Revision

Your child will be revising some of the work done in 5th Class (pages 1–6) on the numerals/numbers 0 to 99,999; addition and subtraction of numbers with totals to 99,999; fractions (halves through to twelfths); recognise and name 2-D shapes (semi-circle, rhombus, pentagon, hexagon, octagon, parallelogram and trapezium); recognise and name 3-D shapes (square pyramid, cone, triangular prism, cylinder, octahedron and tetrahedron); recognise and name acute, obtuse, straight and reflex angles; recognise place value to 99,999; read the time in one-hour, half- and quarter-hour as well as in five- and one-minute intervals in both analogue and digital forms; add and subtract hours and minutes and write metric units in fraction and decimal form over the coming days. Your child needs to know the mathematical language associated with the numerals 0 to 99,999: 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/quarter past/to, etc. The following are a few ideas that may help to get your child on the right road to enjoying mathematics.

3-D shapes

Ask your child to find something around the house or local environment in the shape of a cone (funnel, ice cream, traffic cone), cylinder (tins of beans, peas), triangular prism (Toblerone box), square pyramid (candle, tent, paperweight), tetrahedron (juice containers) and octahedron (crystals, spinning tops, charms on bracelets). Talk to your child about the number of faces/vertices (corners) or edges that are on each shape.

2-D shapes

Be sure to emphasise that 2-D shapes cannot be held. They are only pictures/symbols – they don't have any depth. Encourage your child to make 2-D shapes by drawing around a side of its corresponding 3-D shape. For example, place a cuboid (cereal box) on a piece of A4 paper. If your child traces around the side, s/he will be left with different rectangles. Ask your child to find something in the shape of the 2-D shapes (rhombus, pentagon, hexagon, octagon, parallelogram and trapezium) around the house or local environment, e.g. picture frames, window pane, panel in a door, calendar, tabletops, goal nets, top of a pencil, floor/wall tiles.

Multiply a decimal number

Revise rounding of decimal numbers to the nearest whole number with your child. For example, ask: Is €14·35 nearer to €14 or €15? Is €21·85 nearer to €21 or €22? Is €86·51 nearer to €86 or €87?

Multiply a decimal number (to two places) by a one-digit number

Pose a problem: *If a magazine costs €14·35, estimate how much six magazines would cost.*

Elicit from your child that €14 × 6 = €84. Now invite your child to work out the actual answer to €14·35 × 6 using the short multiplication method. S/he should get 8610 (ignore the decimal point for now).

Discuss with your child where the decimal point should go and allow him/her to justify the answer. The options are €0·861, €8·61, €86·10 or €861·0. The correct answer must be €86·10, as the estimate was €84.

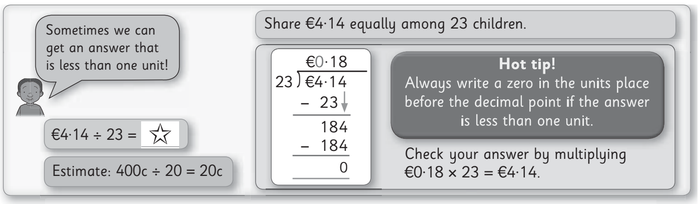
It is essential that your child always estimates first (by rounding) to find the answer to a multiplication problem involving decimals. After carrying out the procedure, it is crucial that s/he compares the answer to the original estimate.

Long division

Pose the following problem:
Share €4·14 equally among 23 children.

Note: Encourage your child to estimate the answer first by rounding to the nearest whole number, e.g. 400c ÷ 20 = 20c.

Ask your child to represent €4·14 using money. Invite him/her to discuss the value of each digit:
€4·14 = €4 + 10c + 4c.



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Explain: *€4 divided by 23, I cannot do. Therefore, I must rename the €4 + 10c as forty-one 10c pieces. 41 groups of 10c divided into 23 equal parts = 1 time with eighteen 10c pieces left over. Rename the eighteen 10c pieces as 184c (18 × 10c + 4c). 184c divided into 23 equal parts equals 8 times.*
So, €4·14 ÷ 23 = 18c.

Place value to 999,999

Your child will be learning about *place value* to 999,999 and beyond over the coming days. S/he needs to know the mathematical language associated with place value: millions, hundred thousands, ten thousands, thousands, hundreds, tens, units, group of, sets of, bundles of, cubes, lollipop sticks, loose, place holder, count, match, after, before, between, less than, more than, odd, even, rows, columns, equals, tens, plus, add one more, take away, count forwards, count backwards, millions house, hundred thousands house, ten thousands house, thousands house, hundreds house, tens house, units house, swap, regroup, exchange, add, show most, show least, odd, even, digits, estimate, represents.

Clap, tap

Invite your child to count in hundred thousands from different starting points between 0 and 999,999. For example, start counting in hundred thousands from 0, 100,000, 320,246, 408,237, etc. As s/he says each hundred thousand, invite your child to alternate from clapping his/her hands to tapping his/her feet. For example, 230,246 (clap hands), 330,246 (tap feet), 430,246 (clap hands), 530,246 (tap feet).

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

Mystery number

Think of a number between 0 and 1,000,000.

Your child must ask questions in order to find out what the number is, but you can only reply giving 'yes' or 'no' answers. Your child must ask at least five questions before s/he can guess what the mystery number is. For example:

- *Is it less than 500,000? Is it an even/prime/composite/square/triangular number?*
- *Does it have more than 3 hundred thousands/6 ten thousands/4 thousands/9 hundreds/2 tens/9 units? Is the thousands digit greater than the units digit?*
- *Is the hundreds digit greater than the hundred thousands digit? And so on.*

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

Playing card lotto

For this game you will need a deck of cards, only using cards 1–9 (the ace card = 1). It can be played by two to five players. Each player gets a pile of seven cards and turns them face up on the table. They arrange the seven cards to make the biggest number possible. They call out, in turn, the number they have made. For example, if a player turns over a 5, 4, 6, 5, 2, 3 and a 1 (ace), the biggest number s/he can make is 6,554,321. Whichever player is showing the biggest number wins a cube/counter/coin. Shuffle the cards and give each player seven new cards to continue the game as above. Play continues until one player wins five cubes/counters/coins and is the winner.

Roman numerals

Your child will be introduced to how the ancient Romans wrote their numerals. You may like to research this on the internet with your child to compare the Roman numerals with the numerals we use today. The Ancient Romans used letters instead of numerals to show numbers.

I	1	XI	11
II	2	XII	12
III	3	XIII	13
IV	4	XIV	14
V	5	XV	15
VI	6	XVI	16
VII	7	XVII	17
VIII	8	XVIII	18
IX	9	XIX	19
X	10	XX	20
XXX	30	CL	150
XL	40	CLIX	159
XLIX	49	CXC	190
L	50	CC	200
LX	60	CCC	300
LXX	70	CD	400
LXXX	80	D	500
XC	90	DC	600
XCIX	99	CM	900
C	100	M	1,000

The Romans never used the same letter more than three times in a row.

Rule 1: If a letter is placed **a**fter a larger letter, you must **a**dd.

XI → 10 + 1 = 11

CLXII → 100 + 50 + 10 + 1 + 1 = 162

Rule 2: If a letter is placed **b**efore a larger letter, you must su**b**tract.

IX → 10 – 1 = 9 CM → 1,000 – 100 = 900

MCDIV → 1,000 + (500 – 100) + (5 – 1) = 1,404

Invite your child to have fun converting Roman numerals to our numerical system and vice versa. You can check his/her answers using an online Roman numeral converter (under supervision).

CJFallon

Mental strategies (estimation)

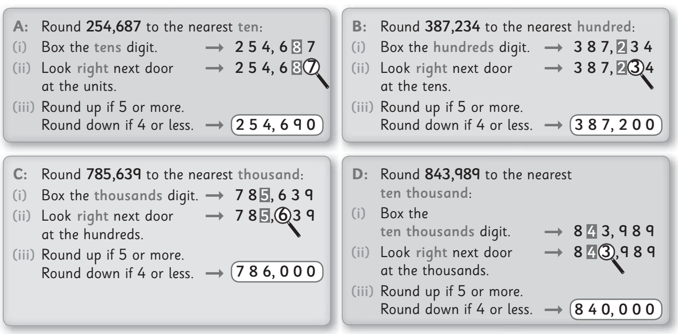
Your child will be learning about *estimation strategies*. S/he will be concentrating on addition and subtraction by *splitting* the second numbers, the *front-end* strategy and the *rounding* strategy. S/he will learn to round numbers to the nearest 10, 100, 1,000 and 10,000. S/he will solve problems and will be required to always estimate the answer to the problems before using the most appropriate strategy. Your child needs to know the mathematical language associated with estimation: round up/down, nearest ten thousand/thousand/hundred/ten, more than, less than, between, estimate, mental strategy, add, addition, subtraction, difference, take away, minus, total number, front-end strategy, calculate, highest, lowest, kilometres, litres, millilitres.

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

Rounding rhyme

1 through 4, stay on the floor.
5 through 9, climb the vine.

Rounding



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Introduce your child to the method of rounding as outlined on page 12 of your child's textbook. Discuss each rounding strategy with him/her.

Ask your child to round the following numbers to the nearest 10.

24,568 → 24,570; 32,492 → 32,490;
328,325 → 328,330; 652,652 → 652,650;
436,749 → 436,750; 523,167 → 523,170;
639,524 → 639,520; 939,799 → 939,800;

Ask your child to round the following numbers to the nearest 100.

28,536 → 28,500; 62,857 → 62,900;
426,728 → 426,700; 753,482 → 753,500;
338,649 → 338, 600; 123,651 → 123,700;
837,604 → 837,600; 909,069 → 909,100;

Ask your child to round the following numbers to the nearest 1,000.

74,368 → 74,000; 53,592 → 54,000;
358,225 → 358,000; 742,482 → 742,000;
846,449 → 846,000; 525,503 → 526,000;
643,874 → 644,000; 800,799 → 801,000;

More than or less than

Display various addition and subtraction problems within 99,999. Invite your child to estimate by rounding if the answers to the problems are more than a given number or less than it.

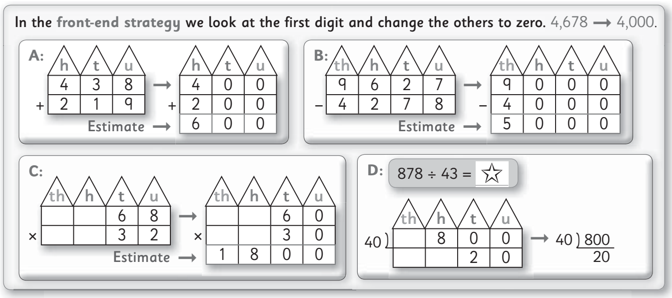
For example:
22,345 + 43,671 = ?
Is it more than or less than 50,000?

34,653 – 23,568 = ?
Is it more than or less than 10,000?

Discuss the strategy your child used.

Front-end strategy

Explain to your child that in *front-end estimation*, we concentrate on the **first** digit from the left (the digit with the greatest value) and change all the other digits to zero. For example, 9,627 can be used as 9,000; €8·54 can be used as €8 and $4\frac{1}{2}$km can be used as 4km.



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Invite your child to solve various problems using the front-end strategy, including problems with money and measures, as on page 13 of the textbook.
Ask your child to use the front-end strategy to estimate the answers to the following questions:

(a) 76 + 39 → 70 + 30 = 100.

(b) 358 + 598 → 300 + 500 = 800.

(c) 1,456 + 2,784 → 1,000 + 2,000 = 3,000.

(d) 7,573 – 2,647 → 7,000 – 2,000 = 5,000.

Ask your child to solve other questions similar to these.

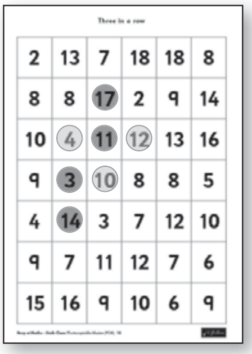
Addition and subtraction

Your child will be learning about *adding* and *subtracting* six-digit numbers over the coming days. S/he needs to know the mathematical language associated with addition and subtraction: and, add, altogether, plus, together, total, numbers 0–999,999, row, column, vertically, horizontally, diagonally, counting on, hundred thousands, ten thousands, thousands, hundreds, tens, units, hundreds house, tens house, units house, change, stay the same, addition house, base ten material, money, cheques, digit value, more, less, swap, regroup, digit, total, total amount, strategy, fewer, subtract, how many more, withdrew, combined, subtraction, opposite, biggest, smallest, smaller, compare, takes, number sentences, subtracts, subtraction, take away, estimate, value of the digits, subtraction house, equal, increase, change, difference, highest, lowest, total amount, least, greatest, sum.

Game 1: 3 in a Row

You will need to make a board as shown below.

Invite your child to roll three six-sided dice and to add the numbers shown. For example, if s/he throws a 4, 6 and 2, s/he adds these to get 12. Your child puts one of his/her red counters on one of the number 12s on the 3 in a Row game board. You take your turn rolling the dice, adding and placing one of your green counters on the corresponding number on the 3 in a Row game board. Play continues until one player connects three of his/her counters in a row vertically, horizontally or diagonally.



2	13	7	18	18	8
8	8	17	2	9	14
10	4	11	12	13	16
9	3	10	8	8	5
4	14	3	7	12	10
9	7	11	12	7	6
15	16	9	10	6	9

Note: These games provide practice at adding and subtracting in a play setting.

Game 2: Show the biggest number

Addition: For this game you will need a deck of cards, but remove all the picture cards (ace = 1). Each player gets nine cards. Everyone keeps their cards in a pile face down on the table. Your child turns over the top three cards and adds the totals together. For example, if s/he turns over a 7, 2 and 9, s/he adds them together to get 18. Now you take your turn. Compare the totals. The player who has the bigger total of the two wins a counter. Play continues like this until all the cards have been turned over. Whoever has the most counters at the end of the game is the winner.
Variation: You can add four/five/six cards together.

Subtraction: Each player gets eight cards. Turn over two cards at a time and subtract the smaller number from the larger number. Continue as outlined above.

Find my cards

Addition: You will need three players and a deck of cards with the picture cards removed for this game. Lay out all the cards face up on the table in a grid of four rows by 10 rows. Invite your child to begin. Your child looks at the grid of cards and secretly chooses two cards that are **beside each other vertically or horizontally.** S/he adds the two cards together, e.g. 6 of clubs and 3 of diamonds = 9, and tells the other players that the answer s/he gets is 9. S/he does not tell the others which two cards s/he is looking at. The others have to race to find the two cards or any other two cards that add up to the same total. The first person 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 of cards spreads out, the players can push the cards into a smaller grid.

Extension 1: Players can add three cards instead of two.
Extension 2: You can subtract 2 cards and proceed as above.

Count up

Materials required: Three different coloured dice (ideally 9-sided), pencil, paper

Addition: Invite your child to throw three dice and to add the totals shown on them. For example, if your child throws a 4, 6 and 5, the total is 15. Write 15 under your child's name on a piece of paper. Now you take your turn. Say you throw a 5, 3 and 4 to get 12. Write 12 under your name on the sheet of paper, as shown.

Child's name	Your name
15 + 10 25	12

Your child throws again. This time, for example, s/he throws a 5, 2 and 3 to get 10. S/he adds 10 to the 15 score s/he already has, to get 25. Play continues like this until one player gets to a target number, e.g. 100 (or any number you choose), and is declared the winner.

Subtraction: Begin at 99 and proceed as above except subtract to reach a target number.

CJFallon

Your child will be learning about *averages* over the coming days. Averages were introduced formally for the first time in 5th Class, so it is not a new mathematical concept for your child. However, s/he needs to know some of the language associated with averages: averages, average score, smallest, largest, middle, bar-line graph, bar chart, missing numbers.

Definition of the word average

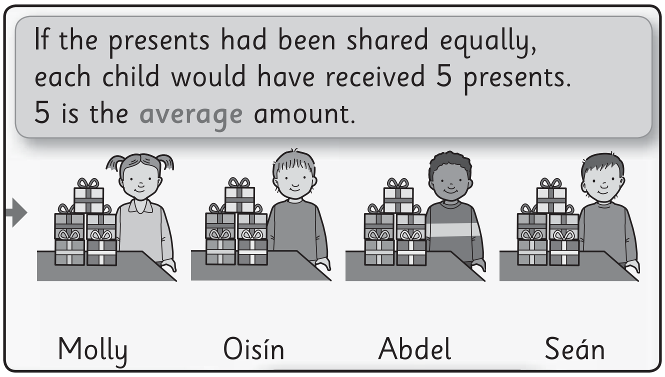
As a revision exercise, discuss the following phrases with your child to try to extract the meaning of the word average:

- *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 6 points in each hurling match he played during the league.*
- *The contestant got an average score of 7 from the judges during the contest.*
- *The average summer temperature in Carlow during July last year was 16 degrees Celsius (16°C).*

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

Calculating averages

The quick way to calculate the average of a set of numbers is to find the total value of the numbers and then divide it by the amount of numbers in the set.



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Talk your child through the following problem:

- *The total number of presents that the children have is 4 + 7 + 6 + 3 = 20.*
- *There are four children, so we divide 20 by 4.*
- *The average number of presents is 20 ÷ 4 = 5.*

Activity 1: Help your child calculate the average age, height and weight of the members of your family. If the averages don't work out evenly, round the results to the nearest whole number, e.g. 142·83cm rounds to 143cm; 48·2kg rounds to 48kg.

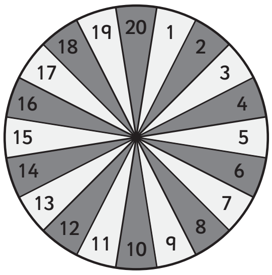
Activity 2: Help your child calculate the average weight of a selection of fruits, crockery, tins, general items, etc. from around the home.

Scrabble/darts

Playing a game like Scrabble with the family can be great fun. After each word is placed on the Scrabble board, encourage your child to calculate the average value of each letter in the word,
e.g. 4 + 0 + 6 + 8 + 7 + 5 = 30.
The average = 30 ÷ 6 = 5.

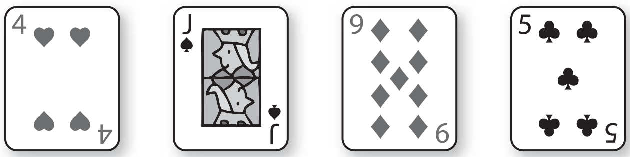
Note: The 0 counts as a number in the set.

If the average doesn't work out evenly, just round the answer to the nearest whole number.



If you have a dartboard, use it with your child (once your child can throw the dart safely!). You can make your own as shown. The game is great for encouraging your child with mental maths – adding up the score of the three darts and calculating doubles/trebles. A simple game would be to have each player take eight turns (of throwing three darts). The total of the eight turns should be calculated and the average scores should be worked out. The player with the highest average wins.

Four-card draw



Family members could play this simple game. One player is the dealer. The dealer must shuffle the cards and place four cards in front of each player, including him/herself. Each player must calculate the average value of the four cards. The player with the highest average wins.

Notes:

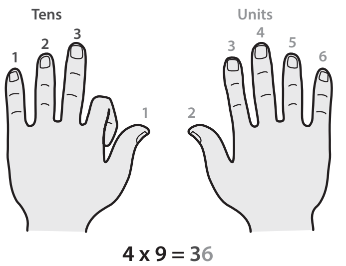
- Picture cards are worth 10 points.
- Aces are worth 1 point.
- If the average doesn't work out evenly, just round the answer to the nearest whole number to ensure that the average works out evenly.

CJFallon

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), maths facts, 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 (opposite), smaller than, less than, list, grid, repeated addition/equal grouping, half, rectangular arrays, rows, columns, equation, represent, digits, power of 10, extended tables, vertical, horizontal, product, factor, multiples, common multiple, strategy, estimate, rounding, average, times, groups, kilogrammes, total, total cost, decimal number, centimetres, metres, kilometres, hours, days, average, square kilometres, pounds (sterling), per litre of fuel.

Strategy: Nine facts and fingers



Invite your child to place both of their hands face down on their table. Ask him/her to mentally number their fingers from left to right beginning with 1 on the small finger on the left hand. Now invite him/her to bend under their fourth finger (This is to represent the 4 in the question). Tell him/her that the fingers to the left of the bent finger are tens (they can count the 3 tens) and the fingers to the right of the bent-under finger are units (they can count the 6 units). The total number of straight fingers represent the 9 in the question. Therefore, the answer to 4 x 9 = 36. Invite him/her to show other number facts involving 9s using their fingers and allow them to work out the answer for him/herself.

Multiplying game 1: Show the biggest number

This game can be played by two to four players using a deck of cards with the picture cards removed and the ace = 1. Each player gets 10 cards. They keep their cards in a pile face down on the table. Player A turns over his/her top two cards and multiplies the numbers together. For example, if Player A turns over a 7 and 9, s/he multiplies them to get 63. Player B does the same.

If Player B turns over a 6 and 8, s/he multiplies them to get 48. Player A and Player B compare the totals, and whichever player has the bigger total wins a cube. In this case, Player A wins a cube as 63 is bigger than 48.

Play continues like this until all the cards have been turned over. Whoever has the most cubes at the end of the game is declared the winner. Your child can write the number sentences for each turn in his/her maths copy, e.g. $7 \times 9 = 63$.

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

Multiplying game 2: Find my cards

This game can be played by two to four players using a deck of cards with the picture cards removed and the ace = 1. Lay out all the cards face up on the table in a 4×10 grid. Player A begins by looking at the grid of cards. S/he secretly chooses two cards that are beside each other vertically, diagonally or horizontally. Player A multiplies the two cards together, e.g. 6 of clubs and 3 of diamonds to get 18. S/he tells the other players that the answer s/he gets is 18. S/he does not tell them which two cards s/he is looking at. The others have to race to find the two cards or any other two cards that multiply to give the same product (e.g. 9×2), but the cards must be beside each other vertically, diagonally 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.

Multiplying a decimal number by a 2-digit number

Steps to follow:

1. Estimate the answer by rounding the decimal numbers to the nearest whole number.
2. Calculate the actual answer ignoring the decimal points for now.
3. Discuss where the decimal point should go based on the estimate.
4. Compare the answer to the estimate.

Pose this problem: The record length of a python is 7·671metres. What would be the total length of 26 such pythons?

1. Invite your child to estimate by rounding 7·671m to the nearest whole number and then to multiply it by 26. Elicit from your child that $8\text{m} \times 26 = 208\text{m}$.
2. Invite him/her to work out the actual answer to $7{\cdot}671\text{m} \times 26$ using the long multiplication method, (ignoring the decimal point for now). The answer s/he should get will be 199446.
3. Discuss where the decimal point should go and allow your child to justify the answer: 199·446 m is correct as the estimate was 208m.
4. Compare the answer to the estimate.

CJFallon

Division 1

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)

Note: All the activities outlined in the home/school link pages in Chapter 6 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

It is important that your child is 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 $\overline{)45}$

Activity 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 3 times table, and invite your child to count down in 3s from that number. This can be done for any of the division tables.

Activity 2: Division is the opposite of multiplication

Your child needs a lot of practice using materials, both orally and written, to establish the fact that division is the inverse of multiplication.

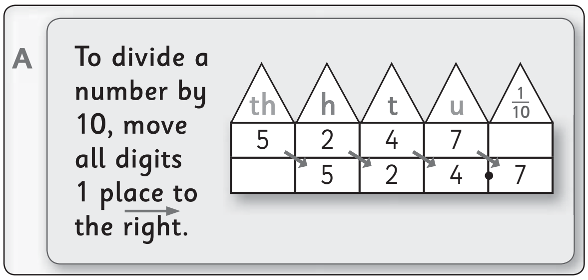
4 × 3 = 12	3 × 4 = 12	12 ÷ 3 = 4	12 ÷ 4 = 3

How many 4s are in 12?	12 ÷ 4 = ____
How many 3s are in 12?	12 ÷ 3 = ____
4 times what number is 12?	4 × ____ = 12
3 times what number is 12?	3 × ____ = 12

Invite your child to place 12 counters on paper plates (you will need four plates). Ask: *How many groups of 3 can you make with the 12 counters? Yes,* 4. Invite your child to make three groups of 4. Ask: *How many groups of 4 can you make with the 12 counters? Yes,* 3.

Divide a number by 10

When dividing a number by 10, lead your child to discover that the digit moves one place to the right. It is essential that s/he is led to discover this movement through the use of concrete materials.



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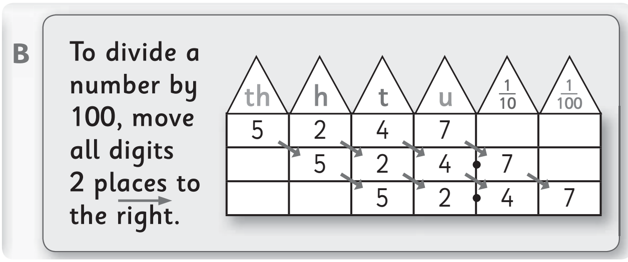
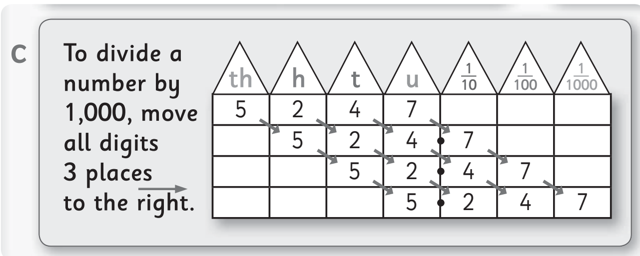
Note: Your child will need a thorough knowledge of place value to understand this concept.
Make a notation board as shown above or ask the teacher for a copy of one. Invite your child to display the number 48, for example. Invite your child to move the number one place to the right and ask: *What number do you have now? Yes,* 4·8. Activities such as this will help your child understand that it is the digits that move and not the decimal point when dividing by 10.
Now invite your child to place other numbers on the notation board and allow him/her to discover what happens when dividing by 10, e.g. 5, 364, 8,293. Invite your child to move each number one place to the right.
Ask: *What number do you have now?* (0·5, 36·4, 829·3)

Divide by 100 and 1,000

Work similarly for dividing by 100 and 1,000.





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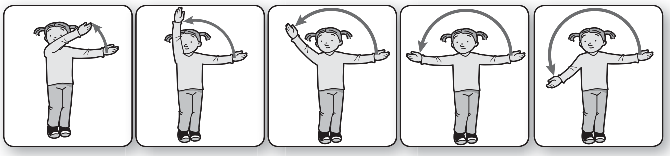
When dividing a number by 100, lead your child to discover that the digit moves two places to the right. When dividing a number by 1,000, lead your child to discover that the digit moves three places to the right. Ask your child to divide different numbers by 100 and 1,000.

Your child will be learning about *lines and angles* over the coming days. S/he needs to know some of the language associated with lines and angles: angle, acute, right, straight, obtuse, reflex, rotation, protractor, inside scale, outside scale, measure, estimate, triangle, side, trapezium, quadrilateral, clockwise/anti-clockwise movement.

Angles

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



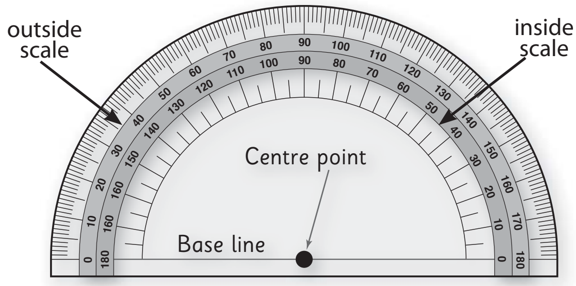
acute angle | right angle | obtuse angle | straight angle | reflex angle

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

Ask your child to use his/her body parts – such as 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 the different types of angles mentioned above. You could also do some fun yoga poses with your child, creating and identifying the different angles made by different joints.

Using the protractor

Your child learned how to use a protractor in 5th Class, to both measure and draw angles.

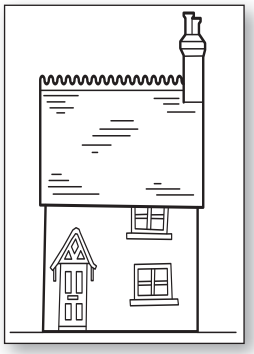


Note: 45 degrees = 45°.

Ask your child to revise the use of the protractor by asking the following questions:

- *How many degrees are shown on a protractor? Yes, 180°.*
- *Show me the inside scale/outside scale.*
- *Draw an angle that measures 45°.*
- *Draw a right angle (90°).*
- *Draw a straight angle.*
- *Draw an angle of 80°.*
- *Draw an angle of 145°.*

Angle hunt



Walk around the inside or outside of your home. Encourage your child to find examples of angles that are acute, right, obtuse, straight and reflex. Help your child measure these angles with a protractor. Examples are corners of doors/windows, door hinges, slightly opened doors or windows, spokes in a wheel, a book that is partially opened, etc.

Clock angles

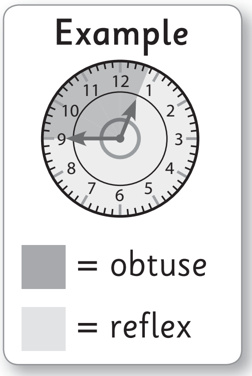
There are 360 degrees in a circle. When the big hand of the clock has rotated from 12 and back to 12 again, it has turned a full rotation, or 360 degrees (360°).

There are 60 minutes in an hour, so to calculate how many degrees the minute hand (long hand) turns in one minute, we simply divide 360° by 60: 360° ÷ 60 = 6°. So, the clock hand has turned 6 degrees (6°) in one minute. Ask your child to calculate how many degrees the long hand will turn in 5/20/30/45/60/90 minutes and so on.

Extension 1: Ask your child to calculate how many degrees the long hand will turn in:

$\frac{1}{4}$ hour, $\frac{1}{2}$ hour, $\frac{1}{12}$ hour, $\frac{5}{12}$ hour, $\frac{1}{3}$ hour,

$\frac{2}{3}$ hour, $\frac{7}{12}$ hour, $\frac{11}{12}$ hour, etc.



Extension 2: Ask your child to use the two hands of the clock and a protractor to make specific angles, e.g. 160 degrees. The clock hands will always make two angles: one angle will always be a reflex angle, except where it makes two straight angles on the half hour. Encourage your child to calculate the measure of both angles made by the hands of the clock.

Note: There are 360 degrees in a circle (the face of a clock)! Every 5 minutes make up $\frac{1}{12}$ of an hour or $\frac{1}{12}$ of a full turn. Therefore every 5 minutes represents 30° as 360° ÷ 12 = 30°.

Fractions 1

Your child will be learning about *fractions* over the coming days. S/he needs to know some of the mathematical language associated with fractions: fractions, mixed numbers, equivalent/equivalence, compare, numerator, denominator, number line, above the line, below the line, common denominators, addition, subtraction, multiplication of segments.

Fraction names

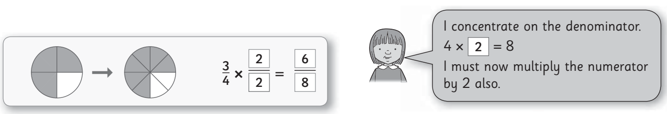
$\frac{3}{4}$ = a fraction

$\frac{15}{4}$ = an improper fraction or top heavy fraction

$3\frac{3}{4}$ = a mixed number (whole number + fraction)

Equivalent fractions

Many fractions have more than one name. For example, $\frac{1}{2}$ is equivalent to (the same as) $\frac{2}{4}, \frac{3}{6}, \frac{4}{8}, \frac{5}{10}, \frac{6}{12}, \frac{8}{16}$ and so on. In school, your child will be learning that if we multiply any number by 1, it keeps the same value. Similarly, if we multiply any fraction by 1 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. Similarly, dividing by 1 whole will also give us equivalent fractions.



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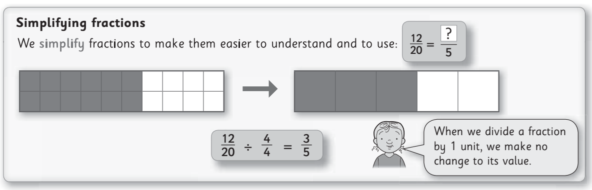
Simplify fractions

Dividing a fraction by 1 whole, or by $\frac{2}{2}, \frac{3}{3}, \frac{4}{4}$, etc., will also give us equivalent fractions.



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Add and subtract fractions with different denominators

We cannot add or subtract fractions with different denominators immediately. If the fractions have different denominators, the fractions must be changed to an equivalent fraction (same value but a different denominator). This is done by finding the lowest common denominator (LCM).

Try this sum: $\frac{5}{6} + \frac{7}{9} = ?$

We must write out a list of equivalent fractions for each and find the first denominator that is shared by the two fractions.

$$\frac{5}{6} = \frac{10}{12} = \frac{15}{18}\text{, etc.}$$

$$\frac{7}{9} = \frac{14}{18} = \frac{21}{27}\text{, etc.}$$

We can see that 18 is the common denominator. Now we can add the two fractions:

$$\frac{5}{6} \rightarrow \frac{15}{18}$$
$$\frac{7}{9} \rightarrow + \frac{14}{18}$$
$$= \frac{29}{18}$$

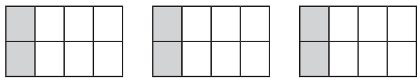
$\frac{29}{18}$ is known as an *improper fraction* (the top is bigger than the bottom). We can change this into a *mixed number*:

$$\frac{29}{18} = 1\frac{11}{18}$$

Note: Subtracting fractions with different denominators is done in the same way (vertically).

Multiply fractions by a whole number

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



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

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 fraction →

$$\frac{2}{8} \times \frac{3}{1} = \frac{6}{8} \rightarrow \frac{3}{4}$$

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

Multiply a fraction by a fraction

To multiply two fractions, we simply continue using the rule *multiply the top by the top and the bottom by the bottom.*

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

$$\frac{2}{3} \times \frac{3}{4} = \frac{6}{12} \rightarrow \frac{1}{2}$$

Where possible, we always simplify the answer.

Note: Whenever we see the word **of** in mathematics, it means we must multiply. For example:

- *What is $\frac{3}{5}$ of 40*
- $\frac{3}{{}_{1}\not{5}} \times \frac{\not{40}^{8}}{1} = \frac{24}{1} = 24$

Give your child some other questions to solve.

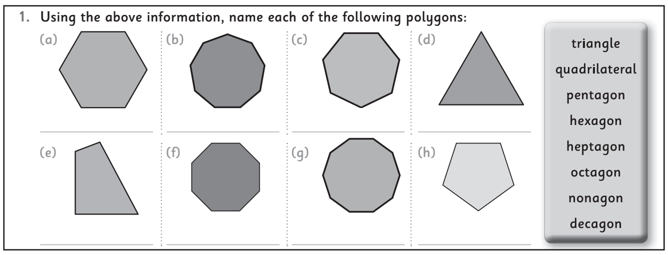
CJFallon

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 of work done in earlier classes, but new shapes – the heptagon (7-sided), nonagon (9-sided), decagon (10-sided), and the kite – will be introduced for the first time. Your child will also be learning how to plot co-ordinates on a grid for the first time. S/he needs to know the mathematical language associated with 2-D shapes: polygon (any shape with three or more straight sides), quadrilateral (any shape with four straight sides), square, rectangle, rhombus (square out of shape), parallelogram, trapezium, kite, pentagon, hexagon, heptagon, octagon, nonagon, decagon, tangram (Chinese puzzle with 7 shapes), regular, irregular, angles, acute, right, obtuse, tessellate (shapes that form patterns without leaving gaps are said to tessellate), rotational, reflected, intersect, hexomino (6 squares), pentomino (5 squares), symmetrical.

Polygons

Polygons are shapes that have three or more straight sides only. Regular polygons have all equal sides and equal angles. Help your child figure out which of the following polygons are regular/irregular.



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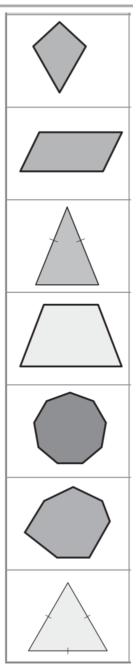
Quadrilaterals

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

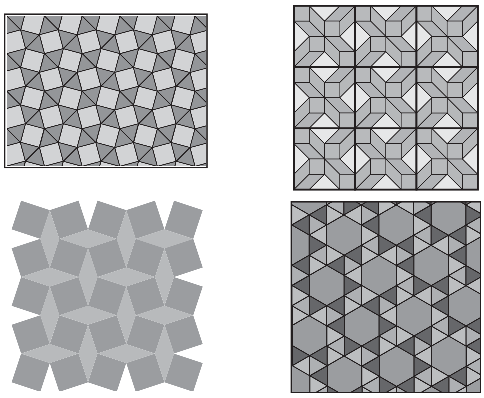
- *How many sides/angles does each shape have?*
- *Which of the shapes are regular/irregular?*
- *Which shapes have right/acute/obtuse angles?*



Ask your child to identify real objects around the house that have the above outlines, e.g. doors, windows, tents, classroom tables, flags. Ask your child to make the above shapes using straws, sticks, crayons, headless matches, etc.

Tessellating shapes

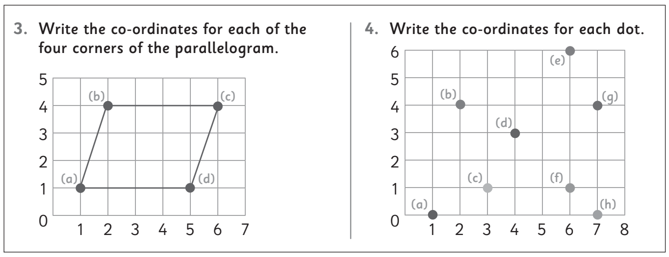
Tessellating shapes fit together without overlapping or leaving gaps. Sometimes two or more different shapes can be combined to fit together without leaving gaps.



With your child, search for real examples of tessellation around the home or local environment, such as floor/bathroom tiles, patterns on wallpaper, curtains, etc . Ask your child to research the artist M.C. Escher and his interesting work on tessellation using the internet under supervision.

Co-ordinates

Co-ordinates are used in mapping. They give the exact location of an object. We read co-ordinates by reading across the grid (from the bottom) and then reading up the side of the grid.



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Look up 'simple maps with co-ordinates' online. You will find items such as treasure maps! Help your child find specific co-ordinates of objects on the maps or plot the co-ordinates of specific items on the maps.

To find the co-ordinates of the dot at (a), (question 3) we go across the bottom row of numbers to 1. We than go up the side column of numbers to 1. The co-ordinates for (a) are (1, 1). To find the co-ordinates for (c), we go across the bottom row of numbers to 6. We then go up the side column of numbers to 4. The co-ordinates of (c) are (6, 4). Now ask your child to find the co-ordinates for the letters b and d. Complete question 4 also.

Ask your child to make a grid of his/her own and to work out the co-ordinates for each letter (dot) that s/he places on the grid.

CJFallon

Fractions 2

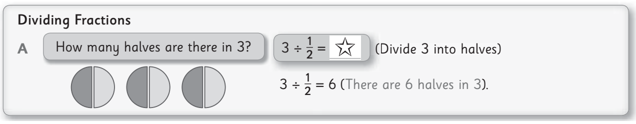
Your child will be learning more about *fractions* over the coming days. Ratios will be introduced for the first time as a part of the fractions topic. However, your child has dealt with ratio in 5th Class in terms of chance, e.g. there is a 1: 6 chance of rolling a die (dice) and getting a 4. Your child needs to know some of the mathematical language associated with fractions: division, dividing, sharing, pattern, reciprocal, compare, ratios, unitary method, simplify (make smaller and show the fraction in its lowest terms, e.g. $\frac{12}{15} = \frac{4}{5}$).

Divide a whole number by a fraction

Pose the question: Divide 3 by $\frac{1}{2}$.

$$3 \div \frac{1}{2} = ?$$

This simply means that we must divide 3 units into halves.



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There are 6 halves in 3 so, $3 \div \frac{1}{2} = 6$.

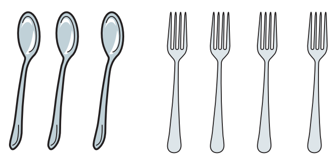
Encourage your child to see the link between multiplication and division. Multiplication is the inverse (opposite) of division. If we turn the $\frac{1}{2}$ around, we get $\frac{2}{1}$. ($\frac{2}{1}$ is called the reciprocal of $\frac{1}{2}$.) Because we are using the *reciprocal*, or opposite, of $\frac{1}{2}$, we must perform the opposite function to division, which is multiplication:

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

Multiplying by the reciprocal is a quicker and easier way of dividing by a fraction, but your child must understand the logic behind this before using the reciprocal method.

Ratios and fractions

Ratios are simply a way of comparing two quantities. Look at the following picture:



There is a total of seven pieces of cutlery in the picture. We can determine the following from this information:

- *The ratio of spoons to forks is 3 : 4.*
- $\frac{3}{7}$ *of the cutlery is spoons.*
- $\frac{4}{7}$ *of the cutlery is forks.*

Activity 1: Work out simple ratios and fractions relating to the members of your family. For example:

- *What is the ratio of males to females?*
- *What is the ratio of family members who prefer reading to cycling?*
- *What is the ratio of family members who prefer the colour red to the colour green?*

Help your child translate these ratios into fractions, e.g. What fraction of your family is male/female?
3 males: 4 females → 3:4.

Activity 2: You can use a variety of different household items/fruits/tins/cutlery, etc. to find ratios. For example, what is the ratio of:

- *Apples to bananas?*
- *Pasta shells to cups?*
- *Bowls to plates?*
- *Jumpers to trousers?*
- *Teaspoons to soup spoons?*
- *Sausages to chips?*
- *Cups to saucers?*
- *Shoes to socks?*

The unitary method

A. Pose the question: If $\frac{3}{10}$ of my money is €21, how much money do I have in total?

The unitary method simply means that if we know *three* parts of the whole amount, we can use that information to find *one* part. And if we know one part, we can easily find the *total*.

- *We are told that* $\frac{3}{10}$ *= €21.*
- *That means that we know three parts.*
- *To find one part, we simply divide by 3!*
- *€21 ÷ 3 = €7 (so* $\frac{1}{10}$ *is €7).*
- *Now that we know one part, to find the whole amount, or* $\frac{10}{10}$*, we simply multiply by 10!*
- *€7 × 10 = €70, so the whole amount is €70!*

Quick way:

$\frac{3}{10}$	=	3)21
$\frac{1}{10}$	=	7
$\frac{10}{10}$	=	× 10
		70

B. Pose the question: If $\frac{5}{8}$ of my money is €24·50, how much money do I have altogether?

$\frac{5}{8}$ is equal to €24·50
$\frac{1}{8}$ must be 5)€24·50
€4·90

$\frac{8}{8}$ is all of my money → €4·90 × 8 = €39·20

Quick way:

$\frac{5}{8}$	=	5) €24·50
$\frac{1}{8}$	=	€4·90
$\frac{8}{8}$	=	× 8
		€39·20

CJFallon

Learning through the calculator

Your child will be learning various mathematical concepts through the use of the *calculator* over the coming days. These activities will mainly involve the addition, subtraction, multiplication and division operations. S/he needs to know the mathematical language associated with the calculator: calculator, key, estimate, digit, column, subtract, directly above, keyboard, below, pattern, times tables, answer, calculate, operations, number sentence, true, percentages, reduction, round, decimal places, price, multiply, marked price, target number, fewest, consecutive numbers, average, middle number, amounts, even, odd, adding, centimetre, kilometre, clear key, clear entry, calculation, screen display, broken key.

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 of if s/he makes a mistake.

Note: It is essential to ask 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 invite your child to keep pressing the = key to count up in 9s with your calculator. All the multiples of 9 should appear. This is a good way to explain/learn all the multiplication tables as repeated addition.

Repeated subtraction

Invite your child to key in the number 7 2 on the calculator, followed by the – key, followed by the 8 key. Now invite your child to keep pressing the = key to count back in 8s on your calculator. This is a good way to explain/learn all the division tables.
It shows division as repeated subtraction.

Activity 1: Missing operations

Invite your child to investigate which operation/symbol (+, −, ×, ÷) should be used to complete the following.

(a) 24 ◯ 3 = 8
(b) 60 ◯ 12 = 48
(c) 15 ◯ 6 = 90
(d) 102 ◯ 13 = 115

Activity 2: Missing digits

Invite your child to calculate the missing number to complete the number sentence. Have him/her apply this strategy to larger numbers.

(a) (4 + □) + 3 = 12
(b) (20 – □) – 7 = 9
(c) (2 × □) × 4 = 24
(d) (□ ÷ 2) – 5 = 4

Activity 3: Target numbers

Invite your child to help you reach various target numbers starting from a given number using the fewest possible attempts. For example, start at 575. The target number is 159.

1. Take away 400: 575 – 400 = 175.
2. Take away 15: 175 – 15 = 160.
3. Take away 1: 160 – 1 = 159.

We reached the target number in just three separate operations. See if your child can reach the target number using a different strategy.

Do this with a number of other examples.

CJFallon

Decimals

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, metre, decimal number, decimal fraction, bigger, smaller, unit, ten, hundred, thousand, equal part, odd one out, decimal point, value of digits, place holder, rectangles, metre, centimetre, swap, after, before, between, less, more than, group, sets, bundles, count, match, count forwards, count backwards, thousands house, hundreds house, tens house, units house, tenths house, hundredths house, thousandths house, divide, kilogramme, gramme, litre, millilitre, kilometres, second, sum, calculate, average, total, results, difference, ascending order, ratio, value, equivalent.

Definitions

A decimal number is a number that has a decimal part. 9 is a whole number, but 9·345 is a decimal number.

A decimal fraction is the decimal part of a decimal number. 9·345 is a decimal number, but 345 or $\frac{345}{1000}$ is the decimal fraction, as it is less than 1 unit.

The decimal point

Discuss the function of the *decimal point* with your child. To separate the units from the fractions, we use a decimal point. 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.

Explain that 0·437 in words is: *zero point four three seven* **or** *four hundred and thirty-seven thousandths* **or** *4 tenths + 3 hundredths + 7 thousandths.*

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

Dice lotto

You will need four different coloured dice (nine-sided dice are ideal, but if they are not available, six-sided dice will suffice), digit cards and a red counter representing the decimal point, and cubes

Player A rolls the dice and makes the biggest decimal number (to three decimal places) possible. For example, if Player A rolls a 3 on the first die, 6 on the second die, 7 on the third die and 3 on the fourth die, 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. For example, if s/he rolls a 4, 3, 6 and 5, the biggest number s/he can make is 6·543. Player B can write the number on a piece of paper. Whichever player's number is the bigger 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 one player wins five cubes.

Playing cards lotto

Each player gets 12 cards. They are not allowed to look at them. Each player takes the top four cards from the pile and turns them face up on the table. They arrange the four cards to make the biggest decimal number possible to three decimal places (only one number can be used as units). They call out the numbers they have made. For example, if Player A turns over a 8, 3, 2 and 9, the biggest number s/he can make is 9·832. Whichever player has the biggest decimal number wins a cube. Play continues until one player wins five cubes.

Converting fractions to decimals

Give your child 10 cubes. Invite him/her to show half of the cubes and ask: *How many cubes do you have? Yes, 5.* Now invite your child to show 0·5 of the cubes. Ask: *How many cubes do you have now? Yes, 5.*

So, $\frac{1}{2} = 0{\cdot}5$.

Through questioning, lead your child to discover that decimals and fractions are simply different ways of showing the same value.

Converting fractions to decimals

Invite your child to discover the rule for changing fractions to decimals by closely examining the following table. Divide the top number (numerator) by the bottom number (denominator) in each case. S/he may use a calculator if s/he wishes.

$$\frac{3}{8} \rightarrow \begin{array}{r} 0{\cdot}375 \\ 8\overline{)3{\cdot}000} \end{array} = 0{\cdot}375$$

Extension: Invite your child to convert fractions to decimals where the fractions won't divide evenly, e.g. 1/3, 2/3, 5/12. Tell your child to stop after two or three decimal places and round.

$$\frac{1}{3} = \begin{array}{r} 0{\cdot}333333 \\ 3\overline{)1{\cdot}000000} \end{array}$$

Answer: $\frac{1}{3} = 0{\cdot}33$

Number theory

Your child will be learning about *number theory* over the coming days. S/he needs to know the mathematical language associated with it: factors, divisors, product, related pairs of factors, highest common factor, whole number, divide, even, odd, multiples, lowest common multiple, prime numbers, composite numbers, divisible, remainder, exactly, divide, sum of, digits, divisors, divisibility tests, triangular number, triangle, pattern, diagram, square number, square, multiplied, calculate, area, dimensions, length, width, number sentence, exponent, indices, powers, square root.

Factors/divisors

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

4	×	7	=	28
Factor	×	factor	=	product

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, e.g., call out the product 24. Your child could offer 8 and 3 as factors. S/he gets 1 point. S/he could offer other factors for the product 24 to gain 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 the missing factors. The player with the most points at the end of the game is the winner.

Find the highest common factor

Pose the problem: Find the highest common factor (HCF) of 12 and 18.

Give your child 12 cubes. Invite him/her to make rectangles of various sizes using all 12 cubes. S/he will make rectangles with the following dimensions: 1×12, 2×6, 3×4. Now invite him/her to list the factors of 12:

→ 1, 2, 3, 4, 6, 12.

Now invite your child to make rectangles of various sizes using 18 squares. S/he should make rectangles with the following dimensions: 1×18, 2×9, 3×6. Now invite him/her to list the factors of 18:

→ 1, 2, 3, 6, 9, 12.

Discuss the common factors and give the highest common factor (HCF). The common factors are 1, 2, 3 and 6, with 6 being the HCF.

Multiples

Invite your child to group cubes into sets of eight. Invite him/her to count the total number of cubes by skip counting in 8s. Explain to him/her that these numbers (8, 16, 24, 32...) are multiples of 8. This activity can also be done with all multiplication tables 1 to 10.

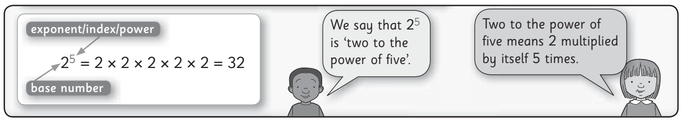
Prime and composite numbers

Give your child 12 cubes/counters/coins. Invite him/her to make rectangles of various sizes using all 12 cubes, e.g. 1 x 12, 2 x 6, 3 x 4. Proceed as above for different numbers, such as 2, 3, 4, 5, 6, 7, 8, 9. Explain that the numbers that have only one row, e.g. 2, 3, 5, 7, are called *prime* numbers. All the other numbers are *composite*.

Exponents, powers and indices

Invite your child to set out two cubes.
Now ask him/her to multiply those two cubes by 2.

- *How many cubes do you have now? Yes,* $2 \times 2 = 4$.
- *Now multiply the four cubes by 2.*
  How many cubes do you have now? $2 \times 2 \times 2 = 8$.
- *Now multiply the eight cubes by 2.*
  How many cubes do you have now? $2 \times 2 \times 2 \times 2 = 16$.
- *Now multiply the 16 cubes by 2. How many cubes do you have now?* $2 \times 2 \times 2 \times 2 \times 2 = 32$.



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Make square numbers

Invite your child to make squares with the cubes, beginning with one cube, then four, nine and so on. Allow him/her to discover how many more cubes must be added to the square to make the next square number.

Ask questions such as:

- *How many cubes are in a 3 x 3 square?*
- *If we make a square using 16 cubes, how many cubes will be along each side?*

Square roots

Ask your child: *What number, when multiplied by itself, equals 100?*

$\_\_\_\_ \times \_\_\_\_ = 100$ → $10 \times 10 = 100$

Therefore, 10 is the square root of 100 or $\sqrt{100} = 10$.

Now ask your child to find $\sqrt{9}$, $\sqrt{16}$, $\sqrt{25}$, $\sqrt{36}$, etc.

CJFallon

Multiplication 2

Your child will be learning more about *multiplication* over the coming days. This was first introduced in Sheet 6 earlier in the year. S/he needs to know some of the mathematical language associated with multiplication: multiply, multiplication symbol (×), maths facts, 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, pattern, list, grid, repeated addition/equal grouping, half, rows, columns, equation, represent, digits, power of ten, extended tables, vertical, horizontal, product, factor, multiples, common multiple, strategy, estimate, rounding, average, times, groups, total, difference, result, litre, decimal number.

Note: Play the following games with your child to revise and consolidate the multiplication tables.

Multiplying game 1: Show the biggest number (using two cards)

This game can be played by two players. Remove all the picture cards from the deck. Give each player 20 cards. The players keep their cards in a pile face down on the table. Player A turns over the top two cards and multiplies the numbers together, e.g., if Player A turns over a 7 and a 9, s/he multiplies them to get 63. Player B does the same. Player A and Player B compare the totals, and whichever player has the bigger total wins a cube. Play continues like this until all the cards have been 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.

Multiplying game 2: Find my cards

A minimum of three players is required for this game. Remove all the picture cards from the deck, then lay out the 40 cards face up on the table in a 4 x 10 grid. Player A begins. S/he looks at the grid of cards and chooses two cards that are beside each other diagonally, vertically or horizontally. Player A multiplies the two cards together, e.g. the 6 of clubs and 3 of diamonds to get 18. S/he tells the other players that the answer s/he gets is 18. S/he 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. 9 × 2). However, the cards must be beside each other diagonally, 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.

Rounding decimal numbers

Use length/distance to help your child round decimal numbers (up to three places) to the nearest whole number. For example:
What whole numbers is 12·578km between? (12km and 13km). Which number is it closer to? (13km.)

Proceed as above with other lengths/distances initially. As your child becomes familiar with rounding decimals using the concept of length, invite him/her to round weights (15·342kg) and capacities (6·269l) and so on to the nearest whole numbers.

Steps to follow when multiplying decimals

1. Estimate the answer by rounding the decimal numbers to the nearest whole number.
2. Calculate the actual answer, ignoring the decimal points, for now.
3. Discuss where the decimal point should go based on the estimate.
4. Compare the answer to the estimate.

Multiply a decimal number by a decimal

Pose the question: Maria weighs 63·52kg. Marcus is 1·4 times heavier. How much does Marcus weigh?

1. Invite your child to estimate by rounding both weights to the nearest whole numbers:
   64kg × 1 = 64kg.
2. Invite him/her to work out the actual answer to 63·52kg × 1.4 using the long multiplication method (ignoring the decimal point for now). The answer is 88928kg.
3. Discuss where the decimal point should go and allow your child to justify his/her answer.
   88·928kg is correct, as the estimate was 64kg.
4. It is essential that your child first estimates the answer to any multiplication problem involving decimals by means of *rounding*. After carrying out the procedure, it is crucial that your child compares the answer to the original estimate.

CJFallon

Your child will be learning more about *division* over the coming days. Your child needs to know some of 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, decimal point, whole number, decimal places, estimate, sum, kilogramme, average, difference, metres, kilometres, litres, equally, decimal fraction, approximate length, product, thousandth, calculate, total.

Note: All the activities outlined in the Home/School Link Sheets 6 and 7 are also relevant to this chapter. You may wish to revise some of those activities with your child.

Counting activity: Countdown!

This game is played by counting down from a given number of each division table. Provide the start number, e.g. 45 for the 3 times table, and invite your child to count down in 3s from that number. This can be done with all the division tables.

Warm-up activity: CANBE

Call out a set of random numbers, one at a time. Invite your child to call out CANBE when s/he recognises a number that is divisible by either 3, 6 or 9. A winning answer earns a point. After calling out CANBE, your child must back up his/her claim by proving that the number in question can actually be divided evenly be the chosen number.

For example, tell your child that you are searching for numbers that can be divided evenly by 9. Call out numbers randomly, e.g. 34, 41, 54. Your child is required to 'interrupt' on 54 by saying CANBE. Your child is then required to prove his/her claim by stating that 54 can be divided evenly by 9 by giving the division sentence 54 ÷ 9 = 6. Award your child a point when s/he gives 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 CANBE solution, provided s/he completes a correct division sentence too. Now play the same game using the 2, 4 and 8 or the 5 and 10 number facts.

Dividing a decimal by a decimal (up to one place)

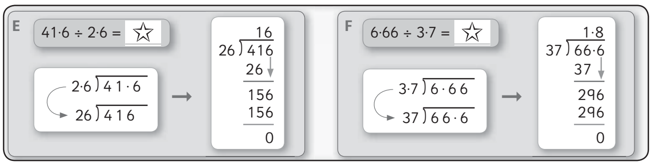
Invite your child to explain how to make the decimal numbers 5·8, 9·3 and 0·3 into whole numbers (answer: by multiplying by 10 and moving the digit one place to the right).

5·8	×10 →	58·0
9·3	×10 →	93·0
0·7	×10 →	7·0

Explain to your child that when dividing a decimal number by a decimal number, we must first make the divisor into a whole number. What you do to the divisor, you must also do to the dividend so that no real change has actually been made. Allow your child to discover, by using a calculator, that 41·6 ÷ 2·6 has the same answer as 416 ÷ 26. Invite your child to explain why this is the case.

Remember:

20	÷	5	=	4
dividend	÷	divisor	=	quotient



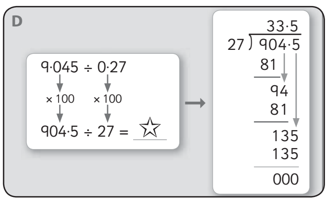
Dividing a decimal by a decimal (up to two and three places)

Invite your child to explain how to make the following decimal numbers into whole numbers:

- *Multiply by 100 (move the digit two places to the right).*
- *Multiply by 1,000 (move the digits three places to the right).*

×100			×1,000		
1·37	×100 →	137·0	1·37	×1,000 →	1,370·0
3·93	×100 →	393·0	3·93	×1,000 →	3,930·0
0·78	×100 →	78·0	0·78	×1,000 →	780·0
12·04	×100 →	1,204·0	12·04	×1,000 →	12,040·0

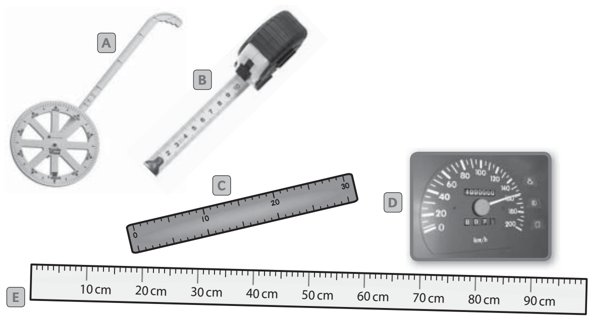
Explain to your child that when dividing a decimal number by a decimal number, we first make the divisor into a whole number. What you do to the divisor, you must also do to the dividend so as to make no real change. Allow him/her to discover by using a calculator that 84·48 ÷ 2·4 has the same answer as 844·8 ÷ 24. Invite your child to explain why this is the case.



Your child will be learning about *length* over the coming days. S/he will learn about units of measure, including the millimetre (mm), centimetre (cm), metre (m) and kilometre (km). S/he will learn how to express these lengths in both fraction and decimal form. S/he will learn how to add, subtract, multiply and divide units of length, calculate the perimeter of 2-D shapes, measure the length and width of a variety of objects and solve real-life problems involving length. S/he needs to know some of the mathematical language associated with the metric system: millimetres, centimetres, metre, kilometre, fractions, decimals, perimeter, approximately, distance, length, width, difference, average.

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). Examine both the ruler and the metre by asking 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 cm 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 common household items and ask your child to measure the length, height or width of each one. Encourage your child to write the lengths as fractions and decimals. For example:

- 1cm = $\frac{1}{100}$ m **or** 0·01m
- 100cm = 1m **or** 1·0m
- 110cm = $1\frac{1}{10}$ m **or** 1·1m

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, such as the distance from Longford to Cork, Dublin to London or your house to a local attraction like a castle, park or lake.

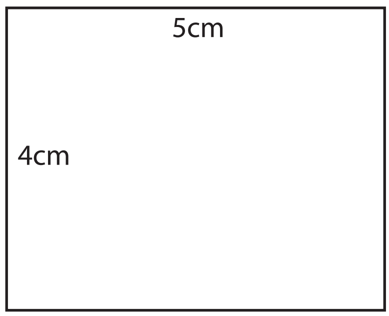
Extension 1: Walk, jog, run or cycle a kilometre with your child. Time how long it took you to travel this distance. When in the car, ask your child when s/he thinks that you have travelled a distance of 1km. Check by looking at the odometer (the meter that shows distance travelled).

Extension 2: Help your child write metres as kilometres using fractions and decimals:

1**m**	=	$\frac{1}{1000}$ **km**	=	0·001**km**
127**m**	=	$\frac{127}{1000}$ **km**	=	0·127**km**
1,000**m**	=	1**km**	=	1·0**km**
1,079**m**	=	$1\frac{79}{1000}$ **km**	=	1·079**km**

Perimeter and scale

In the picture, we have used a scale of 1cm = 1m. This means that in the drawing the sitting room measures 5cm × 4cm, but in real life it is 5m × 4m. Scale makes it easy for us to represent longer measurements or distances easily and accurately on paper. We calculate the perimeter simply by adding up the length of all the sides.



Extension 1: Help your child measure the perimeter of some small items in the house, such as a copybook, English book, seat of a chair, table, television screen, A4 sheet of paper, window, door, etc.

Extension 2: Help your child measure the perimeter of different rooms of your house using a tape measure, e.g. kitchen, bedroom, bathroom, lounge, etc.

Extension 3: Using a scale of 1cm = 1m, challenge your child to make a drawing of these rooms on paper. S/he can draw in objects when finished, such as a bed or chest of drawers, keeping to the scale!

Investigate world records

With your child, have fun researching interesting world records concerning length, such as the length of the longest snake, shortest dog, tallest mountain, tallest sunflower, longest fingernails, deepest lake, longest river, shortest car, and so on. This can be done using books such as *The Guinness Book of Records*. S/he can also use the internet under supervision.

Fractions/Decimals/Percentages 1

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 percentages: percent, percentage, fraction, decimal, units, tenths, hundredths, round, whole number, simplify, calculator, horizontal bar-line graph, pie chart, increase, decrease, lowest terms, remainders.

Fractions as percentages

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

$\frac{6}{100} = 0{\cdot}06 = 6\%$
$\frac{45}{100} = 0{\cdot}45 = 45\%$
$\frac{83}{100} = 0{\cdot}83 = 83\%$

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 fractions to hundredths, we can easily change them to decimals or percentages:

$\frac{3}{10} \times \frac{10}{10} = \frac{30}{100} = 0{\cdot}30 = 30\%$
$\frac{7}{25} \times \frac{4}{4} = \frac{28}{100} = 0{\cdot}28 = 28\%$
$\frac{1}{4} \times \frac{25}{25} = \frac{25}{100} = 0{\cdot}25 = 25\%$
$\frac{11}{20} \times \frac{5}{5} = \frac{55}{100} = 0{\cdot}55 = 55\%$
$\frac{3}{4} \times \frac{25}{25} = \frac{75}{100} = 0{\cdot}75 = 75\%$
$\frac{19}{20} \times \frac{5}{5} = \frac{95}{100} = 0{\cdot}95 = 95\%$

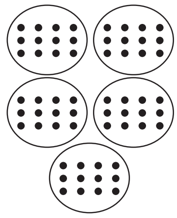
Once the denominators (numbers on the bottom of a fraction) are the same, we can add or subtract them. The children are always encouraged to simplify their answers to the smallest fraction where possible:

$20\% = \frac{20}{100} = \frac{2}{10} = \frac{1}{5}$
$75\% = \frac{75}{100} = \frac{3}{4}$
$35\% = \frac{35}{100} = \frac{7}{20}$
$60\% = \frac{60}{100} = \frac{6}{10}$
$85\% = \frac{85}{100} = \frac{17}{20}$
$36\% = \frac{36}{100} = \frac{9}{25}$
$65\% = \frac{65}{100} = \frac{13}{20}$

$12\frac{1}{2} = \frac{125}{1000} = \frac{25}{200} = \frac{1}{8}$
$37\frac{1}{2} = \frac{375}{1000} = \frac{75}{200} = \frac{3}{8}$

Finding a percentage of the whole

You will need concrete items for sharing, such as cubes, counters, marbles or coins. Explain to your child that you have 60 counters/pasta shells/1c coins in your hand and that you want to give 40% 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: $40\% = \frac{40}{100} \rightarrow \frac{4}{10} \rightarrow \frac{2}{5}$. So we must find $\frac{2}{5}$ of the 60 cubes.



Share the cubes equally into five piles (e.g. on five plates) until they are all gone. Ask your child questions such as:

- *How many cubes are in each pile? (12)*
- *Have the cubes been shared equally?*
- *So what is $\frac{1}{5}$ of 60? Yes, it's 12!*
- *If $\frac{1}{5}$ is 12, what is $\frac{2}{5}$? Yes, 12×2. So 40% of 60 = 24!*

The quick method:

$\frac{5}{5}$ = 60 coins

$\frac{1}{5}$ = 12 coins

$\frac{2}{5}$ = 24 coins

Percentage (%) extra free

When you are out shopping with your child, show him/her some of the offers that the shop or supermarket is offering 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? Yes, 4 .*
- *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.*

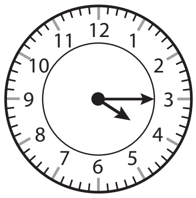
Do this type of exercise with as many items as you can, but make sure that the numbers being used are not too big. We are only interested in the child understanding the concept, at this stage.

Time

Your child will be learning about *time* in the coming days. This will be your child's first formal introduction to the relationship between time, speed and distance. S/he will also be studying international time zones for the first time. S/he will 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, seconds, time, speed, distance, total, digital, analogue, depart, arrive, return, kilometres, average, rotates, bar chart, calculator, time zones, longitude, degrees, cities around the world, countries, international date line.

Revise the 24-hour clock (am and pm) and the digital clock

Activity 1: To encourage your child's understanding of the 24-hour clock system, ask him/her to show 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.



16 : 15

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 to remember these by altering the abbreviation to 'past midday'.

Activity 2: Show a specific time on your analogue clock, e.g. 22 minutes past 7. Add in am or pm and ask your child to show the equivalent time on the digital clock, i.e. **07:22**.

Timetables

Look through timetables in magazines, newspapers or online (television timetables, bus and rail timetables, cinema guides, etc.). Ask questions to make sure that your child understands how to read a timetable:

- *At what time does the first train leave?*
- *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 of your choice to your child. Ask him/her to write four or five questions about the timetable for you or another family member to answer.

Time, speed and distance

distance ÷ average speed = time
distance ÷ time = average speed
time × average speed = distance

We are looking at three different elements here. If we know two of the elements, we can always calculate the third. Help your child understand this concept by presenting him/her with real-life problems to solve:

- *Dad cycles at an average speed of 29km/h. How long will it take him to cycle 87km? → 87 ÷ 29?*
- *We are going to Cork at the weekend. If the distance is 248km and I hope to complete the journey in $2\frac{1}{2}$ hours, what will my average speed need to be? → 248km ÷ 2·5*
- *Mam runs at an average speed of 8·4km/h, how far will she run in $3\frac{1}{2}$ hours? $3\frac{1}{2}$ → 8·4 × 3·5*

International time zones

With your child, examine the international time zone map on page 99 of Busy at Maths 6. You can also find many interactive time zone maps online.

- *Identify the lines of longitude (going north to south).*
- *Identify the line that represents Greenwich mean time (the red line). (Greenwich is a town on the outskirts of London.)*
- *Examine how the time zones are not always divided by straight lines!*
- *Identify countries or cities that lie in the same time zone as Ireland.*

Help your child interpret the map by asking simple or challenging questions such as:

- *What is the time difference between New York and Rome (6 hours)?*
- *How many time zones will you pass through if you travel west from Tokyo to Boston?*
- *If it is 13:38 in Copenhagen, what time is it in Perth, Australia? (20:38)*
- *If I leave Dublin at 16:50 and travel to New York (a journey of 7 hours), what will the local time in New York be when I land? It will be* **23:50** *in Dublin. As New York is 5 hours before us, it will be* **18:50** *there.*

Ask your child to compose some questions about the time zones.

Your child will be learning about *equations* and *variables* (an unknown number or one that can change) over the coming days. S/he needs to know some of the mathematical language associated with equations: numerals, symbols, number sentences, equal to, has the same value as, equations, balance, tilt, scales, variable, word problem, true, false, correct, incorrect, answer is, total cost, represent, symbol or letter, unknown amount, increased, decreased, sum, result, answer, fraction of the variable, difference, perimeter, rectangle, length, width, less than, greater than, letters of the alphabet.

Note: Many children don't fully understand what the equals (=) sign actually means. Some think it means: *the answer is*. Your child must understand that the equals (=) sign means: *has the same value as*.

Which operation?

Display various open number sentences with the +, −, × or ÷ signs missing. See questions 1 and 2 on page 101 of the textbook for examples. Invite your child to determine which sign makes each number sentence true. For example:

10 ○ 6 ○ 4 = 20 → 10 + 6 + 4 = 20
30 ○ 2 ○ 5 = 20 → 30 ÷ 2 + 5 = 20
50 = 7 ○ 7 ○ 1 → 50 = 7 × 7 + 1

Note: It's very important that children can translate number sentences into word problems.

What's my number?

Play the What's My Number? game with your child. Say: *I'm thinking of a number. I multiply it by 6. I take away 4. My answer is 44. What's my number?* **or** *I'm thinking of a number. I divide it by 6. I subtract 2. My answer is 40. What's my number?* Invite your child to work out the answer and explain and justify his/her reasoning. Now ask your child to make up similar questions for you to answer.

The missing number

Write various number sentences for your child, but this time omit one number. Your child must work out the missing number to make each number sentence true/correct. S/he must be able to work out the answer and explain and justify his/her reasoning. For example:

22 + 6 = 30 − □ → 22 + 6 = 30 − 2
54 ÷ 9 = 3 × □ → 54 ÷ 9 = 3 × 2

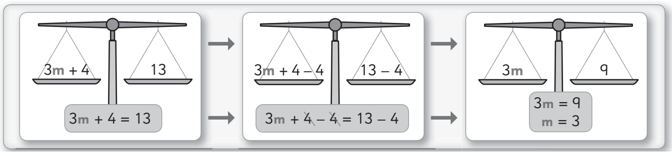
Introducing variables

Explain to your child that the **unknown** part of an equation can be represented in many ways. Invite your child to offer some suggestions as to how it may be represented: ○, □. Tell your child that it can also be represented by a symbol (for example, ✎,♥,♣,♦,♠) or a letter (a, b, c…, x, y, z). When a symbol or letter is used in place of an unknown amount, it's called a **variable**. Invite your child to write equations with any variable (symbol or letter) they wish. Invite him/her to write a word problem for the equation.

Find the value of the variable

Invite your child to solve various equations, as on pages 105–108 of the textbook. Discuss the various strategies used when solving the problems. Allow your child to justify his/her reasoning. Elicit the following rules for making both sides of the equal (=) sign:

1. Subtract the same number from each side of the equation.



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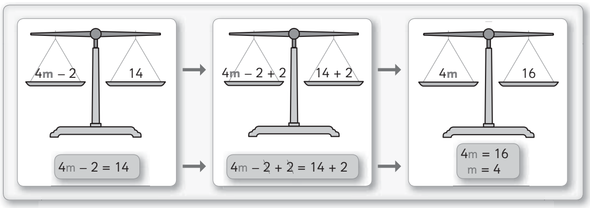
2. Add the same number to each side of the equation.



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3. Multiply each side of the equation by the same number.
4. Divide each side of the equation by the same number (except for 0).

Simple formulae

Invite your child to discuss simple formulae such as the following:

1. Area of a rectangle: a = l × w (length × width)
2. Perimeter of a rectangle: P = 2(l + b) or 2l + 2b
3. Diameter of a circle: d = 2 × r or 2r (r = radius)

Ask your child to find the area of some rectangular objects in the house using the formula e.g. table, television, window pane, door, picture frame, etc.

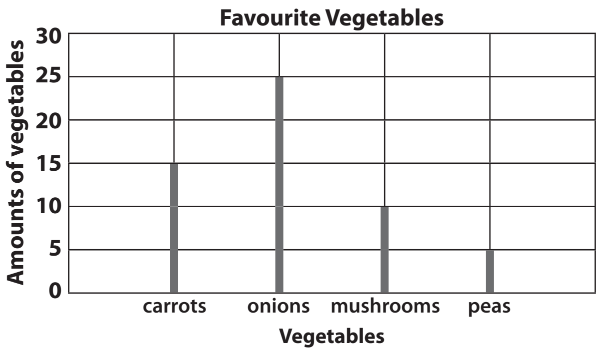
Your child will be learning to *represent and interpret data* on bar charts, multiple bar charts, bar-line graphs and trend graphs over the coming days. Trend graphs are the only new type of chart/graph to be introduced. Your child will need to read the data on graphs and charts and use this information to solve real-life problems. S/he needs to know some of the language associated with data: represent, bar chart, multiple bar chart, bar-line graph, trend graph, total, difference, data, average, more, less, above, below, increase, decrease, greatest, fewest, between, more, plot, rounded.

What do graphs and charts have in common?

All graphs and charts must have the following:

- *A title, e.g. Favourite Colour.*
- *Categories that need to be labelled, 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-line graph** of favourite vegetables. It has a scale of 1 : 5, or 1 to 5.

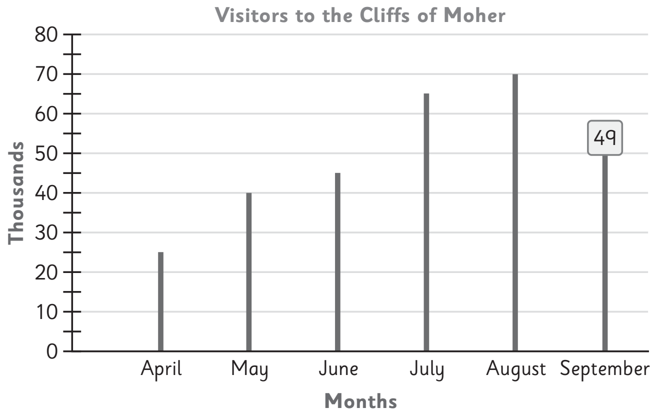


Ask your child questions such as the following to help him/her interpret the data that is represented in the bar-line graph:

- *What is the title of this bar-line graph?*
- *What is the scale of this bar-line graph?*
- *How many categories were there to choose from? Name them.*
- *Which vegetable is most/least popular?*
- *How many people voted for carrots?*
- *How many people altogether voted in this survey?*
- *How many more people voted for onions than peas?*
- *How many fewer people voted for peas than carrots?*

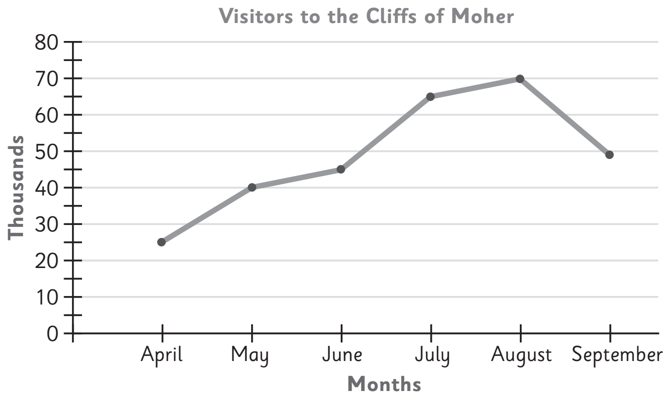
Extension: Encourage your child to collect data about favourite food/drink/car/sport (or any other favourite your child might prefer) from family members and friends. The information should be represented on a bar-line graph using A4 paper. The scale will be determined by the number of people who take part in the survey.

Trend graphs



This bar-line graph shows the number of visitors to the Cliffs of Moher over 6 months.

The information on the bar-line graph can be placed on a **Trend graph**. The flow of the lines on the trend graph shows us whether the trend is increasing or decreasing.



Ask your child the following questions.

(a) In which months did the number of tourists increase on the previous month (June, July, August).

(b) In which month was there a decrease in the number of visitors over the previous month (September).

(c) Why do you think that there were more visitors to the cliffs in August than April?

(d) Do you think the downward trend will continue for the month of October? Why?

Extension : Encourage your child to collect any data from a family member over several days for a trend graph, e.g. length of time spent exercising/on household chores/reading.

Your child will be learning more about *fractions, decimals* and *percentages* over the coming days. This is an extension of the work started in Chapter 18. Your child will continue learning about the direct link between fractions, decimals and percentages. Your child needs to know some of the mathematical language associated with percentages: percent, percentage, fraction/decimal method, units, hundredths, whole number, simplify, calculator, bar graph, lowest terms, most, least, remainders, express, change, simplify, calculate, temperature, original price/amount, reduce, reduction.

Fractions as percentages

Ask your child to change the following fractions to decimals and percentages:

$\frac{7}{100} = 0{\cdot}07 = 7\%$
$\frac{65}{100} = 0{\cdot}65 = 65\%$
$\frac{43}{100} = 0{\cdot}43 = 43\%$

Your child has already learned that other fractions can be changed to equivalent fractions (fractions that look different but have the same value). So, by changing a fraction to hundredths, we can easily change them to decimals or percentages:

$\frac{7}{10}$	×	$\frac{10}{10}$	=	$\frac{70}{100}$	=	0·70	=	70%
$\frac{3}{25}$	×	$\frac{4}{4}$	=	$\frac{12}{100}$	=	0·12	=	12%
$\frac{3}{4}$	×	$\frac{25}{25}$	=	$\frac{75}{100}$	=	0·75	=	75%
$\frac{9}{25}$	×	$\frac{4}{4}$	=	$\frac{36}{100}$	=	0·36	=	36%
$\frac{3}{5}$	×	$\frac{20}{20}$	=	$\frac{60}{100}$	=	0·60	=	60%
$\frac{17}{20}$	×	$\frac{5}{5}$	=	$\frac{85}{100}$	=	0·85	=	85%

Note 1: Your child must be able to use a calculator when working with percentages.

Note 2: When converting fractions such as $\frac{1}{3}$ using a calculator, there is no facility for showing recurring decimals where a black dot is usually above one of the numbers that come after the decimal point, e.g. 0·33333 → $0{\cdot}3\dot{3}$. Consequently, it's best to simply allow your child to stop after two places of decimals, e.g. $\frac{1}{3} = 0{\cdot}33$, $\frac{2}{3} = 0{\cdot}66$.

Note 3: When working with percentages, you don't have to press the [=] key on most calculators. The answer should appear after you press the [%] key.

Increase and decrease

Pose the question: *I want to increase 72 by 6%*. If we want to increase a number by 6%, we must find 106%, as the full original amount was 100%.

Press [7], [2], [×], [1], [0], [6], [%] and the calculator will show 76·32.

So, 72 increased by 6% = 76·32.

Pose the question: *I want to decrease 84 by 8%*. If we want to decrease a number by 8%, we must find 92%, as the full original amount was 100%.

Press [8], [4], [×], [9], [2], [%] and the calculator will show 77·28.

So, 84 decreased by 8% = 77·28.

Change fractions to percentages

This game is best played in groups of three. Ten-sided dice are preferable for this activity if you have them, as the fractions are easy to convert to decimals. One member of the group acts as scorekeeper and referee. Player A rolls two dice and must make a fraction. The higher number is used as the denominator. Player A has to convert the answer to a percentage. Player B then throws the dice and proceeds as with Player A. The player with the bigger percentage after each go is the winner and receives a cube or counter. The player with the most cubes or counters after a specified number of goes is the winner.

Extension: Play as above but use six- or nine-sided dice to make the fractions. You can convert the fractions to percentages by dividing the numerator (top number) by the denominator (bottom number). For example, if Player A throws a 5 and a 9, this is written as $\frac{5}{9}$ → 5 ÷ 9 = 0·5555, so the answer as a percentage will be 55·5%. This works for all fractions being converted to percentages.

Change fractions to percentages

This game allows your child to convert more difficult fractions to decimals or percentages using the calculator. It's best played in groups of three. One member of the group acts as scorekeeper and referee. Remove all the picture cards from a deck of cards, leaving only the cards 1–10. Player A is dealt two cards from the deck and turns them over. S/he must make a fraction using the two cards. The higher number is used as the denominator. S/he now has to convert the answer to a percentage. Player B is then dealt two cards and proceeds as for Player A. The player with the bigger percentage after each go is the winner and receives a cube or counter. The player with the most cubes or counters is the winner.

Directed numbers

Your child will be learning about *directed numbers* over the coming days. These were first introduced on Home/School Links Sheet 23 in 5th Class. S/he needs to know some of the mathematical language associated with directed numbers: negative numbers, minus, positive numbers, plus, above, below, under, debit, ago, temperature, ground level, thermometer, degrees Celsius, freezes, boils, average, hottest, coldest, difference between, highest, lowest, increasing, decreasing, positions, wins, draws, losses, goals for, goals against, goal difference, won, lost, drawn, surface, above/below sea level, speed limit, gains places, loses places, kilometres per hour, forwards, backwards, metres, deeper, account, overdrawn/in the red, lodge, withdraw, interest, transaction, amount, balance, represented, zero pairs, BC (Before Christ), AD (Anno Domini), timeline, earliest, latest, time difference.

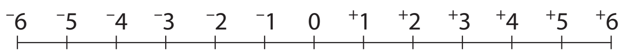
Definitions

A positive number is greater than zero and is written with a positive (+) sign: $^{+}6$.

A negative number is less than zero and is written with a negative (–) sign: $^{-}3$.

Counting activity 1: Number line

Invite your child to count forwards and backwards on the number line below, or you and your child could make a larger number line. Discuss which numbers have the greater value, for example $^{-}2$ or $^{-}6$.



Counting activity 2: Calculator fun

Invite your child to press [1] [0], followed by the [–] sign, followed by [1] [=] [=] [=] [=] on the calculator. Invite your child to note what happens to the digits that follow [0] on the screen: → they have a minus sign in front of them to show that they are *negative* numbers.

Activity 1: Floor levels

Study the lighthouse on page 120 of your child's textbook. Elicit from him/her, if possible, the reason why there is a $^{+}$ symbol in front of some of the numbers on the lighthouse levels and a $^{-}$symbol in front of other numbers. (The $^{+}$symbol is in front of the numbers above sea level to show that they are positive numbers. The $^{-}$symbol is in front of the numbers below sea level to show that they are negative numbers.)

Negative numbers are often used in different everyday situations. Invite your child to identify where negative numbers are used in real-life situations, e.g. lifts, golf scores par/over par/under par, temperatures on thermometers, movement of records in music charts, in history (AD and BC), etc.

Activity 2: Temperature

Explain to your child that 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.

Discussion: 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, negative numbers get bigger.

Look up the temperatures of different cities or towns in Ireland on a particular day. You could also get these from the weather forecast on the television. Display a map of Ireland and discuss which temperatures of cities/towns are above/below zero, which temperature is the coldest/warmest, what is the difference between the temperature in Dublin and Cork, and so on. Tell your child that the following week, the temperatures dropped/increased by 3°C and ask: *What was the temperature of each city then?*

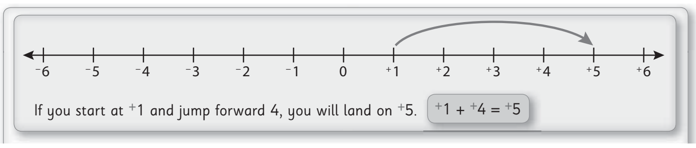
Activity 3: Adding and the number line

Make a number line like the one shown above.

Number line procedure:

1. Always start at zero, then locate the first number.
2. Move right to add a positive number.
3. Move left to add a negative number.

Pose the following problem: The temperature in Athlone was $^{-}3$ this morning. It rose by 4°C by midday. What temperature was it at midday? $^{-}3 + {}^{+}4 = ?$



$^{-}3 + {}^{+}4 = 1$

Negative three plus positive four equals one.

Invite your child to solve various other addition problems on the number line, such as: $^{+}4 + {}^{-}3 + {}^{-}2 = ?$

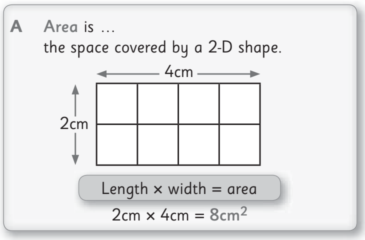
CJFallon

Your child will be learning about *surface area* and *perimeter* over the next few days and weeks. Your child needs to know some of the language associated with surface area: area, space, 2-D shape, perimeter, distance, length, width, height, add, shapes, rectangles, squares, measure, surface, calculate, total, cuboids, grid, ares, hectares, metre stick, trundle wheel, ruler.

Definitions

Surface area is the amount of space covered by a 2-D shape.
Perimeter is the distance around the sides of a 2-D shape.

Calculating the area of regular 2-D shapes



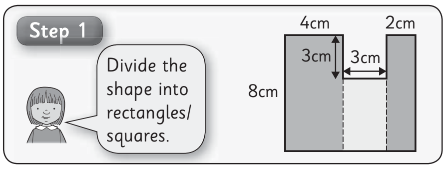
Through exploration at school (and home!), your child will discover the rule to quickly calculate the area of rectangles and squares:

Rule: area = length × width **or** area = 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, seat of a chair, television screen, window pane. Help your child estimate and measure the length and width of each object. Finally, invite your child to calculate the actual area of each object in centimetre squares (cm^2).

Extension: Encourage your child to calculate the perimeter of each object and to work out a quick way to do it. Add the length and width and multiply by 2 ➞ $(l + w) \times 2$.

Calculating the area of irregular shapes



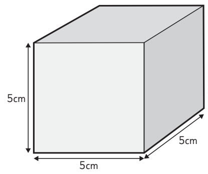
Your child will need to calculate the area of shapes that are not so neat.

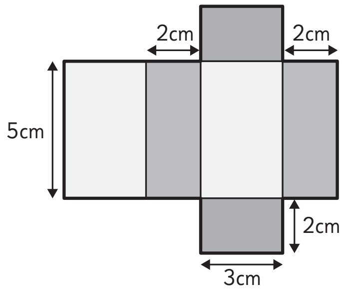
Look at the shape above:

Your child must divide the shape into 'easier' shapes (rectangles and squares). Calculate the area of each of the easier shapes. Then combine the areas to calculate the total area.

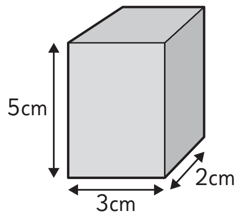
Surface area of 3-D shapes

To calculate the surface area of a cube, we just calculate the area of each of the six faces. Given that the six faces are identical, we can simply find the area of one face and multiply by 6 to find the total surface area!





Calculating the surface area of a cuboid is trickier. Flattening the shape into its **shape net** helps. We can see that there are three pairs of identical faces. If we calculate the area of each of the three different faces (multiplying the length by the width), we will find the surface area of half the cuboid. Multiplying by 2 will give us the total as the opposite sides are equal.



Extension: Ask your child to draw the cuboid net and make it into a cuboid. Ask him/her to colour the equal sides before finding the area of the complete cuboid.

Square metres, ares and hectares

Square metres, ares and hectares are closely linked.

1 are = $100m^2$
1 hectare = 100 ares

To help your child understand these areas, complete the following activities:

1. Measure $1m^2$ using a metre stick or measuring tape. This is a square that has a length of 1m and a width of 1m. Explain to your child that 100 of these square metres is the same as 1 are.
   Similarly, 100 ares = 1 hectare.
2. Look for online images of spaces that are approximately $1m^2$, 1 are and 1 hectare.

Note: The acre (often used by farmers) is much more commonly used than the are, but an acre is not a metric unit. The relationship between acres and m^2 is much more difficult: 1 acre = 4,047 m^2!

CJFallon

Your child will be learning more about *fractions, decimals and percentages* over the coming days. This is an extension of the work begun in Chapters 18 and 22 of the textbook. S/he will continue learning about the direct link between fractions, decimals and percentages. Your child needs to know some more of the mathematical language associated with percentages: percent, percentage, fraction, decimal, units, hundredths, round, whole number, simplify, calculator, pie chart, lowest terms, remainders, express, change, simplify, terms, calculate, cost price, selling/ sale price, original price, normally priced, profit, loss, plus, minus, discount, discounted, reduced, amount.

Increase and decrease

Note: This is a quick revision of work done earlier.

Pose the question: *I want to increase 84 by 8%*. If we want to increase a number by 8%, we must find 108%, as the full original amount was 100%. Press [8], [4], [×], [1], [0], [8], [%] and the calculator will show 90·72.

So, 84 increased by 8% = 90·72.

Pose the question: I want to decrease 74 by 7%. If we want to decrease a number by 7%, we must find 93%, as the full original amount was 100%. Press [7], [4], [×], [9], [3], [%] and the calculator will show 68·82.

So, 74 decreased by 7% = 68·82.

Profit and loss

Part A:

Write a price of €320 on a Post-it note or small piece of paper. Ask your child to place the price tag on an item in the house, e.g. television, cooker, fridge. Pose the question: *A television was on offer for €320. During a sale the price was reduced by 20%. What was the price of the television during the sale?*

Ask questions such as the following:

- *What is the marked price of the television?*
- *Is it actually on sale for €320? Why? Why not?*
- *What is the percentage discount? Yes, 20%.*
- *Will the television cost more or less to buy now?*
- *What is another name for 20%? Yes, $\frac{1}{5}$.*
- *What percentage was the television on sale for originally? Yes, 100%, or $\frac{5}{5}$.*
- *What percentage of the original price will the television now go on sale for? Yes, 80%, or $\frac{4}{5}$.*
- *So we must find 80% or $\frac{4}{5}$ of €320.*

Note: It's usually easier to find a percentage using fractions.

Method 1:

Original price → $\frac{5}{5}$ = €320

Discount → $\frac{1}{5}$ = €64

Now let's subtract the discount: €320 – €64 = €256.

Method 2:

Original price → $\frac{5}{5}$ = €320

Discount → $\frac{1}{5}$ = €64 (divide €320 by 5)

New price → $\frac{4}{5}$ = €256 (multiply €64 by 4)

Do this with the other items using different prices.

Part B

Ask your child to place a price tag of €480 on the fridge and pose the following problem: *A shopkeeper bought a fridge and wants to sell it at a profit of 10%. What must the selling price be?*

Emphasise that you are the shopkeeper and that you want to sell this fridge to your child for a profit. Ask questions such as the following:

- *What did I (the shopkeeper) pay the factory for the fridge? Yes, €480.*
- *Will I sell it for that amount? Why? Why not?*
- *Will I sell it for more or less than I paid for it?*
- *What percentage of the cost price did I pay for the fridge? Yes, 100%, or $\frac{10}{10}$.*
- *Will I charge more or less for the fridge than I paid for it?*
- *What percentage profit do I want to make? Yes, 10%.*
- *So we must find 110%, or $\frac{11}{10}$.*

Note: Again, it's easier to find a percentage using fractions.

Method 1:

Original price → $\frac{10}{10}$ = €480

Profit → $\frac{1}{10}$ = €48

Now let's add on the profit: €480 + €48 = €528.

Method 2:

Original price → $\frac{10}{10}$ = €480

Profit → $\frac{1}{10}$ = €48 (divide €480 by 10)

New price → $\frac{11}{10}$ = €528 (multiply €48 by 11)

Do this with other items in the house. Your child can play the role of shopkeeper and try to work out what s/he needs to sell items at in order to make a profit of 20%, $12\frac{1}{2}$%, 40%, etc.

CJFallon

Money

Your child will be dealing with *money* over the coming days. S/he will continue to learn about calculating bills and finding value for money by comparing prices. This is a very important skill to teach your child so that s/he is aware of the best value when shopping. For the first time, s/he will be learning about interest rates, Value Added Tax (VAT) and foreign exchange rates. S/he will also be looking at keeping track of a household bank account. S/he needs to know some of the mathematical language associated with money: euro, cent, Value Added Tax (VAT), interest (simple), rates, foreign currency/exchange, dollar, yen, sterling, krone, franc, rand, special offer, calculate, convert, household budget, bank accounts, deposit, savings, transactions, salary, discount, repayment, loan.

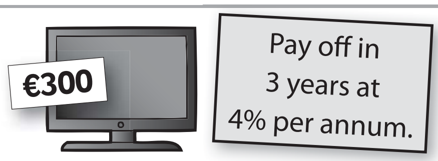
Shopping trips

Bring your child with you to help with the grocery shopping in the supermarket.

Activity 1: As you walk through the aisles, ask your child to look for the prices of the items you want to buy. Encourage him/her to round the price of each item to the nearest euro or 50c. 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 for special offers that involve multipacks, special offers and money-off vouchers. Explain to your child that some offers are not always as good as they may appear. Give your child a calculator and encourage him/her to calculate the prices of individual items and similar items that come in packs of two, three, six, etc. Ask him/her to decide which products or packs offer the better/best value for money.

Interest



With your child, discuss how people sometimes take out a loan to pay for an item or service. Loans usually have interest charged to them on a yearly basis. By the time the loan is paid off, the customer will have paid back **much more** than the price of the original item. On the otherhand, when we invest money in a bank or financial institution, we can earn interest on the money that we place on deposit.

Activity 1: When you are out shopping with your child, look for in-store offers of loans on items such as furniture, holidays, electrical goods and cars. Encourage your child to calculate the total amount to be paid back, if you take out a loan for one, two or five years. (We only deal with simple interest at this stage. We don't expect the children to work out compound interest, which involves paying/getting interest on the loan as well as interest on the actual interest in the second and following years.)

Activity 2: Look up the interest rates offered by financial institutions on investments. Help your child calculate how much they would make on investing €100 for three years at that interest rate (use simple interest again).

Value Added Tax (VAT)

Explain to your child that many items and services that we pay for have a tax added onto them, which increases the price for the customer. This tax goes to the government. This money helps to run the country, e.g. it pays for hospitals, schools etc. Not all items and services are taxed at the same rate. Some items and services, such as food and children's clothes, are exempt from VAT altogether.

Activity 1: Look for VAT payments on receipts and price tags. Check the percentage of VAT that is placed on the items and services.

Activity 2: Discuss why some shops choose to advertise the prices of items *not inclusive of VAT*. When you find such items, help your child calculate the total cost of the item or service that you must pay.

Foreign exchange rates

Explain to your child that not every country uses the same currency (type of money). Some countries share a common currency, such as the euro. Some currencies are stronger or weaker than others. For example, for €1 you might be able to buy US$1·25, but you might only be able to buy £0·78 (sterling/pound). These exchange rates are always changing.

Activity 1: Research different currencies used by different countries.

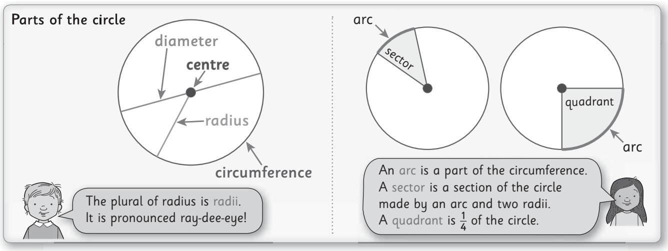
Activity 2: Research all the countries that use the euro.

Activity 3: Look up current exchange rates in the paper or on the internet. Help your child calculate how much of each currency s/he would get for €100 or €250 and vice versa.

CJFallon

Your child will be learning about *the circle* in much greater detail than in Chapter 10 (2-D Shapes) over the coming days. S/he needs to know some of the mathematical language associated with the circle: circle, centre, circumference, radius, radii, diameter, sector, quadrant, arc, straight lines, perimeter, $\frac{1}{4}$, right angle, straight angle, protractor, length, shorter, combined, compass, ruler, swivel, point, estimate, area, centimetre squares (cm^2), approximate, full, half, more/less, construct, cost, discount, pattern, continue, small, medium, large, extra large.

Properties of a circle



Activity 1:

Have your child label the different properties of the circle on a paper plate. (If you don't have a paper plate, ask your child to place a large, circular plate on a piece of paper. Trace around the plate to make a circle, then ask him/her to cut out the circle.)

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

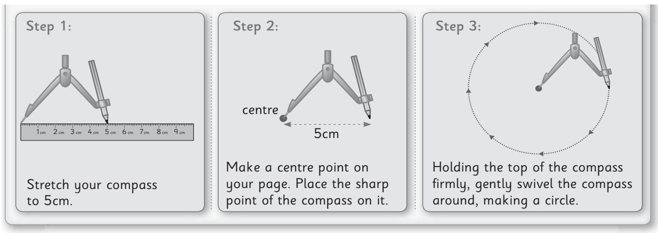
Circle hunt

With your child, search for as many different circular shapes and objects around the home as you can find, e.g. CDs, plates, mirrors, clock, bowls.

Activity 2: Help your child measure the radius and diameter of each circle.

Activity 3: Encourage your child to trace around the different circular objects to create 2-D circles. S/he can then make a pattern or design using the circles.

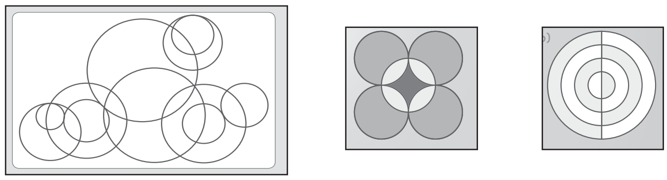
Using a compass



Many children find it difficult to use a compass. Encourage your child to be extremely careful when using a compass – it can be a dangerous implement! Help your child use a compass properly by doing the following:

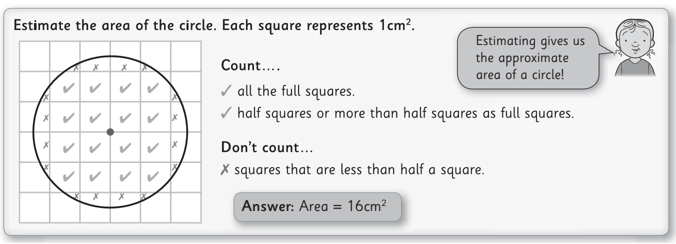
1. Place a sharpened pencil into a compass and secure it tightly.
2. Stretch the compass as wide as you wish – this will determine the length of the radius.
3. Place a small amount of pressure on the point of the compass.
4. Pinching the top of the compass with your thumb and index finger, swivel the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

Invite your child to make interesting circle patterns and pictures similar to the following.



Approximate area of a circle

Encourage your child to draw circles onto centimetre square paper (copybook squares will work equally well, but emphasise that each square represents $1cm^2$). To find the approximate area, s/he simply counts up all the complete squares. S/he needs to count all parts of squares that are at least half of a full cm^2.



Measuring the circumference of a circle

Your child will work out a formula for calculating the circumference of any circle, which is: diameter $\times$ 3·14.

CJFallon

Rules and properties - pattern

Your child will be learning about *rules and properties* over the coming days. S/he needs to know some of the mathematical language associated with rules and properties: copy, extend, devise, predict, pattern, repeated pattern, 10th/15th element of the pattern, Fibonacci poem, preceding numbers, syllables, triangular numbers, Kaprekar number, squared, answer, reverse, subtract, terms of a sequence, relationship, minus, addition, subtraction, multiplication, division, multiply, brackets, solve, operations, invested, worth, value, discount, profit, investment, money, coins, 2-D shapes (circles, square, rectangle, triangle, hexagon, semi-circle, oval, rhombus, pentagon, octagon), 3-D shapes (cube, cuboid, cylinder, cone, sphere, triangular prism, pyramid, tetrahedron, octahedron), sequence, multiples, strategy, sequence, number facts.

Fibonacci sequence

Invite your child to research the Italian mathematician Fibonacci in books or on the internet (under supervision). Display his sequence 1, 1, 2, 3, 5, 8… and invite your child to discuss it, record the rules and extend the pattern further.

Note: The rule is that each number is equal to the sum of the preceding two numbers. He always used the first number twice: 1 + 1 = 2; 1 + 2 = 3; 2 + 3 = 5 and so on.

Fibonacci poem (or Fib)

Read and discuss the Fibonacci poem on page 151 of your child's textbook. It's a poem based on the Fibonacci sequence. The number of syllables (separate sounds) in each line equals the total number of syllables in the preceding two lines. Count the number of syllables in each line. Check that the poem keeps to the Fibonacci sequence. Invite your child to find other Fibonacci poems on the internet (under supervision). Count the number of syllables in each line. Check that the poem keeps the Fibonacci sequence.

D.R. Kaprekar number

Invite your child to research the Indian schoolteacher D.R. Kaprekar. When a number is squared, if the answer can be split into two parts that add up to the original number again, it's a Kaprekar number.

Examples:

9^2 = 81 and (8 + 1) = 9

999^2 = 998,001 and (998 + 1) = 999

$2{,}728^2$ = 7,441,984 and (744 + 1,984) = 2,728

Invite your child to discuss various numbers and decide whether or not they are Kaprekar numbers. S/he can use a calculator for this activity.

What's 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 him/her to decide what's missing and to explain his/her reasoning.

Pattern detective

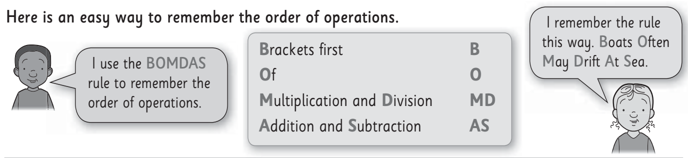
Ask your child to examine patterns from your own or the local environment, e.g. wallpaper, gift-wrapping paper, socks, striped jumpers. Discuss the pattern and draw attention to the way it's repeated.

Order of operations

Invite your child to solve the following:
3 + 8 × 6 – 2 = ☐. Discuss possible solutions, e.g. 64, 49. Invite your child to explain why there might be different answers (incorrect answers). Tell your child that long ago, mathematicians came up with the order for us to solve the different operations in an equation to make sure that everyone got the same, correct answer.

Order of operations

This will help you remember the order:



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Example 1: Brackets first!
(5 × 6) – 4 = 30 – 4 = 26 ✓
(5 × 6) – 4 = 5 × 2 = 10 ✗

Example 2: Multiply or divide before adding or subtracting!
60 – 5 × 7 = 60 – 35 =25 ✓
60 – 5 × 7 = 55 × 7 = 385 ✗

Example 3: Multiplication and division rank equally, so the order is from left to right!
60 ÷ 5 × 3 = 12 × 3 = 36 ✓
60 ÷ 5 × 3 = 60 ÷ 15 = 4 ✗

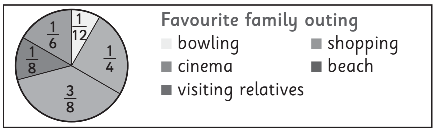
Use these rules to help your child complete some of the equations on pages 152–155 of the textbook.

Your child will be learning to *represent and interpret data* and *construct pie charts* over the coming days. S/he will need to know some of the language associated with data: pie chart, favourite, survey, data, represent, fraction, vote, altogether, key, percentage, calculate, degrees, sector, compare, protractor, total, average, calculate, recorded, table, multiple, average, above, below.

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 has an angle within the circle stretching out from the centre. 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 given a different colour. The colour is always explained in a *colour key to* make it easier to identify what each sector represents.

Look at this pie chart of favourite family outings. You will find the colour version on page 159 of the textbook.



- *How many sectors are in the circle?*
- *What fraction of people voted for bowling/shopping/ cinema?*
- *How many degrees are represented in the shopping sector?*
- *How do we find the number of degrees for shopping? (Divide the number of degrees in a circle by 4, e.g. 360 ÷ 4 = 90°.)*
- *How do we find the number of degrees for going to the beach? (360 ÷ 8 = 45°.)*
- *If 144 people voted in the survey, how many people voted for shopping/beach/etc.?*

Search for pie charts

Look for examples of pie charts in magazines, newspapers and online (under supervision). Discuss and examine them with your child and ask questions such as:

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

Constructing a pie chart

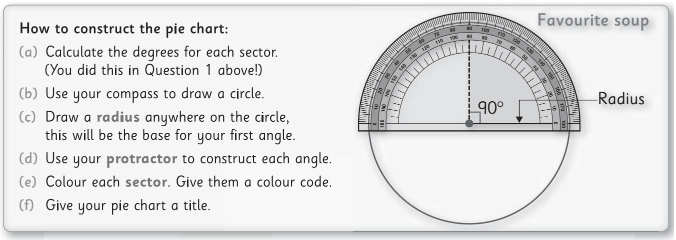
To construct a pie chart, your child must calculate how many degrees there will be in each sector. Look at the following example.

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

To calculate the degrees, we must do the following:

1. Calculate the total number of votes: 15 + 20 + 10 + 15 = 60.
2. Now place the number of votes for each category over the total, e.g. vegetable soup = $\frac{15}{60} = \frac{1}{4}$.
3. Now calculate how many degrees there are in $\frac{1}{4}$ of a circle: 360° ÷ 4 = 90°.
4. Now place the number of votes for chicken soup over the total, e.g. chicken soup = $\frac{20}{60} = \frac{1}{3}$.
5. Now calculate how many degrees are there in $\frac{1}{3}$ of a circle: 360° ÷ 3 = 120°.

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



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.

Now complete the pie chart with your child and discuss the outcomes, e.g.

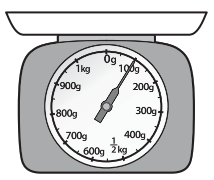
- *Which soup was most popular?*
- *Which soup was least popular?*
- *How many degress were allocated to tomato soup?*
- *How many degrees were allocated to vegetable soup?*
- *What fraction of the pie chart was taken up by potato and leek soup?*

CJFallon

Weight

Your child will be dealing with *weight* (metric) over the coming days. S/he will learn about units of measure, including the gramme (g), kilogramme (kg) and for the first time, the tonne (t). S/he will learn about the different and best tools and instruments for weighing items.
S/he will be learning how to express grammes as both fractions and decimals of a kg. 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 the metric system: weigh, weight, measure, estimate, scales, balance, gramme (g), kilogramme (kg), tonne (t), recipe, cost, heaviest, lightest, sold, unsold, dozen, change, calculate.

Scales



kitchen scales

Try to get your hands on a kitchen scales. However, a digital scales would be even better, as it's very accurate, particularly when weighing light objects. Encourage your child to estimate and weigh a variety of objects from around the home, e.g. a strawberry, 3 apples, banana, spoon, €1 coin, €5 note, mug, pot, scissors, book, tin of beans/ peas, etc.

Extension 1: Ask your child to determine the difference in grammes between the estimate and the actual weight of each object weighed.

Extension 2: 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
750g	$= \frac{75}{100}$	or	0·75kg
1,273g	$= 1\frac{273}{1000}$ kg	or	1·273kg

Baking

Together with your child, follow a simple recipe to bake an item of your choice, e.g. banana muffins, bread, a cake, gingerbread, pancakes, a small birthday cake. These can be sourced on the internet if you don't have a recipe of your own. Encourage your child to measure out the ingredients needed using a traditional kitchen scales or a digital scales.

Tonne

A tonne is a weight equal to 1,000kg. Help your child to try to understand this weight by asking him/her to hold 1kg (such as a full bag of sugar or flour). Now encourage your child to imagine holding 1,000 of these! It would be very heavy.

Extension 1: With your child, research objects that weigh about one tonne and more than one tonne. S/he can use books or the internet (under supervision).

Extension 2: Encourage your child to write the following weights as fractions and as decimals:

1,000kg	= 1·0t	
980kg	$= \frac{980}{1000}$	= 0·98t
2,300kg	$= 2\frac{3}{10}$ t	= 2·3t
3,500kg	$= 3\frac{500}{1000}$ t	= 3·5t
6,750kg	$= 6\frac{750}{1000}$ t	= 6·75t

Shopping trip

Bring your child to the supermarket when you go shopping. When picking out fruit or vegetables, encourage him/her to estimate the weight of specific items, e.g. a bunch of bananas, 3 apples, 6 oranges, 1 pineapple. Let your child weigh the items and place the stickers on the fruit and vegetables.

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

Extension 2: The weight is usually labelled on most supermarket products. Ask your child to find items in the shop with a specific weight.

Investigate world records

With your child, have fun researching interesting world records that involve weight, e.g. the weight of the heaviest dog, man, orange, car, ship, potato, pie.

Extension: You and your child might like to study the different weights in boxing or wrestling competitions.

Boxing Weights:

Flyweight: 50·802kg; Bantamweight: 53·525kg;
Featherweight: 57·153kg; Lightweight: 61·235kg;
Welterweight; 66·678kg; Middleweight; 72·574kg;
Cruiserweight; 90·892kg; Heavyweight; over 90·892kg

Note: There are other weight levels between these given weights.

Your child will be learning more about *3-D shapes* over the coming days. This will be done by means of games and activities using concrete materials. Your child will be revising some of the work done in 5th Class. S/he will need to know some of the language of 3-D shapes: 3-D, flat, solid, edges, sides, dimensions, length, width, height, vertex/vertices, pyramid, cube, cuboid, cylinder, sphere, triangular prism, pentagonal, hexagonal, octagonal, dodecahedron (12-sided), icosahedron (20-sided), polyhedron, polyhedra, tetrahedron, perspective.

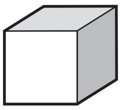
Notes:
- 3-D shapes have three dimensions: length, width and height (depth).
- Width is also commonly known as breadth.
- 2-D shapes are flat, so they can't be held.
- 3-D shapes are solid and can be held.
- A *vertex* is a corner of a 3-D shape. The plural of the word vertex is vertices.
- The vertex at the top of a pyramid has a special name: *apex*.

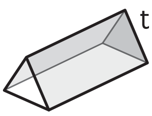
There is considerable international debate concerning edges and faces of 3-D shapes. Some educationalists believe that faces and edges can only be flat, which would mean that a sphere (ball) has no face.
In the Busy at Maths series, we assert that a face/edge can be flat or curved. Using this logic, a sphere has one curved face and a hemisphere has two faces: one flat and one curved.

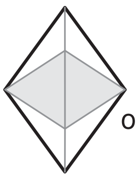
- A **sphere** can be cut into **two halves**.
- Each half is called a **hemisphere**.

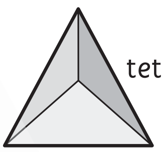
Shapes your child needs to know

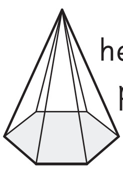

cuboid

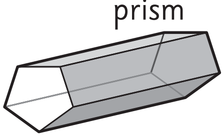

cube


triangular prism


octahedron


tetrahedron


hexagonal pyramid

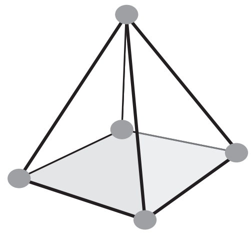

pentagonal prism

Notes about these shapes:
- A *tetrahedron* is another name for a triangular pyramid.
- *Prisms* have straight sides only.
  They are named after the 2-D shape of their base.
- An *octahedron* is formed by joining two square pyramids together.
- A *polyhedron* is any 3-D shape that has flat faces and straight edges.

Activity 1: Encourage your child to describe each of the shapes in the grid on page 169 of the textbook by asking questions such as:

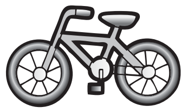
- *How many faces/edges/vertices does the cube have?*
- *Can the shape roll/stack/slide?*
- *Name some examples of these shapes that can be found in the environment.*
- *Is the shape a polyhedron (any 3-D shape with flat faces and straight edges)?*

Activity 2: Encourage your child to construct models of the different 3-D shapes using materials such as cocktail sticks, pipe cleaners, headless matches, play dough, plasticine, etc.

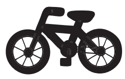


Perspective

Your child will be introduced to the concept of *perspective* for the first time in 6th Class. Perspective means looking at an object from different views.




front


side


top

Activity 1: Take a regular object from the home, e.g. a mug (like the second picture in question 1 on page 171 of your child's textbook). Encourage your child to draw the object three times, each time showing a different view: front, side and top.

Activity 2: Encourage your child to draw *trickier* objects showing the three different views (perspectives). e.g. a car, slide, house, cone or kettle.

Note: This is like shining a torch on an object and viewing the shadow.

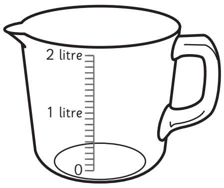
CJFallon

Capacity

Your child will be learning about *capacity* (the measure of the amount of liquid that a container can hold) over the coming days. The concept of *volume* – the amount of space taken up by a solid object – is also introduced for the first time. Your child needs to know some of the language of capacity: capacity, liquid, containers, estimate, measure, litre (l), millilitre (ml), amounts, decimals, fractions, length, width, height (depth), volume, shapes, formula, calculate, bought, largest, smallest, addition, subtraction, multiplication, division.

Using a measuring jug

Your child will need a measuring jug (a normal kitchen measure will do), water and containers of different shapes and sizes.



Ask your child to measure out different amounts of water, e.g. pour 100ml/two-fifths of a litre / 0·5l / 300ml / 850ml into the jug.

Extension: Encourage your child to write the following capacities as fractions and decimals:

1ml	=	$\frac{1}{1000}$ l	or	0·001l
24ml	=	$\frac{24}{1000}$ l	or	0·024l
700ml	=	$\frac{7}{10}$ l	or	0·7
1,476l	=	$1\frac{476}{1000}$ l	or	1·476l
3,500l	=	$3\frac{500}{1000}$ l	or	3·5l
8,250l	=	$8\frac{250}{1000}$ l	or	8·25l

Capacity v Volume

Capacity: The capacity of the jug above is 2l (litres). Capacity is the term used to describe how much the jug is capable of holding.

Volume: When the jug is full, it holds 2 litres of water/ milk, etc. The volume of water in the jug will be 2 litres.

What is the capacity of this container?

Find a selection of containers used in your home, e.g. bowl, cup, spoon, jug, pot, kettle, jar, butter tub, shampoo bottles, eggcup, kettle. Remove any labelling that shows the capacity of the containers. 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 from the actual measures. You might be amazed by the actual results! Sometimes the shape of the bottle tricks us into thinking that there is more or less in the container than it would seem.

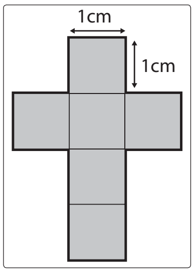
What does 200ml look like?

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 in reality. Now pour out the 200ml and remove the measuring jug from view. 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 measuring jug to see how close each estimate was to the real measure.

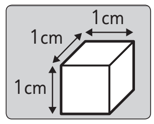
Volume

Volume is the space taken up by a 3-D shape. Help your child understand volume by asking him/her questions such as: How many pasta shells (or other small and plentiful object you might have around the house) do you think will be needed to fill a lunch box, a cup, a mug, a flower pot, a pencil case, etc.? Once your child has estimated, ask him/her to measure out the actual number needed.

For measuring the volume of 3-D shapes, we need to standardise the units of measurement. For this, we use 1cm cubes ($1cm^3$). For larger spaces, we use metre cubes (m^3).

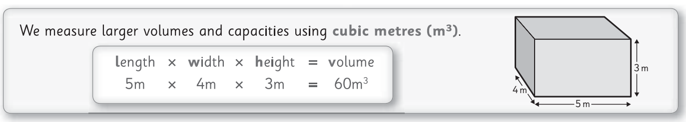


Help your child understand volume by drawing this cube template to scale and forming it into a 1cm cube ($1cm^3$). This will give your child an understanding of the actual space taken up by a ($1cm^3$) cube.



In 6th Class, your child will be learning how to measure the volume of cubes and cuboids. Look for some small cuboids around your home, e.g. a lunch box, casserole dish or a jewellery box. With the ($1cm^3$) to hand, encourage your child to estimate the actual volume of each cuboid.

There is a simple formula for calculating the volume of a cuboid: length × width × height.



CJFallon

Chance

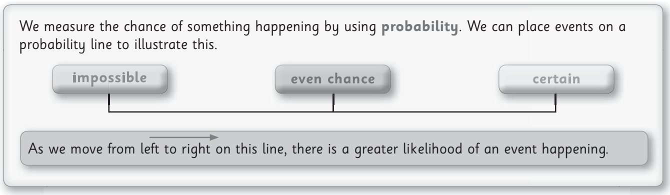
Your child will be dealing with *chance (probability)* over the coming days. Probability or chance is a measure of the likelihood or possibility of a particular event actually taking place. Your child will need to know some of the language associated with chance: even chance, impossible, possible, certain, probability, likelihood, chance/chances, possible outcomes, right, left, fractions, decimals, percentages, probability lines, experiment, multiples, digit card, odd/even numbers.

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 the language of chance.

Possible: It is possible that Dad/Mam/my sister/my brother 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 and set in the west tomorrow.
Even chance: There is an even chance that I will get heads when I toss a coin.

Probability lines



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Explain to your child that this probability line represents a range from **impossible** to **certain**. In the middle of the line is **even chance** – this is when there is a 50/50 likelihood/chance/probability/possibility, such as when you toss a coin. Other possibilities (which are not labelled) exist on the line e.g. likely, unlikely, very unlikely and very likely.

Activity: Give your child a series of statements and ask him/her to place each statement on the appropriate part of the probability line by simply pointing to the place. For example:

- *Your cousins will visit this evening.*
- *Football training will be cancelled this weekend.*
- *Dad will go grocery shopping tomorrow.*
- *We will have prawns for dinner on Thursday.*
- *All the children will be sent home early from school on Tuesday.*
- *It will rain tomorrow.*
- *There will be snow in Cork in August.*
- *A 747 jet will land at Knock airport.*
- *Wicklow will win the All-Ireland Senior Football title this year.*

Beads in a bag

For this game, you will need some coloured beads/counters/cubes/toy bricks. Encourage your child to use the language of chance as outlined above during this game. Get a bag or box. Ensure that your child cannot see inside it. If you don't have a bag or box, your child can do this experiment while blindfolded. Place 10 coloured beads or cubes into the bag or box: five blue, three red, one yellow and one green. Explain that you want him/her 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 because there are no black beads.)*
- *Which two colours have an even chance of being pulled out? (Yellow and green.)*

Extension 1: Ask your child to determine the probability/chance/likelihood of picking a blue cube at random. Probability can be represented as:

- *A chance: There is a 5 in 10 chance. This is simplified as a 1 in 2 chance or 1 : 2.*
- *A fraction:* $\frac{1}{2}$.
- *A decimal: 0·5.*
- *A percentage: 50%.*

Calculate the likelihood of choosing each colour at random. This activity can be repeated several times using different combinations of coloured cubes, e.g. four red, three blue, two green and one yellow.

Extension 2: Play the game using different combinations and numbers of beads. For example, you could use 20 beads: seven yellow, four green, six blue and three red beads. Discuss whether or not the most likely colour is always chosen at random. By playing, your child should realise that chance always carries a risk!