, diameter, sector, quadrant, arc, straight lines, perimeter, one-quarter, right angle, straight angle, protractor, length, shorter, combined, compass, ruler, swivel, point, estimate, area, centimetre squares, approximate, full, half, more, less, construct, cost, discount, pattern, continue, small, medium, large, extra large.

Properties of a circle



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Label the circle

This activity works well if you have a regular paper plate. Have your child label the different properties of the circle on the plate.

Notes:

- A circle can have many **radii** (radii is the plural of radius). Each radius is identical in length.
- The **diameter** divides a circle in half. The diameter must pass through the centre of the circle. A circle can have many diameters.
- The **circumference** is the correct name for the perimeter (outline) of a circle.

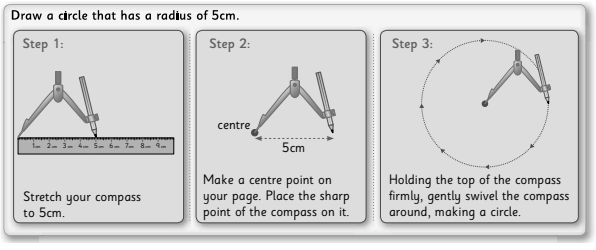
Circle hunt

Go on a short circle hunt with your child and search for as many different circles as you can around the home, e.g. CD, plate, mirror, clock, bowl, cup, saucer, saucepan, vase.

Extension 1: Help your child measure the radius and diameter of each circle that you find.

Extension 2: Encourage your child to trace around the different circular objects to create 2-D circles.

Use a compass



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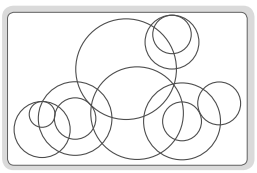
Many children find it difficult to use a compass. Help your child use a compass by giving him/her the following instructions:

1. Place a sharpened pencil into a compass and secure it tightly.
2. Stretch the compass as wide as you wish. This will be determined by the length of the actual radius.
3. Place a small amount of pressure on the point of the compass.
4. Pinching the top of the compass with your thumb and index finger, swivel the compass around, drawing a circle.
5. The point of the compass must remain stationary at all times.

Activity 1: Encourage your child to draw circles of different radii/diameters, e.g. 4cm, 5cm, 5½cm.

Activity 2: Invite your child to make interesting circle patterns and pictures, similar to the ones shown here.



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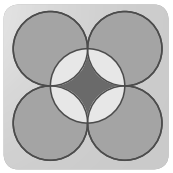

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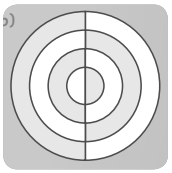
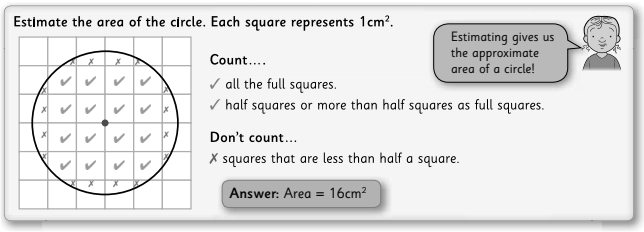


Approximate area of a circle

Encourage your child to draw circles onto centimetre square paper (a normal sum copy will work and each small square can represent one square centimetre: 1cm^2). To find the approximate area, ask your child to simply count all the full squares. S/he should also count all the ones that are at least half a square as a full square.



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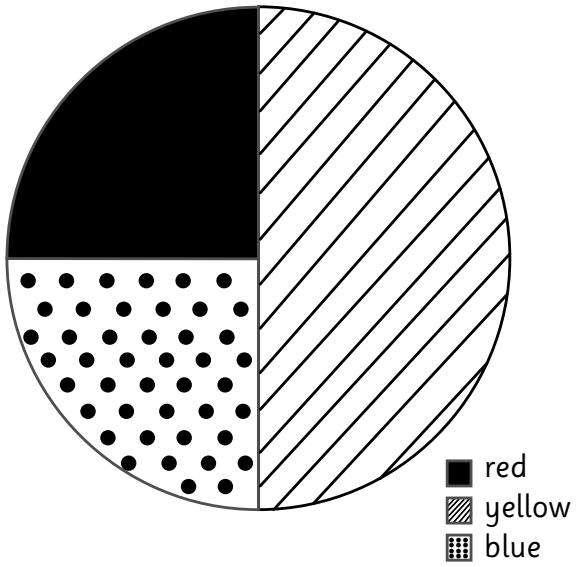
Data 3 – Pie charts

Your child will be learning how to represent and interpret data and construct pie charts over the coming days. S/he will need to know the language associated with data: pie chart, favourite, survey, data, represent, fraction, vote, altogether, key, percentage, calculate, degrees, sector (slice like a pizza), fraction, compare, protractor.

What are pie charts?

- Pie charts provide information at a glance.
- Pie charts look like pies (circles) cut into different slices. Each slice is called a sector.
- Each sector is a fraction of a circle.
- Each sector also forms an angle within the circle. Angles are measured in degrees, so each sector represents a certain number of degrees.
- There are 360 degrees in a full circle.
- Each sector is usually given a different colour. The colour is always explained in a colour key that is supplied in the chart.

Look at this pie chart of favourite colours and ask your child the questions below:



- *How many sectors (slices) are in the circle?*
- *What section is represented by the colour black?*
- *What fraction of people voted for black/stripes/dots?*
- *How many degrees are represented by the black/stripes/dots?*
- *If 80 people voted in the survey, how many people voted for black/stripes/dots?*

Search for pie charts

Look for examples of pie charts in magazines, newspapers and online (all work online should be done under supervision). Discuss and examine them with your child.

Ask questions such as the following:

- *What is the title of the pie chart?*
- *How many sectors/slices are there?*
- *What categories are represented?*
- *Which category is largest/smallest?*

Construct a pie chart

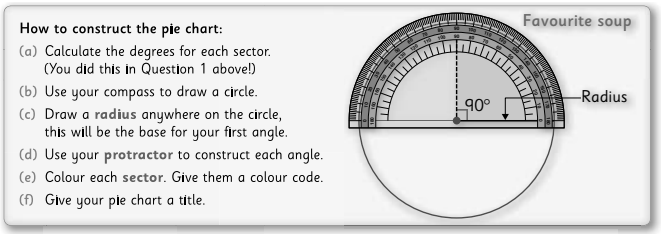
To construct a pie chart, your child must calculate how many degrees will be in each sector. Look at the following example.

Soup	Vegetable	Chicken	Tomato	Potato and Leek
Votes	15	20	10	15
Fraction	$\frac{1}{4}$			
Degrees				

To calculate the degrees, we must:

1. Calculate the total number of votes (15 + 20 + 10 + 15 = 60).
2. Place the number of votes for each category over the total to find the fraction who like soup, e.g. vegetable soup $= \frac{15}{60} = \frac{1}{4}$.
3. Calculate how many degrees are in $\frac{1}{4}$ of a circle. As there are 360 degrees in a circle, just divide by 4 = 90 degrees.

Now help your child calculate the fraction and degrees for the remaining three soup flavours.


How to construct the pie chart:
(a) Calculate the degrees for each sector. (You did this in Question 1 above!)
(b) Use your compass to draw a circle.
(c) Draw a **radius** anywhere on the circle, this will be the base for your first angle.
(d) Use your **protractor** to construct each angle.
(e) Colour each **sector**. Give them a colour code.
(f) Give your pie chart a title.
Favourite soup
90°
Radius

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Once you have calculated the degrees, constructing the pie chart is easy!

1. Draw a circle (using a compass).
2. Draw a radius anywhere on the circle. Use this as the base for your first angle (sector).
3. Using a protractor, draw your first angle.
4. Continue drawing all the angles until the pie chart is complete.

Equations

Your child will be learning about equations over the coming days. S/he needs to know the mathematical language associated with equations: numerals, symbols, number sentences, equal to, has the same value as, balance, tilt, scales, word problem, number sentence, true, false, correct, incorrect, answer is, add, subtract, measure, greatest number, less than, greater than, equation, the same value, fractions, decimals, unknown part, percentages, closed sentence, open sentence, operation sign, metres, minutes, original price, reduction, sale price.

Note: The equals sign (=) is a mathematical symbol used to show equality. The equals sign is placed between two amounts that have the same value, for example:

$4 + 3 = 7$ $6 \times 5 = 30$ $4 + 5 = 3 \times 3$

Closed or open?

A closed number sentence has **no unknown** (missing) parts. It can be true or false.

True closed number sentence: $7 \times 3 = 21$.
False closed number sentence: $7 \times 4 = 21$.

An **open** number sentence has an **unknown** part. We use a frame ◯ to represent the unknown part. An open sentence can be either true or false.

- Write various number sentences, some with unknown parts represented by ◯.
- Invite your child to state whether the number sentences are closed or open, for example:
  (a) $4 + 6 = 10$ **(b)** $12 - 9 = \bigcirc$ **(c)** $24 - 18 = 6$
  (d) $18 + 4 = 24$ **(e)** $4 + \bigcirc = 7$ **(f)** $9 \times 4 = \bigcirc$

See question 1 on page 156 of the textbook for more examples.

- Display various closed number sentences.
- Ask your child to determine which ones are true and which ones are false and to explain his/her reasoning.

Which sign?

Display various open number sentences with the **>** (greater than), **<** (less than) or **=** signs missing, for example:

(a) $4 + 3 \bigcirc 8$ **(b)** $5 \times 4 \bigcirc 20$ **(c)** $12 - 3 \bigcirc 10$

See questions 3 and 4 on page 156 of the textbook for more examples. Invite your child to determine which sign makes each number sentence true. S/he must also explain his/her reasoning.

For this activity and the following activities, you could make blank digit card holders and sign holders on Post-it notes or small squares of paper about 3cm square.

+	–	<	>	=

Example: Ask your child to write the number sentence/ equation as follows using the digit cards and the signs.

16	–	1	<	18
3	x	5	=	15

Mystery number

Call out various number sentences for your child, as follows (make it into a fun game): *I am thinking of a number. I add 4 to it. My answer is 12. What is my number?* As you are calling out the question, your child can be filling in the number sentences in his/her copy or on a sheet of paper. When s/he has worked out the answer, s/he should explain and justify his/her reasoning.

Which operation?

Write various number sentences for your child but leave out the operation sign (**+**, **–**, × or ÷). Your child must work out the correct operation sign to make each number sentence true/correct. S/he works out the answer and justifies his/her reasoning, for example:

(a) $12 \bigcirc 8 = 20$ **(b)** $50 \bigcirc 30 = 20$ **(c)** $21 = 3 \bigcirc 7$

Invite your child to give the number sentence as a word problem. For example, $12 \bigcirc 8 = 20$ could become: *Seán bought 12 bananas and Rose bought 8. They bought 20 bananas between them.*

Note: It is very important that your child can translate number sentences into word problems.

The missing number

Write various number sentences for your child, but this time leave out one of the numbers. Your child must work out the missing number to make each number sentence true/correct, for example:

(a) $14 + 1 = 30 - \_\_\_\_$ **(b)** $81 \div 9 = 5 + \_\_\_\_$

S/he must be able to work out the answer and justify his/her reasoning. Invite your child to translate the number sentences into word problems (a few different word problems, if possible).

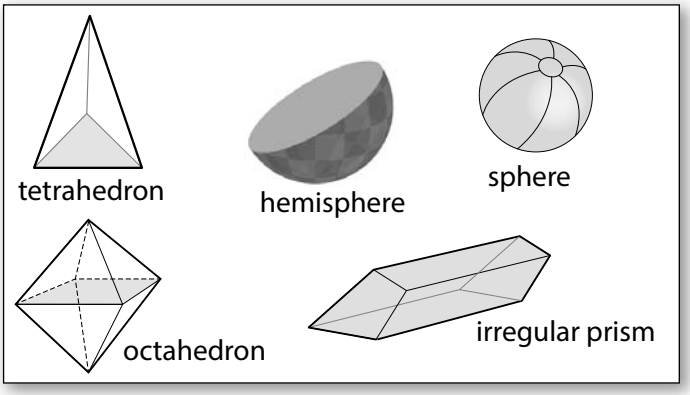
3-D shapes

Your child will be learning about 3-D shapes over the coming days. This will be done by means of games and activities using concrete materials. Your child will need to know the language of 3-D shapes: length, width, height, flat, solid, stack, regular, irregular, corners, forms, edges, vertex, vertices, skeleton, apex, tetrahedron, prism, polygon, pyramid, hemisphere, polyhedron, polyhedra.

Notes for parents

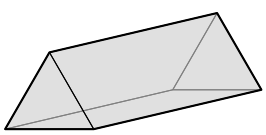
- 3-D shapes have three dimensions: **length**, **width** and **height**.
- Width is also commonly known as **breadth**.
- 3-D shapes are solid and can be held.
- 2-D shapes are flat, therefore they cannot be held.
- A vertex is a corner of a 3-D shape. The plural of the word vertex is **vertices**.
- The vertex at the top of a pyramid has a special name: **apex**.
- There is considerable international debate concerning edges and faces of 3-D shapes. Some educationalists believe that faces and edges can only be flat (which would mean that a sphere has no face). Throughout the *Busy at Maths* series, we assert that a face/edge can be flat or curved. Using this logic, a sphere has one curved face.

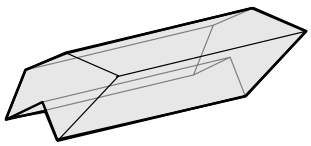
New shapes introduced in 5th Class



Notes about these shapes:

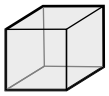
- A **tetrahedron** is another name for a triangular pyramid.
- A **hemisphere** is half of a sphere.
- **Prisms** have straight sides only. They are named after the 2-D shape of their bases.
- If the base of a prism has sides of different length, the prism is said to be **irregular**.
- An **octahedron** is formed by joining two square pyramids, with the two square sides joined together.

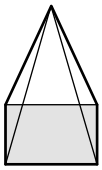

regular prism

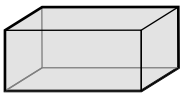

irregular prism

Polyhedra

A **polyhedron** is any 3-D shape made up of straight sides and flat faces. Each of the following is a polyhedron.


cube


square pyramid


cuboid

Exploring 3-D shapes

Investigate the following 3-D shapes: cube, cuboid, cylinder, sphere, triangular prism, square pyramid, tetrahedron, pentagonal prism, cone, hemisphere, octahedron, irregular prisms. Examine and explore 3-D shapes with your child by asking questions such as:

- *How many faces does a cuboid have? Name them.*
- *How many vertices does a cube have?*
- *Name a 3-D shape that has a curved face.*
- *Name a 3-D shape that is not a polyhedron.*
- *How many edges does a triangular prism have?*
- *Which of the 3-D shapes can roll?*
- *Name something in the home that is shaped like a cylinder.*

Extension 1: With your child, find examples of the different prisms and pyramids around the home or local environment.

Extension 2: Ask your child to use the internet (under supervision) to search for examples of prisms and pyramids (and all the other 3-D shapes) in real life.

Rules and properties

Your child will be learning about rules and properties over the coming days. S/he needs to know the mathematical language associated with rules and properties: copy, extend, devise, predict, pattern, repeated pattern, vertical, horizontal, life cycle, rough, smooth, 10th/15th element of the pattern, days of the week chart, months of the year chart/calendar, months of the year, seasons, before, after, money, coins, 2-D shapes (circle, square, rectangle, triangle, hexagon, semi-circle, oval, rhombus, pentagon, octagon), 3-D shapes (cube, cuboid (e.g. cornflakes box), cylinder, cone, sphere, triangular prism, pyramid), what is the rule?, enter, sequence, hundred square, odd, even, calculator, language of ordinal number, rows, columns, number bonds, digits, palindromes (words or numbers that read the same forwards and backwards, e.g. Navan), forwards, backwards, multiples, strategy, sequence, number facts.

Order of operations

Invite your child to solve the following: $3 + 8 \times 6 - 2$. The correct answer is 49, as the multiplication must be done first. Discuss other possible solutions to the above, e.g. 64, 53. Invite your child to explain why there are different answers. Tell your child that long ago, mathematicians came up with the order in which we solve the different operations in an equation to ensure that everyone got the same, correct answer.

This will help you remember the order –
Boats **M**ay **D**rift **A**t **S**ea:

Brackets first followed by
Multiplication/**D**ivision (left to right) followed by
Addition or **S**ubtraction (left to right).

Example 1: Brackets first!
$(5 \times 6) - 4 = 30 - 4 = 26$ ✔
$(5 \times 6) - 4 = \ 5 \times 2 = 10$ ✗

Example 2: Multiply or divide before adding or subtracting!
$60 - 5 \times 7 = 60 - 35 = 25$ ✔
$60 - 5 \times 7 = 55 \times \ 7 = 385$ ✗

Example 3: Multiplication and division rank equally, so the order is from left to right where they appear together!
$60 \div 5 \times 3 = 12 \times \ 3 = 36$ ✔
$60 \div 5 \times 3 = 60 \div 15 = 4$ ✗

Stages of development in exploring patterns

- Children copy patterns.
- Children extend patterns.
- Children devise patterns.

What is missing?

Devise a pattern with your child using any material you have at home, e.g. pasta shapes, coloured clothes pegs, socks. Invite your child to close his/her eyes. Remove one item from the pattern and ask your child to decide what is missing and to explain his/her reasoning.

Pattern detective

Ask your child to examine patterns from your own home or local environment, e.g. wallpaper, gift-wrapping paper, socks, striped jumpers. Discuss the pattern and draw attention to the way it is repeated.

Patterns everywhere!

Have fun copying, extending and devising the following patterns. Always invite your child to say what comes next.

- **P.E.:** Long step, jump, short step…; clap hands, touch knees, touch toes…
- **Visual Arts:** Paint a matchbox to make patterns, e.g. vertical, horizontal, vertical…; parallel, perpendicular, parallel…

Extension 1: Design a necklace with three to four different-coloured beads.

- **Nature:** Ask your child to research the life cycle of animals (e.g. frog, butterfly) on the internet under supervision.
- **Science:** Use rough and smooth materials to make rough, smooth, rough, smooth… patterns.

Extension 2: Display various number patterns for your child, e.g. 8, 16, 24, 32, 40, 48… Invite him/her to close his/her eyes. Now cover one item in the pattern. Your child must decide what number is missing and explain his/her reasoning.

Money patterns

Materials required: 5c, 10c, 20c, 50c, €1 and €2 coins

Your child can copy, extend and devise patterns with the 5c, 10c, 20c, 50c, €1 and €2 coins.

Extension: Your child can try to predict what the 10th/15th/etc. coin will be in the pattern that has been made.

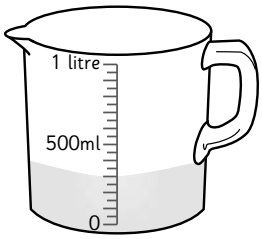
Your child will be learning about capacity (the measure of the amount of liquid that a container can hold) over the coming days. S/he needs to know some of the language of capacity: capacity, container, litre (l), millilitre (ml), estimate, measure, fractions, decimals, change, graduated jugs, addition, subtraction, multiplication, division, volume, identical.

The litre jug

$1\text{ml} = \frac{1}{1000}\text{l} = 0{\cdot}001\text{l}$

$10\text{ml} = \frac{1}{100}\text{l} = 0{\cdot}01\text{l}$

$100\text{ml} = \frac{1}{10}\text{l} = 0{\cdot}1\text{l}$



Help your child practise reading the litre in both fraction and decimal form from the graduated jug, for example:

- *How many millilitres are in 0·2l?*
- *What is another name for $\frac{5}{10}$l?*
- *How many millilitres are in $\frac{7}{100}$l?*
- *What is 420ml in fraction and decimal form?*
- *How many millilitres are in $\frac{62}{1000}$l?*
- *How many millilitres are in 0·84l?*

Use a measuring jug

For this activity, your child will need a measuring jug, water and containers of different shapes and sizes. Ask your child to measure different amounts of water, *e.g. Pour 100ml / $\frac{2}{5}$l / 0·5l / 300ml /850ml into the jug.*

After measuring a specific amount of water (e.g. 500ml), invite your child to pour the water into a selection of containers of different shapes and sizes. This will demonstrate to him/her that 500ml can look very different in a large, wide container as opposed to a tall, narrow container. Some children think that tall, narrow containers contain more than small, wide containers.

What is the capacity of this container?

For this activity, find a selection of containers used in your home e.g. bowl, cup, spoon, jug, pot, kettle, jar, butter tub, shampoo bottle. Remove any labelling that might show the capacity of the container. Invite your child to estimate the capacity of each container. Then, using water and a measuring jug, encourage your child to measure the exact capacity of each container. Discuss how far/close his/her estimates were to/from the actual measures.

What does 200ml look like?

For this activity, you will need water, a measuring jug and a selection of containers from around your home. Pour 200ml into a measuring jug to show your child what it looks like. Now challenge your child to fill each container in front of him/her with what s/he thinks is 200ml – this is very tricky but your child will have good fun trying! 200ml will look very different in a kettle as opposed to in a bowl. When your child has finished, ask him/her to pour the liquid from each container into the empty measuring jug to assess how close each estimate was to the real measure.

Cooking and baking at home

Capacity measurements regularly appear in recipes. When you need to measure liquids in the home, encourage your child to complete the task for you, e.g. *Measure 280ml of milk/water, etc.*

Container hunt

Encourage your child to find a household container that holds between 100ml and 200ml of water. Use a jug and water to verify the answer.

Extension: Extend the search by looking for containers that hold different capacities, e.g. 300–500ml, about 1 litre, 800ml and so on.

Shopping trip

Bring your child to the supermarket. When picking out liquids, encourage your child to estimate the capacity of specific items, e.g. carton of milk, bottle of orange juice. Then compare the difference between his/her estimate and the actual capacity.

What is the cost of 1l?

When you get back from your shopping trip, give your child the shopping receipt. Ask him/her to study the price of a certain item, e.g. 90c for a 300ml bottle of sauce. Help your child calculate the cost of 1 litre of that specific item, for example:

300ml = 90c
100ml ($^1/_{10}$) = 30c
1,000ml ($^{10}/_{10}$) = €3·00

Your child could use a calculator for this activity, as it is more about the concept than the calculation.

Do this with a number of items.

Your child will be learning about chance (probability) over the coming days. S/he has already been introduced to chance in 3rd and 4th Classes. Probability or chance is a measure of the likelihood of a particular event actually taking place. Your child will need to know the language associated with chance: possibility, likelihood, probability, chances, impossible, likely, unlikely, possible, even chance, tails, heads, coin, spinners.

The language of chance

Focus your child's attention on the language of chance. If your child can come up with statements of his/her own about each of the following words, then s/he has a good understanding of them.

- **Possible:** It is possible that Dad will wash the dishes this evening.
- **Impossible:** It is impossible that I can jump and touch the sun.
- **Likely:** It is likely that I will get homework next Tuesday.
- **Unlikely:** It is unlikely that it will snow in June.
- **Certain:** It is certain that the sun will rise in the east tomorrow morning.
- **Even chance:** There is an even chance that I will get heads when I toss a coin.

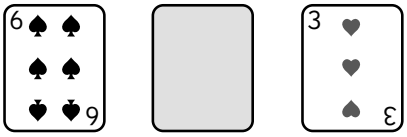
Coin toss

To play this game, you need a €1 coin (or any coin will do). Discuss the chances of the coin landing on tails (the side with the harp) or heads. Explain to your child that this represents an even chance or a 50/50 chance (50% for each). Either outcome is just as likely to occur. Challenge the odds by tossing the coin 10 times. What results did you get? Now toss the coin 50 times and see if the outcome remains the same or changes. Remind your child that there is very little certainty when it comes to chance!

Game 1: The mystery card

Place three cards on the table, the first one face-up, the second face-down and the third face-up. The card in the middle (face-down) is the mystery card.

The player must predict whether the mystery card will lie somewhere between the values of the two overturned cards or lie outside this range of values. If the prediction is correct, s/he gets a point (counter). If the prediction is incorrect, the dealer wins the point (counter). Whichever player has most counters after a specified number of turns is the winner.



Game 2: Beads in a bag

For this game, you will need some beads, counters or cubes. Encourage your child to use the language of chance as outlined above during this game. Get a bag or box. It is important that your child cannot see inside the bag or box. Place 10 coloured beads or cubes into the bag or box: five blue, three red, one yellow and one green. Explain that you are going to pick one bead out of the bag or box at random. Discuss the possible outcomes, asking questions such as:

- *Am I certain to pick out a blue bead? (No.)*
- *Is it possible that I will pick out a red bead? (Yes.)*
- *Is it likely or unlikely that I will pick a red bead? (It is possible, but it is more unlikely than likely.)*
- *Is it possible that I might pick out a black bead? Why? (No, it is impossible.)*
- *Which two colours have an even chance of being pulled out?*

Extension: Play the game using different colour combinations of beads.

Snakes and ladders

Play the traditional snakes and ladders board game with your child. As you play, discuss the role played by chance in the game: players have an equal chance of winning, but each roll of the die has different outcomes. You might land on a snake or a ladder – it's all about luck!