Look back

Your child will be revising work done in Third Class (pages 1–6) on the numerals/numbers 0–999; addition and subtraction of numbers with totals to 999; fractions (halves, quarters, eighths and tenths); 2-D shapes (square, rectangle, triangle, circle, semi-circle, oval and hexagon); 3-D shapes (cube, cuboid, cylinder, sphere, cone, square pyramid and triangular prism); tens and units to 999; performing simple shopping activities with totals to €19·99; and reading the time in one-hour, half-hour, quarter-hour and five-minute intervals in both analogue and digital forms over the coming days. Your child needs to know the mathematical language associated with the numerals 0–999: 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.

The following are a few ideas that you can use with your child. Some were done in Third Class.

Adding and subtracting to 100

Ask your child to put counters, cubes, coins or anything that you have to hand on any number from 1 to 99 on the hundred square, e.g. 85, 42, 69. Now ask him/her to put counters on the number that is 10 more/10 less, 20 more/20 less than the number.

Extension 1: Ask your child to put counters on a specific number e.g. *Place your counter on the number that has 5 tens and 3 units. Place your counter on the number that has 7 tens and 0 units.*

Extension 2: Do some addition sums using the hundred square as an aid, e.g. *Let's add 34 + 25 on the hundred square.* Give your child a little time to try this using different strategies. For example, s/he may just count on 25 from 34 or s/he may see the 25 as 2 tens and 5 units and may therefore jump 2 tens and then move on 5 units on the hundred square.

3-D shapes

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

2-D shapes

It must be emphasised that 2-D shapes cannot be held. They are only pictures or 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 cube on a piece of A4 paper. Draw or trace around the side and s/he will be left with a square. Ask your child to find something in the shape of a square, circle, semi-circle, oval or hexagon around the house or local environment, e.g. clock face, windowpane, panel in a door, calendar, pencil top, etc.

Game: Coins up to €2 and notes to €10

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

€9·46 = €5 + €2 + €2 + 20c + 20c + 5c + 1c

€13·28 = €10 + €2 + €1 + 20c + 5c + 2c + 1c

€16·19 = €10 + €5 + €1 + 10c + 5c + 2c + 2c

Fractions

Give your child an A4 sheet of paper. Ask him/her to fold the sheet in half. Ask him/her to find half of a number, e.g. *Find half of 16.*

First ask your child to count out 16 cubes. Next ask him/her to share the 16 cubes equally between the two halves of the sheet. Now ask: *How many cubes are on the left part of the sheet? How many cubes are on the right half of the sheet? Did you share the cubes equally? So what is half of 16?*

You can do the same with quarters by folding the sheet twice. Fold the sheet again to make eight equal sections and ask your child to share 24 cubes, 1c coins or counters equally among the eight sections on the A4 sheet. This activity could also be done by sharing 24 counters, cubes or 1c coins on 2, 4 or 8 plates.

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

Game 1: Clap, tap

Count with your child from different starting points between 0 and 9999. For example, begin at 2346: 2347, 2348, 2349 and so on. Now begin at 7854 and count backwards: 7853, 7852, 7851.

Now count with your child in thousands from different starting points between 0 and 9999. For example, start counting in thousands from 0: 1000, 2000…9000. Now start counting in thousands from 1389: 2389, 3389…9389. Now start counting from 581: 1581, 2581…9581.

As your child says each thousand, s/he alternates clapping his/her hands to tapping his/her feet. For example, 0 (clap hands), 1000 (tap feet), 2000 (clap hands), 3000 (tap feet) and so on.

Game 2: Calculator fun

Ask your child to enter 1000 + into his/her calculator. If s/he keeps pressing the equals sign (=), the display on the calculator will count up in thousands.

Variation: Press 9995 – 1000 and continue pressing the equals sign. The calculator will display counting back in thousands from 9995. This can be done for any target number you like.

Game 3: The mystery number

Think of any number between 0 and 9999. Invite your child to ask you questions in order for him/her to find out the number. You can only reply using 'yes' or 'no' answers. Your child must ask at least three questions before s/he can try to guess what the mystery number is. For example, s/he might ask: *Is it less than 3560? Is it an even number? Does it have more than 6 thousands/ 5 hundreds/8 tens/2 units? Is the thousands digit greater than the units digit? Is the hundreds digit greater than the tens digit?* You can continue for different mystery numbers using a similar type of questioning.

Game 4: Playing cards lotto

Give your child and yourself 18 cards each from a regular deck of cards, but only use cards 1–9 (ace = 1). You are not allowed to look at the cards. You take the top four cards from the top of your pile and turn them face up on the table. You must arrange the four cards to make the biggest number possible using all four cards. Call out or write down the number you have made. For example, if you turn over a 5, 2, 3 and a 1 (ace), the biggest number you can make is 5321. Now ask your child to take his/her turn. If s/he turns over a 4, 2, 3 and 6, the biggest number s/he can make is 6432. Whoever has the biggest number wins a point. In this case, your child wins the point because 6432 is bigger than 5321. Play continues until all the cards in your pile have been turned over. The winner is the player with the most points at the end of the game.

Game 5: Dice lotto

Ask your child to roll four regular, six-sided dice and make the biggest number possible. For example, if s/he rolls a 2 on the first die, a 6 on the second die, a 5 on the third die and a 7 on the fourth die, the biggest number s/he can make is 7652. Ask him/her to use digit cards to make that number or write the number on a piece of paper.

Now you take your turn to make the biggest possible number with the four dice. For example, if you roll a 3, 2, 1 and 5, the biggest number you can make is 5321. You can use digit cards to make that number or write it on a sheet of paper.

Whoever has the biggest number wins a cube or counter. In the above scenario, your child wins a cube, as 7652 is bigger than 5321. Play continues as above until the first person wins 5/10/15/20 cubes (decide on the number of throws in advance).

Greek numerals

Your child will be introduced to how the ancient Greeks wrote numerals. You might like to research this on the internet with your child to compare the ancient Greek numerals with the numerals that we use today (the Hindu–Arabic numeral system, based on Arabic numerals).

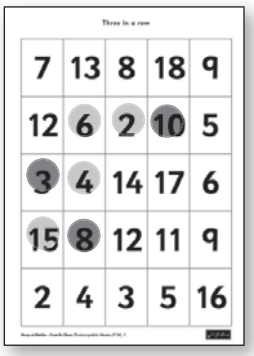
Further research: Invite your child to find out and compare what symbols other ancient cultures used for their numerals, such as ancient Romans, ancient Egyptians, ancient Chinese and so on.

Addition and subtraction 0–9999

Your child will be learning about adding a four-digit number to a four-digit number with and without regrouping (swapping 10 units for a ten, swapping 10 tens for a hundred and/or swapping 10 hundreds for 1000). S/he needs to know the mathematical language associated with addition: and, add, addition, altogether, plus, together, total, increase, row, column, vertically, horizontally, diagonally, value, counting on, thousands, hundreds, tens and units, digit, more, less, swap, regroup, total amount, maximum.

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

Game 1: 3 in a row



Materials required: 3 in a row game board (can be made on a sheet of A4 paper), three different coloured six-sided dice, two different coloured sets of counters (10 of each colour)

Addition: Invite your child to roll the three dice and to add the numbers shown. For example, if s/he throws a 4, 6 and 2, s/he adds to get 12. S/he puts one of his/her red counters on one of the number 12s on the 3 in a row game board. You then take your turn rolling the dice, adding and placing one of your green counters on the corresponding number on the game board. Play continues like this until the first person connects three of their counters in a row vertically, horizontally or diagonally.

Subtraction: Play as above using two dice, but this time subtract the smallest number from the largest number and continue as above.

Game 2: Show the biggest number

Materials required: Deck of cards 1–10 (ace = 1; remove all other picture cards), counters

Addition: Each player gets nine cards each. Keep the 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 your child turns over a 7, 2 and 9, s/he adds them together to get 18. Then you do the same. Compare the totals – whichever player has the biggest total 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: Add four cards together instead of three.

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

Game 3: Calculator challenge

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

Game 4: Count up to a target number

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

Invite your child to throw the three dice and then add the totals shown on them together, e.g. if your child throws a 4, 6 and 5, s/he gets 15. Write down 15 on the sheet of paper in the column under his/her name. Then you take your turn. For example, if you throw a 5, 3 and 4, write down 12 on the sheet of paper in the column under your name. Your child throws again and this time, for example, s/he throws a 5, 2 and 3 = 10. S/he must now add the 10 to the score s/he already had: 15 + 10 to get 25. Play continues until one player gets to a target number of 100 and is declared the winner (the target number can be any agreed number).

Representing data

Your child will be learning to represent and interpret data on block graphs, pictograms, bar charts and bar-line graphs over the coming days. S/he will also be introduced to pie charts for the first time. Your child will need to know the language associated with data: scale, represent information, stock, more/less, shorter/longer, horizontal, vertical.

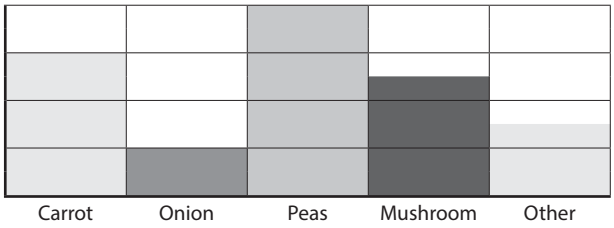
Your child will also be using tallies. Tallies are used to count numbers quickly. They are usually done in groups of five.

What do graphs and charts have in common?

All graphs and charts must have the following:

- *A title, e.g. Favourite Colour.*
- *Categories that have been labelled, e.g. Red, Yellow, Blue, Green, Other.*
- *A 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 block chart of favourite vegetables. Each block represents two items. This is a scale of 1:2 or 1 to 2.

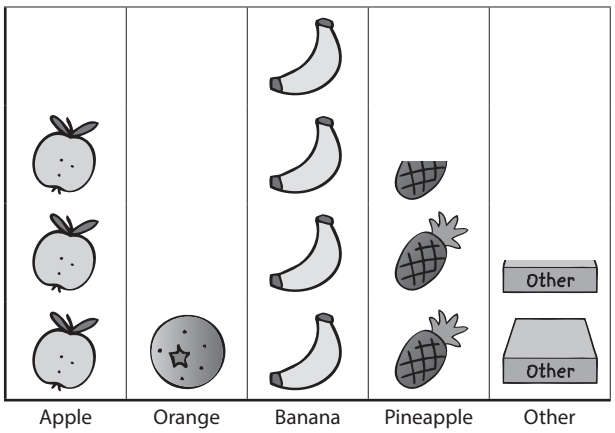


Ask questions to help your child to interpret the data that is represented above:

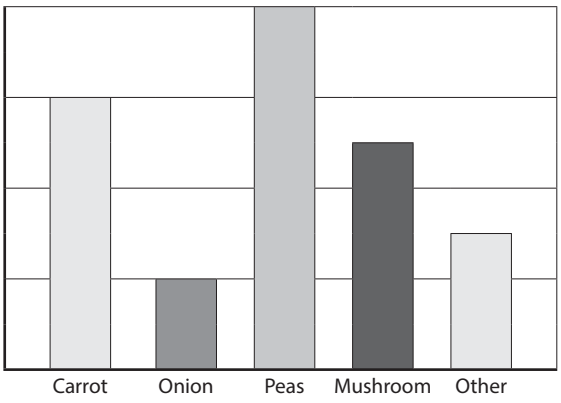
- *What should the title of this block chart be?*
- *What is the scale of this block chart?*
- *How many categories were there to choose from? Can you name them?*
- *Which vegetable is most/least popular?*
- *How many people voted for onion?*
- *Why do you think one of the categories is called 'other'?*
- *How many more people voted for peas than onion?*
- *How many fewer people voted for carrot than peas?*

Extension: Encourage your child to collect data about favourite colours from family members and friends. The information should be represented on a block chart using A4 paper.

Other graphs



Pictogram

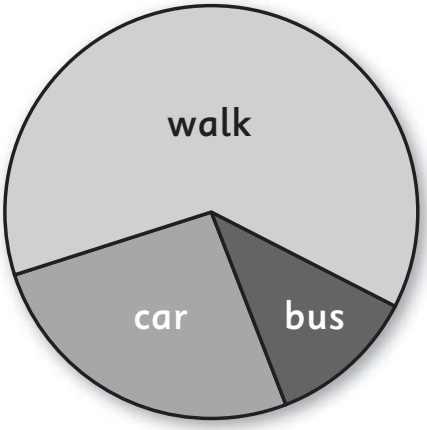


Bar graph

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

Pie charts

Pie charts give us information at a glance. Discuss this chart with your child.



Pie chart

Estimation, addition and subtraction problem-solving

Your child will be learning about the estimation strategy rounding. S/he will learn to round numbers to the nearest 10, 100 and 1000. S/he will solve addition and subtraction problems and will be required to always estimate the answer to the problems first by rounding. Your child needs to know the mathematical language associated with estimation: estimate, round up, round down, nearest thousand/hundred/ten, more than, less than, between.

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

Rounding rhyme

1 through 4, stay on the floor.

5 through 9, climb the vine.

Round down, round up

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

Extension: Count from 110 to 120, 1230 to 1240, etc.

More than or less than

Give your child various addition and subtraction problems within 9999 and invite him/her to estimate by rounding if the answer to the problems is more than a given number or less than it. For example:

- *247 + 381 = ? Is it more or less than 500?*
- *3267 – 1458 = ? Is it more or less than 2000?*

Discuss the strategy your child used.

The number line

Draw a number line up to 30 on a sheet of A4 paper. Show your child various numbers shaded in on the number line from 0 to 30, e.g. 11, 18, 22, 28. Ask your child to determine if the number is nearer to 10 or 20, 20 or 30. Discuss the strategy s/he used.

Show your child various numbers shaded in on the number line from 100 to 200, e.g. 123, 150, 189. Ask him/her to determine if the number is nearer to 100 or 200. Discuss the strategy s/he used.

Now show him/her a blank number line with markings from 0 to 1000. Explain that 0 is at one end and 1000 is at the other end. Invite him/her to show where the number 300, 400, 700, etc. should roughly appear on the number line. Ask him/her to determine if the number is nearer to 0 or 1000. Discuss the strategy used.

Problem-solving strategies

The following strategies help children to solve problems. Use these strategies with your child when solving problems:

- *Construct a model, e.g. with blocks or tangrams.*
- *Draw a picture.*
- *Create a graph.*
- *Look for patterns.*
- *Make a guess and test it.*
- *Write a number sentence.*
- *Solve a simpler version of the problem.*
- *Break the problem down and solve each part.*
- *Make a chart or table of the information.*
- *Use appropriate equipment, e.g. calculators, scales, metre stick.*

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

Game: Calculator fun

Invite your child to press 8 + followed by the = sign on the calculator to show counting in 8s (repeated addition). Alternatively, press 64 – 8 followed by the = sign to show counting back in 8s (repeated subtraction).

Variation: Ask your child to key in numbers on the calculator that are definitely not multiples of 8 and count up or back in 8s, e.g. 9 + 8 = = = = = = or 120 – 8 = = = = =.

This can be done with any of the multiplication or division tables 1 to 10.

Some strategies for teaching number facts

Strategy A: Five facts and the clock

Point to various numbers on the clock, e.g. 12 o'clock. Invite your child to count on in groups of five minutes from 12 o'clock. Now connect this idea with the multiplication facts for 5.

Strategy B: Seven facts and calendar patterns

Encourage your child to examine a calendar month. Ask: *What day does the seventh day fall on? What date will it be exactly one week from that?* Count up and down in 7s using the calendar month as a focus. This will help his/her understanding of the 7 times table.

What's the product?

Call out a random series of products for each separate multiplication table. Your child and one other player must answer by offering the correct factors for that table. For example, for the 3 times table, call out the product 24. Your child offers 8 as the missing factor and then offers the 8 x 3 = 24 number sentence as the solution.

Show the biggest number

Each player gets 10 cards from a regular deck of cards (cards 1–10 only; ace = 1) and keeps their cards in a pile face down on the table. Player A turns over the top two cards and multiplies the numbers together. For example, if Player A turns over a 7 and a 9, s/he multiplies them 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. Your child can write his/her number sentences on a sheet of paper.

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

Multiply a two-digit number by a one-digit number

Present your child with a real-life problem, such as: There are 16 marbles in a box. How many marbles are in three boxes? Ask your child to represent the 16 marbles using one 10c coin and six 1c coins. Invite him/her to put one 10c coin and six 1c coins on each of the three plates. Ask the following questions:

- *How many single 1c coins (units) have I now? Yes, 18! What can I swap the 18 single coins (units) for? Yes, one 10c coin and eight single coins.*
- *How many single coins (units) have I left? Yes, eight single coins (units).*
- *How many tens have I now? 3 tens + 1 ten = 4 tens.*

16 x 3 = ☆

t	u
1	6
x	3
4	8

Your child will be learning about division over the coming days. Your child 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 in the Home/School Link Sheet 6 can also be used for this chapter.

Division can be represented in many ways

Your child needs to be familiar with all the ways that division can be represented as well as all the language associated with division:

$\frac{48}{6} = 8$ $\quad 48 \div 6 = 8$ $\quad 6\overline{)48}$ $\quad 8$ $\quad 6\overline{)48}$

Game 1: Countdown!

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

Game 2: Calculator fun

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

Alternatively, press 108 – 9 followed by the = sign to show counting back in 9s (repeated subtraction).

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

Variation 2: Ask your child to key in higher numbers on the calculator and count up or back in 9s, e.g. 125 – 9 = = or 250 – 9 = = = = =.

Equal sharing 1: Sharing different items

Give your child 15 marbles, cubes, shells, clothes pegs, etc. and three plates. Ask him/her to share the 15 marbles equally among the three plates. S/he should count them out one at a time until all 15 items have been shared equally.

Note: Later, your child should be able to put more than one at a time onto each plate.

Ask questions such as the following:

- *How many marbles are on each plate? Yes, five.*
- *Did each plate get the same amount? Yes.*
- *So, 15 shared among three plates equals five.*
- *Now add the sets together: 5 + 5 + 5 = 15 or 3 x 5 = 15 (this leads to the understanding of division as repeated subtraction).*

Equal sharing 2: Division with remainders

Give your child 23 cubes, counters, etc. and ask him/her to share them into three even groups or sets. S/he should work out physically that there are seven cubes in each set with two cubes left over.

Equal grouping activity: How many groups?

Pose the problem: There are 30 apples in a box. How many bags of six can be filled from the box? Let 30 counters or cubes represent the apples and let paper plates represent the boxes. Invite your child to move the counters to form groups of six.

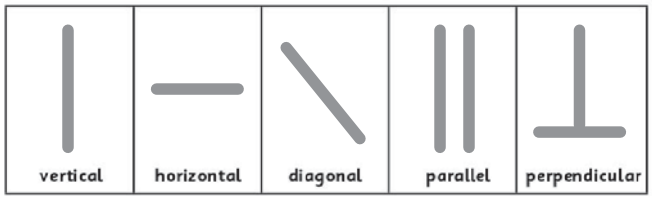
- *There are five bags/groups of six.*
- *So 30 ÷ 6 = 5.*

Lines, rotations and angles

Your child will be learning about lines and angles over the coming days. Your child needs to know some of the language associated with lines and angles, such as: vertical, horizontal, diagonal (or oblique), parallel, perpendicular, positions, greater/less than, angle, acute, obtuse, right angle.

Line Types

Explain the terms vertical, horizontal, diagonal (or oblique), parallel and perpendicular by referring to the lines below:



Notes:

- *Parallel lines run in the exact same direction. If they were extended, they would never meet or get closer/further apart.*
- *Perpendicular lines form right angles.*

Making lines

Encourage your child to identify examples of vertical, horizontal, diagonal, parallel and perpendicular lines around the home/local environment.

Extension 1: Gather some long, straight objects (e.g. pencils, dry spaghetti, penne pasta, straws, crayons). Check and further your child's knowledge of these different types of lines with instructions such as:

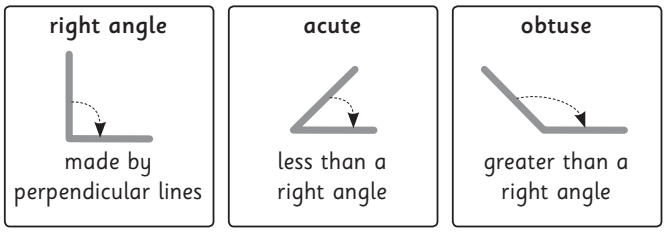
- *Place the pencil in a vertical position.*
- *Place two crayons so they are parallel to each other.*
- *Use straws to show perpendicular lines.*

Extension 2: Encourage your child to use his/her body to demonstrate the different types of lines with instructions such as:

- *Lie in a horizontal position.*
- *Place your arm in a vertical position.*
- *Show two fingers parallel to each other.*
- *Make diagonal lines with your legs.*

Angles

Explain the terms right, acute and obtuse angles by referring to the angles below.

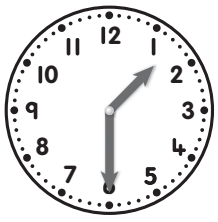


Making a right angle

A very simple guide to measuring a right angle, is by using your hand – simply make an 'L' shape with the thumb and index finger. The angle created is very close to a right angle. Encourage your child to try to make the thumb and index finger perpendicular to each other! Angles that are smaller than the 'L' are acute angles. Angles that are larger than the 'L' are obtuse angles.

Using the 'L' shape, encourage your child to find right angles around the home/garden.

Clock angles



The clock is a great way to explore angles, as the hands can be rotated to form different types of angle. Encourage your child to make the different types of angle using the big and small hands of the clock.

Body angles

Encourage your child to show the different types of angle, using his/her body. Yoga poses for children are a fun way to advance this exercise!

The role of the calculator

Your child will be learning how to use the calculator over the coming days. S/he needs to know the mathematical language associated with the calculator: calculator, key, clear key, clear entry, calculation, estimate, calculate, screen display.

'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 encourage your child to estimate the answer to a problem before they perform it on a calculator.

Repeated addition

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

Repeated subtraction

Invite your child to key 72 into the calculator, followed by the – key, then followed by the 8 key. Keep pressing the = key to count back in 8s with the calculator. This is a good way to explain/learn all the division tables. It shows division as repeated subtraction.

Addition

Most children will know how to perform the basic operations on a calculator. Demonstrate how to add two numbers, e.g. 24 + 37, by pressing the 2, 4, +, 3, 7, = keys in that order.

Now invite your child to add together three/four/five numbers on the calculator.

Subtraction

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

Multiplication

Ask your child to perform various multiplication problems by using the multiplication (x) key, e.g. solve 24 x 52 by pressing the 2, 4, x, 5, 2, = keys in that order.

Repeated multiplication: Ask your child to key 4 x 3 = = = = = into his/her calculator to see how the display changes.

Division

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

Calculator letters and words

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

For example:

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

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 465. The target number is 89.

1. Take away 400: 465 – 400 = 65.
2. Add 24: 65 + 24 = 89.

We reached the target number in just two separate operations. Try some more examples.

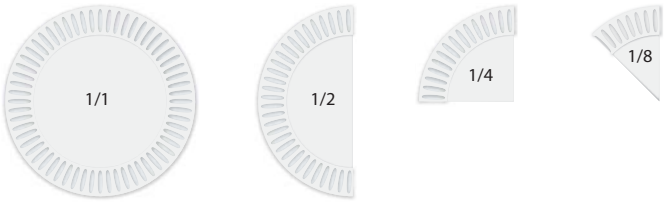
Your child will be learning about fractions – half ($^1/_2$), quarters ($^1/_4$), eighths ($^1/_8$), tenths ($^1/_{10}$), thirds ($^1/_3$), sixths ($^1/_6$), ninths ($^1/_9$), twelfths ($^1/_{12}$) and fifths ($^1/_5$) – over the coming days. S/he needs to know some of the mathematical language associated with fractions: fraction, biggest, halves, quarters, eighths, tenths, smaller, set, comparing, division, thirds, sixths, ninths, twelfths, equivalent, multiple, whole amount.

Folding paper plates

Give your child the first paper plate (if you don't have paper plates, simply trace around a circular object and cut it out). Explain that the paper plate is the whole amount. There is one piece and it can be represented in fraction form as $^1/_1$.

Now give your child a second paper plate. Encourage your child to fold it in half (along a line of symmetry). Explain that the plate has been folded into two equal parts. Each part is a half ($^1/_2$). The denominator (the number on the bottom) means that there are two pieces. The numerator (the number on the top) means that this is one of those pieces.

Using a third and fourth paper plate, encourage your child to fold the plates into quarters ($^1/_4$) and eighths ($^1/_8$).



Extension: Encourage your child to compare the fractions on the different paper plates through questions such as:

- *Which is larger: $^1/_2$ or $^1/_8$?*
- *How many quarters are in $^1/_2$?*
- *How many eighths are in one whole plate?*
- *Which is smaller: $^3/_8$ or $^2/_4$?*

Comparing more fractions

The fractions $^1/_3$, $^1/_6$, $^1/_9$ and $^1/_{12}$ will be explored and compared in school, as well as $^1/_2$, $^1/_5$ and $^1/_{10}$. These fractions are much more difficult to fold from paper plates or rectangular pieces of paper than the fractions that were explored in the previous activity. To overcome this, fraction walls or charts are very popular. You could ask your child's teacher for a photocopy of the strips that make up a fraction wall or you could download them from the internet. Once you have a fraction wall, the different fractions can be compared using questions similar to those in the extension in the previous activity.

1/1								
1/3			1/3			1/3		
1/6		1/6		1/6		1/6		1/6		1/6		1/6	
1/9		1/9		1/9		1/9		1/9		1/9		1/9		1/9		1/9		1/9		1/9

Finding a fraction of the whole

You will need concrete items for sharing, e.g. cubes, counters or marbles. Explain to your child that you have 20 cubes in your hand and you want to put one-quarter of them on each of the four sections of a rectangle or circle that you have folded into quarters. Share the cubes equally among the four sections until they are all gone. Ask your child questions such as:

- *How many cubes are in each section?*
- *Have the cubes been shared equally?*
- *So what is $^1/_4$ of 20? Yes, it's five!*

Extension: To deepen your child's understanding of finding a fraction of a set of objects, change the fractions and the number of cubes in the problems. For example:

Share 72 cubes into eight equal sections.

- *What is $^1/_8$ of 72? Yes, nine.*
- *What is $^3/_8$ of 72? Yes, 27.*

Share 27 cubes into nine equal sections.

- *What is $^1/_9$ of 27? Yes, three.*
- *What is $^8/_9$ of 27? Yes, 24.*

Ask your child to make up some questions.

Your child will be learning about decimals involving tenths and hundredths over the coming days. S/he will need to know the mathematical language associated with decimals: tenths, hundredths, decimals, decimal number, decimal fraction, bigger, smaller, unit, ten, hundred, thousand, equal part, odd one out, whole numbers, decimal point, value of digits, place holder, metre, centimetre, hundreds house, tens house, units house, tenths house, hundredths house, kilogramme, gramme, litre, millilitre.

The decimal point

Discuss the function of the decimal point with your child. To separate the units from the fractions, we use a dot called 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. The decimal point is always placed between the unit house and the tenth house.

Explain to your child that 0·43 in words is zero point four three or forty-three hundredths or four tenths and three hundredths. Similarly, 3·92 is three point nine two or $3\ ^{92}/_{100}$ or $3 + {}^{9}/_{10} + {}^{2}/_{100}$.

It is important to make the connections between fractions and decimals at all times.

Decimal counting

Count in decimals with your child from different starting points between 0 and 10. Examples: Start counting in decimal from 0, 0.1, 0.2…; 3.7, 3.8, 3.9, 4.0, 4.1…; 0.01, 0.02, 0.03…; 0.15, 0.16, 0.17…; 0.32, 0.33, 0.34…etc.

Variation: Count backwards from different starting decimal numbers also.

Calculator fun

Ask your child to enter 0·1 + into his/her calculator. If s/he keeps pressing the equals sign, the display on the calculator will count up in tenths: 0·1, 0·2…0·9. Stop your child at 0·9 and ask him/her what s/he thinks the next decimal number displayed on the calculator will be. Let him/her explain his/her reasoning. Now ask your child to offer explanations as to why the calculator displays 1·0 after 0·9 instead of 0·10.

Extension: Proceed as above, but this time ask your child to enter 0·01 + into the calculator. Now ask him/her to predict what the screen will display after 0·99.

Variation: Start at different numbers, for example 3·01, 4·1, 5·37, 6·89, 7·54.

Decimals in the environment

Invite your child to look for decimal numbers (involving one and two decimal places) in the environment and either photograph them or draw a picture of them. Make a booklet of decimals in the environment.

Examples: shopping receipts; weights and capacities on various household items; price tags on clothes; prices on goods in the supermarket, restaurant, hotel, etc.

Making tenths from materials in the environment

Give your child a 1 metre length of string. Invite him/her to cut the metre string into 10 equal parts. Allow him/her to discover the length of $^{1}/_{10}$ or 0·1 as 10cm. Similarly, invite your child to cut a 10cm strip into 10 equal parts. Allow him/her to discover the length of $^{1}/_{100}$ or 1cm.

Extension: A kilogramme (1000g) bag of sugar could be divided into 10 equal parts (100g) and 100 equal parts (10g) using a kitchen scale. A 1 litre (1000ml) bottle of water could be divided into 10 equal parts (100 ml) and 100 equal parts (10ml) using smaller 100ml bottles and spoons (a teaspoon holds 5ml).

The mystery number

This game was also used for place value in Home/School Links Sheet 2. Think of a decimal number between 0·01 and 9·99. Invite your child to ask questions in order to find out what the number is. You can only reply using 'yes' or 'no' answers. Encourage your child to ask at least three questions before s/he can guess what the mystery number is. For example:

- *Is it less than 4·2?*
- *Does it have more than eight tenths?*
- *Does it have less than seven hundredths?*
- *Is the tenths digit less than the hundredths digit?*
- *Is the tenths digit more than the hundredths digit?*

2-D Shapes

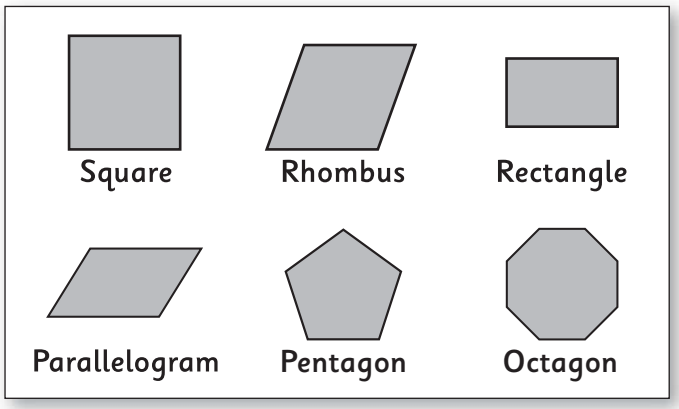
Your child will be learning about 2-D shapes (shapes with only two dimensions – length and width/breadth) over the coming days. Some of this work will be revision, but new shapes – the rhombus, parallelogram, pentagon and octagon – will be introduced. Triangles will also be looked at in closer detail. Your child needs to know the mathematical language associated with 2-D shapes: angles (acute, obtuse and right), sides, parallel, straight/curved sides, opposite, regular, irregular, symmetrical, tessellate.

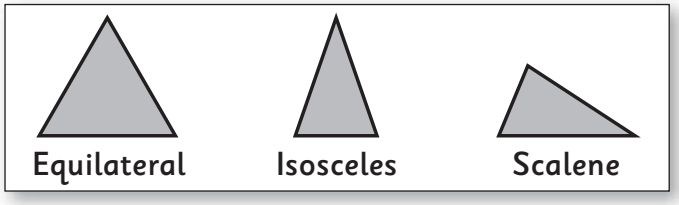
Notes for parents

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

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

Looking at 2-D shapes





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

- *How many sides does a rectangle have?*
- *How many angles does a square have? Name them.*
- *Which shape looks like a rectangle that has been pushed out of shape?*
- *How many sets of parallel sides does a regular octagon have?*
- *Is a rectangle symmetrical? (Can it be folded into two identical halves?)*
- *Which of the above shapes are irregular? Why?*
- *Which triangle has no equal sides?*
- *Describe an equilateral triangle, etc.*

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

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

Tessellating shapes

Tessellating shapes fit together without overlapping or leaving gaps. Give your child six sheets of A4 paper (or envelopes or playing cards). The A4 paper has a rectangular outline. Ask your child to see if s/he can make a tessellating pattern with rectangles.

Extension: Find out if circles/semi-circles tessellate by tracing around the rim of a mug and creating a pattern.

Shape hunt

With your child, find examples of the different 2-D shapes and tessellating shapes around your home or local environment e.g. floor or wall tiles, outline of a window, patterns on fabric, outline of furniture, window panes.

Extension: Use the internet to search for examples of 2-D shapes in real life.

Coins

Your child will be dealing with all coins up to and including the €2 coin as well as the €5, €10 and €20 notes over the coming days. This will be done through games and activities using play money or real coins. Your child needs to know the mathematical language associated with money: euro, cent, round, match, cost, bought, item, change, amounts, enough, spending, saving, estimate, price, total, addition, subtraction, opposite, altogether.

Target money numbers

Give your child a selection of money (real, play or cardboard): 1c, 2c, 5c, 10c, 20c, 50c, €1 and €2 coins as well as a €5, €10 and €20 note. Pick a target amount and write it on a Post-it note or piece of paper, e.g. €4·68. Ask your child to make this target amount using the least number of coins possible. Encourage your child to make the target amount by starting with the biggest possible coins. Examples:

€2·47 = €2 + 20c + 20c + 5c + 2c

€3·37 = €2 + €1 + 20c + 10c + 5c + 2c

€5·74 = €5 + 50c + 20c + 2c +2c

€9·61 = €5 + €2 + €2 + 50c + 10c + 1c

€11·83 = €10 + €1 + 50c + 20c +10c + 2c + 1c

€13·28 = €10 + €2 + €1 + 20c + 5c + 2c + 1c

Giving change from €5/€10/€20

Ask your child to make some price tags for items with prices up to €19·99. Put the price tags on a range of items in your home, e.g. beans, cereal, kettle, vase, bowl, schoolbag, jumper, jeans, apple, orange, pear, pineapple. Give your child a selection of coins as well as a €5, €10 and €20 note. Explain to your child that s/he will play the role of shopkeeper and that you will play the role of shopper. You will buy only one of the items with the price tags. The shopper should hand in a price tag, e.g. for the cereal, which could cost €2·92, as well as a €5 note. The shopkeeper has to give change to the shopper. Encourage your child to count on when giving change, e.g. €2·92 + 3c → €2·95 + 5c → €3·00 + €2·00 → €5. Change = 3c +5c + €2 = €2·08. After a number of transactions have taken place, you can change roles.

Extension: Encourage your child to buy more than one item (but the total price must not exceed €20). S/he must add up the prices (mentally or using a pencil and paper) before calculating the change.

Shopping trips

Bring your child along to help with the grocery shopping. As you walk through the aisles, ask your child to look for the prices of the items you want to buy. Encourage your child to round the price of each item to the nearest euro. Using these rounded prices, ask your child to keep track of the approximate total cost of the items in the trolley. When you get to the till, compare the estimated total with the actual total shopping bill.

Fantasy shopping

Give your child a shopping catalogue, e.g. from a toy, grocery, hardware or clothes shop. Set your child a shopping challenge, e.g. Buy any three items that you want from the catalogue, but your maximum budget is €50! Your child must calculate the total bill before calculating the change.

Extension: There is lots of scope for extension work with this activity. Simply change the number of items your child can buy and/or alter the maximum/minimum budget.

Get saving!

This activity can be done at any time during the year. When your child expresses a particular interest in getting a new item, e.g. football boots, a book, a skateboard, a new jumper, a magazine, encourage him/her to save up the money, e.g. saving pocket money or earning money by doing chores. Discuss the activity and ask questions such as:

- *How much does the item cost?*
- *How long do you think it will take to save up for it?*
- *How much money do you have now?*
- *How much more money do you need?*

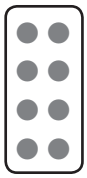
Value for money!

When going shopping, give your child a list of items from your shopping list which s/he is responsible for buying. Explain to your child that s/he only has a fixed amount of money, e.g. €10 to buy all the items. Your child's challenge is to locate the items. S/he must then compare the prices of different brands of the same item and choose the items which offer the best value for money. Reward your child for bringing back change.

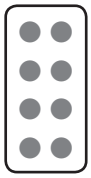
Your child will be learning about long multiplication over the coming days. S/he needs to know the mathematical language associated with multiplication: multiply, multiplication symbol (x), skip count, pattern, relationships, double, near double, two for the price of one, buy one get one free (commutative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

Note: All the activities outlined in the Home/School Links Sheet 6 are also relevant here. You may wish to revise some of those activities with your child.

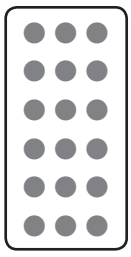
Game 1: Arrays

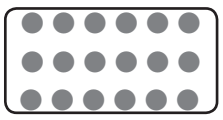


An array is an arrangement of objects in rows and columns, such as dots, cubes, pegs or blocks. Invite your child to draw two rows of four on squared paper. Invite him/her to suggest how we write this using symbols: 2 x 4 = 8.



There are opportunities to develop the commutative property here. Invite your child to draw four rows of two on the squared paper: 4 x 2 = 8.





Now invite your child to draw other rectangular arrays on squared paper, e.g. 5 x 7, 7 x 5; 4 x 3, 3 x 4; 6 x 3, 3 x 6; 8 x 3, 3 x 8.

If your child understands this property, s/he will only need to recall half of the multiplication tables!

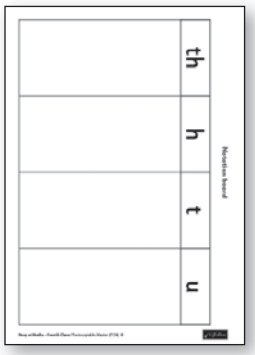
Game 2: Two for the price of one

Note: The commutative law can be described as buying two multiplication tables for the price of one or buy one table and get one free, e.g. 8 x 3 = 24 or 8 x 3 = 24; 6 x 5 = 30 or 5 x 6 = 30.

Give your child 24 counters, cubes, coins or shells. Ask him/her to come up with as many ways of arranging the 24 counters into different sets as possible: 3 x 8, 8 x 3; 6 x 4, 4 x 6; 2 x 12, 12 x 2; 1 x 24 or 24 x 1.

Variation: Ask your child to do a similar activity for 20, 36, 48, 72, etc. counters.

Multiplying by a power of 10



The idea of teaching your child the rule that when multiplying by 10 we just add a zero is to be avoided. Instead, you should lead your child to discover that the digit moves from the units to the tens position and the zero is placed in the units house. It is essential that your child is led to discover this movement through the use of concrete materials.

Draw a notation board on an A4 sheet of paper, as shown.

Invite your child to display the number 2, for example, using base ten material. Invite your child to move the number one place to the left and ask: What number do we have now? Yes, 20! Activities such as this will help your child understand that it is the digits that move into the next column when multiplying by 10. Do this with other numbers.

Long multiplication

Your child may use different types of strategies when inventing his/her own strategies.

1. Repeated Addition:

48 x 6

48 + 48 + 48 + 48 + 48 + 48

Some children will progress to doubling the first two (48 + 48 = 96) and then adding 96 + 96 + 96.

2. Break up the numbers

52 x 16 = ?

(52 x 6) + (52 x 10) =

(50 x 6) + (2 x 6) + (52 x 10) = 300 + 12 + 520 → 832

Division 2 – By 3, 6 and 9

Your child will be learning about division over the coming days. Your child 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.

Note: All the activities related to multiplication outlined in the Home/School Links Sheets 6 and 14 are also relevant here, as are the activities related to division on Home/School Links Sheet 7. You may wish to revise some of those activities with your child. Much of the information on this sheet was also given on Home/School Links Sheet 7.

Division can be represented in many ways

Your child needs to be familiar with all the ways that division can be represented as well as all the language associated with division:

$\frac{36}{4} = 9$ $\quad 36 \div 4 = 9$ $\quad 4\overline{)36}$ $\quad 9$ $\quad 9\overline{)36}$ $\quad 4$

Game: Calculator fun

Invite your child to press 7 + followed by the = sign on the calculator to show counting in 7s (repeated addition).

Alternatively, press 84 – 7 followed by the = sign to show counting back in 7s (repeated subtraction).

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

Variation 2: Ask your child to key in higher numbers on the calculator and count up or back in 7s, e.g. 9 + 7 or 118 – 9 = =.

The distributive property of division

Give your child 42 cubes and ask him/her to share them into three even groups or sets. Use the plastic cups or plates to hold each set of cubes. Your child should work out physically that there are 14 cubes in each set.

Invite your child to write a multiplication equation to represent what s/he has made, e.g. 3 x 14 = 42. Now invite him/her to write a division equation to represent what s/he has made, e.g. 42 ÷ 3 = 14, This emphasises the connection between the multiplication and division operations.

Now invite your child to 'break up' the 42 counters into two smaller sets and in turn divide each smaller set by three. Lead your child through questioning to see that the division of bigger numbers can be made easier by breaking the dividend (the original number) into two smaller numbers that can be divided more easily, e.g. 42 ÷ 3 = (30 ÷ 3) + (12 ÷ 3).

Other examples:

64 ÷ 4 = (40 ÷ 4) + (24 ÷ 4)

75 ÷ 5 = (50 ÷ 3) + (25 ÷ 5)

84 ÷ 6 = (60 ÷ 6) + (24 ÷ 6)

105 ÷ 7 = (70 ÷ 7) + (35 ÷ 7)

Multiplication and division problems

It is essential that you give your child a mix of multiplication and division questions to solve to encourage him/her to think about the correct operation to use in each question. Otherwise it just becomes a series of drill and practice.

Division is the opposite of multiplication

Materials required: Paper plates, counters/cubes/match sticks

Invite your child to place 28 counters on a paper plate. Ask: *How many groups of 7 can you make with the 28 counters? (4)* Then invite your child to make 4 groups of 7. Ask: *How many groups of 4 can you make with the 28 counters? (7)*

Once this is done, ask your child to complete the following number sentences:

4 x 7 = _____

7 x 4 = _____

4 x _____ = 28

7 x _____ = 28

Your child will be learning about decimals involving tenths and hundredths over the coming days. This process was started earlier on Home/School Links Sheet 11. S/he will need to know the mathematical language associated with decimals: tenths, hundredths, decimals, decimal number, decimal fraction, bigger, smaller, unit, ten, hundred, thousand, equal part, odd one out, whole numbers, decimal point, point, value of digits, place holder, metre, centimetre, hundreds house, tens house, units house, tenths house, hundredths house, kilogramme, gramme, litre, millilitre.

Definitions

A decimal number is a number that has a decimal part. For example, 9 is a whole number but 9·3 is a decimal number.

A decimal fraction is the decimal part of a decimal number. For example, 9·3 is a decimal number, but $^{3}/_{10}$ or 0·3 is the decimal fraction because it is less than 1.

The decimal point

Discuss the function of the decimal point with your child. We use a decimal point to separate the units from the fractions. Anything to the left of the decimal point is made up of whole numbers. Anything to the right of the decimal point is made up of fractions or pieces of numbers. The decimal point is always placed between the units and the tenths house.

Explain to your child that 0·43 in words is zero point four three or forty-three hundredths or four tenths and three hundredths. Similarly, 3·92 is three point nine two or 3 $^{92}/_{100}$ or 3 + $^{9}/_{10}$ + $^{2}/_{100}$.

Note: It is important to make the connections between fractions and decimals at all times, in so far as it is possible.

Game: Dice lotto

Invite your child to roll the dice and make the biggest decimal number (to two decimal places) possible. For example, if your child rolls a 3 on the first die, a 6 on the second die and a 7 on the third die, the biggest decimal number s/he can make is 7·63. Invite your child to write that number on a piece of paper.

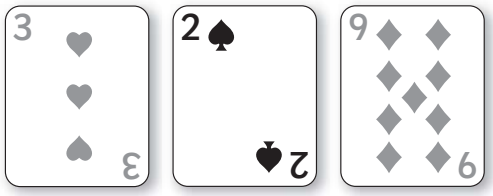
Now you take your turn to make the biggest decimal number possible with the three dice. For example, if you roll a 4, a 3 and a 5, the biggest number you can make is 5·43. Write your decimal number on a piece of paper.

Compare both numbers. Whoever has the bigger decimal number wins a point. In the above scenario your child wins a point, as 7·63 is bigger than 5·43.

Play continues as above until the first person wins five points and is declared the winner.

Playing cards lotto

Each player gets nine cards from a regular deck of cards, but only use cards 1–9 (ace = 1). Place the piles of cards in front of each player. Players are not allowed to look at the cards.



Each player takes the top three cards from the pile and turns them face up on the table. They must arrange the three cards to make the biggest decimal number possible to two decimal places. They take turns to call out the number they have made. For example, if your child turns over a 3, a 2 and a 9, the biggest number s/he can make is 9·32. (Your child may find it helpful to place the red counter (representing the decimal point) between the units card and the tenths card.) Whoever has the biggest decimal number wins a point. Play continues until all the cards in each player's pile have been turned over and compared to the other players. Whoever has the most points at the end of the game is the winner.

Extension: Each player gets 12 cards to begin with. Instead of turning over three cards at a time, the players can turn over four cards to make decimal numbers between 11·01 and 99·99.

Hundred square activity

Make a hundred square (see page 85 of textbook). Colour the tenths and hundredths to suit your own child. You can then ask questions such as the following:

- *How many squares are yellow? What fraction is yellow? What decimal fraction is this?*
- *How many squares are blue? What fraction is blue? What decimal fraction is this?*
- *How many squares are green? What is another name for 5/10? What is 1/2 as a decimal fraction? Yes, 0·5.*

Symmetry

Your child will be learning about symmetry over the coming days. S/he has already been introduced to symmetry in earlier classes. There are many definitions of symmetry. The simplest explanation is probably that symmetry occurs where a line divides a shape into two identical parts – one becomes the mirror image of the other. Your child needs to be aware of some of the mathematical language associated with symmetry: symmetry, fold, line of symmetry, identical, pattern, vertical, horizontal, diagonal.

Mirror, mirror!

Ask your child to stand facing you or any other member of the family. You will play the role of mirror and copy all of the movements (slowly done!) made by your child. After a few turns at this, swap roles and let your child play the role of mirror. This activity is a gentle introduction to symmetry. Your child is creating symmetry by copying your movements.

Conducting the orchestra

Ask your child to stand facing you, as though s/he is a conductor in an orchestra. Play any piece of music (classical works very well!). Encourage your child to move his/her hands to the beat and tempo of the music, opening and closing, lifting and dropping both hands in a symmetrical way.

Symmetrical doodles

Give your child a piece of paper and two pencils (or crayons or markers). S/he must hold both pencils at the centre of the page. Moving both pencils in opposite directions, encourage your child to create symmetrical doodles. While the dominant hand will make stronger markings on the page, a symmetrical pattern should emerge without much difficulty.

Symmetrical painting

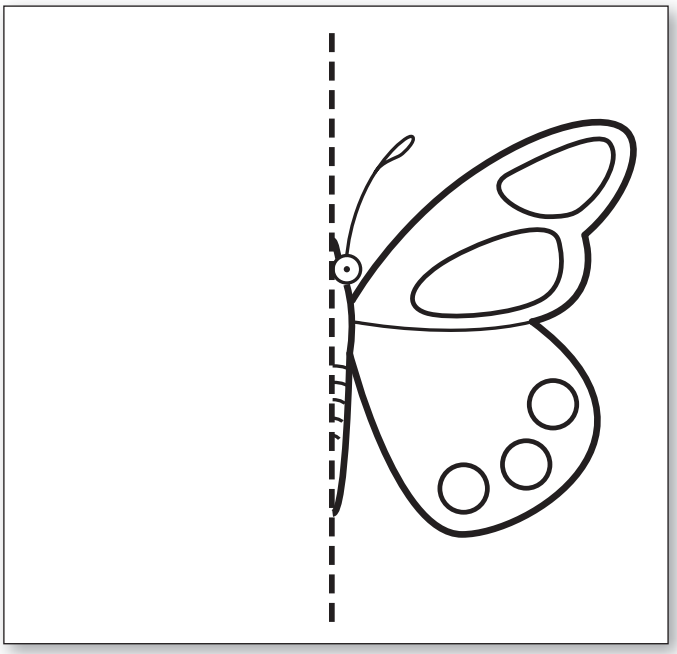
Give your child an A4 sheet of paper. Ask him/her to fold the sheet down the centre from top to bottom. Now ask him/her to paint a design, pattern or picture on one half of the page. Encourage him/her to use plenty of paint – so it does not dry too quickly. Once the painting is finished, encourage your child to fold the paper along the fold line s/he previously created. The painted side should sit against the unpainted side of the paper. Encourage your child to rub the painted side against the unpainted side, thus transferring the paint from one side to the other. When the paper is unfolded, a symmetrical picture or pattern should appear.

Lines of symmetry

Ask your child to cut out some shapes or pictures of people, flowers, trees, etc. from newspapers or magazines. Ask him/her if the shape or picture has a line of symmetry (fold line). If it does, ask your child to draw the line of symmetry on the shape or picture. Some shapes may have only one line of symmetry. Others, such as a square, can have a number of lines of symmetry. Discuss these lines of symmetry with your child.

Symmetrical pictures

Give your child a piece of paper. The paper should be folded in half, either vertically or horizontally. Tell your child to use the fold line as the line of symmetry. Ask him/her to draw half of a picture, pattern or design on one side of the line. Explain that you will then complete the symmetrical picture. Alternatively, you could draw the first half and ask your child to complete the symmetrical picture.



Symmetry hunt

With your child, find examples of different symmetrical patterns, pictures and designs around your home or local environment e.g. windows, paintings, floor tiles, lamps, radiators, utensils.

Extension: Use the internet to search for examples of symmetry in real life.

Time

Your child will be learning to read the time in five-minute and one-minute intervals on the analogue and digital clock over the coming days. Your child will need to know the language of time: clock, hours, minutes, long/short hand, before, after, earlier, past, intervals, digital/analogue form, departs, arrives, departure.

Reading the time on an analogue clock

Source an analogue clock that you and your child can manipulate (move and change the hands). Show different times on the clock and ask your child to read these times, e.g. 10 past 6, 7 o'clock, $^1/_4$ to 9, 25 past 2, 13 minutes to 11. Similarly, you can call out a specific time and ask your child to show that time on the clock.

Extension 1: Each number around the clock represents both an hour and an interval of five minutes. For example, 2 = 2 o'clock and it also marks the '10 minutes past' point. Encourage your child to revise his/her 5 times tables. This will help him/her to count the minutes around the clock quickly. Over time, your child should know each number and its equivalent number of minutes from memory (6 = 30, 10 = 50 and so on).

Extension 2: Focus your child's attention on the position of the short (hour) hand as the long hand moves around the clock. The short hand will point exactly at a number only at an 'o'clock' time, e.g. at 4 o'clock the short hand will point exactly at 4. At $^1/_2$ past 4, the short hand will point halfway between 4 and 5. These changes in position are subtle but very important.

Reading the time on a digital clock

Source a digital clock that your child can manipulate, e.g. a mobile phone clock, watch or an alarm clock. The digital clock is used very often in our daily lives and children often find it easier to read than the analogue clock. Ask your child to read the time, remembering that the hour comes first and the minutes come after.

Note: Children are only required to read the 12-hour digital times in Third and Fourth Classes, i.e. 8:15 rather than 08:15 (am and pm are not formally taught until Fifth Class). However, most children will recognise 08:15 from their own watches or mobile phones. It would be wholly proper to accept this correct usage of the time from your child.

Extension 1: Call out specific times and ask your child to show these digital times on his/her digital clock.

Extension 2: Show a specific time on your analogue clock, e.g. 22 minutes past 7, and ask your child to show the equivalent time on the digital clock, e.g. 7:22.

Extension 3: Look through timetables in magazines, newspapers or online (e.g. television timetables, bus and rail timetables, cinema guides) and ask your child to read these times.

Personal timetable

At the weekend, help your child make a timetable of a typical family Saturday. The times should be written in digital time.

Extension 1: Ask questions about the timetable, e.g. How long did the family spend eating? How long did Sarah spend at football practice?

Extension 2: You could ask your child to plan out his/her fantasy timetable for a Saturday. S/he will have a great time planning a fun-filled family day!

Stopwatch experiments

Use the stopwatch to do a selection of fun activities. For example:

- *How many times can you jump from a standing position in one minute?*
- *How many pages of a book can you read in five minutes?*
- *How long does it take you to brush your teeth?*
- *How long does it take Dad to wash the dishes?*

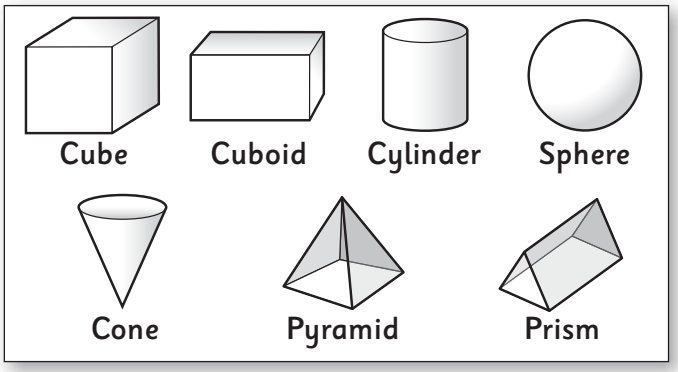
Encourage your child to predict the outcomes before carrying out each experiment.

Your child will be learning about 3-D shapes over the coming days. This will be done through games and activities using concrete materials. Your child will need to know the mathematical language associated with 3-D shapes: face, edge, vertex, vertices, 3-D, 2-D, net, base, diagonal, triangular, square, pentagonal, hexagonal, slice, equal.

Notes for parents

- *A vertex is a point or tip on a 3-D shape. The plural of vertex is vertices.*
- *There is considerable international debate about edges and faces of 3-D shapes. Some educationalists believe that faces and edges can only be flat (which would mean that a sphere has no face). 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.*
- *3-D shapes are solid. They can be held because they have depth. A 2-D shape does not have depth.*
- *2-D shapes are only pictures or drawings. They are flat. They cannot be held.*
- *When we trace around a 3-D shape, we can draw a 2-D shape. For example, a square can be drawn on paper from a cube.*

Looking at 3-D shapes



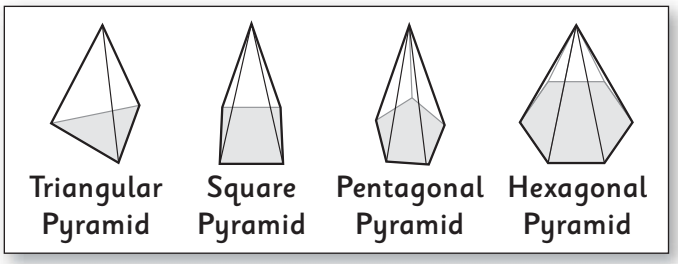
Discuss these 3-D shapes with your child by asking questions such as:

- *How many faces does a cuboid have? Name them.*
- *How many vertices does a cube have?*
- *Name the 3-D shapes that have curved faces.*
- *How many edges does a triangular prism have?*
- *Which of the 3-D shapes can roll?*
- *Name something in our home that is shaped like a cylinder.*

Pyramids and prisms

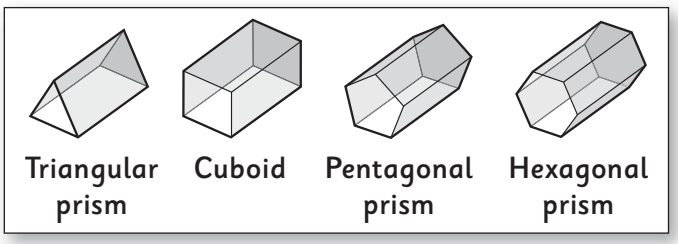
Pyramids

Explain to your child that a pyramid is named after the shape of its base (the face it usually sits on). All other faces are always triangular.



Prisms

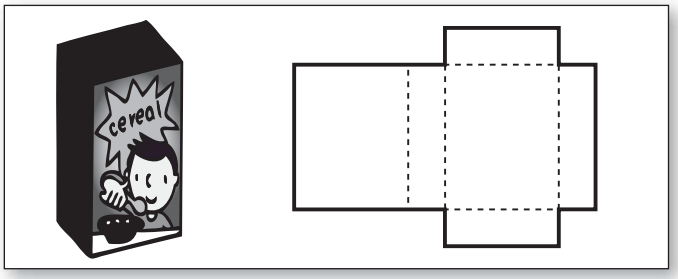
Explain to your child that a prism is named after the 2-D shape on either end. All other faces are usually rectangular (but can be square). A prism can be cut into identical slices. All sides of a prism must be flat.



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

Extension 2: Use the internet to search for examples of prisms and pyramids (and all the other 3-D shapes) in real life.

Shapes nets



When we unfold a 3-D shape, we see its shape net. This can be folded up to form the solid shape again. With your child, unfold a cereal box to discover its shape net.

Extension: Download shape nets from the internet that belong to any of the above 3-D shapes and help your child form 3-D solids.

Tenths

Your child will be learning about equivalent fractions (fractions that have the same value as each other, e.g. $^1/_2 = {}^2/_4$) over the coming days. S/he will also be learning how to express a number as a fraction of another number and s/he will be solving real-life problems based on fractions. Your child needs to know some of the mathematical language associated with fractions: fractions, equivalence, equal, the same value, fraction wall/chart, signs (<, = and >), bigger/smaller amount, above/below the line, number line/strip.

The fraction wall – revision

Revise the work done earlier in the year using the following sets: halves, quarters, eighths and tenths; thirds, sixths, ninths and twelfths; and halves, fifths and tenths. You may have kept your fraction wall from your previous work on fractions. If not, you could print a fraction wall from the internet or you could ask your child to make a copy of the fraction wall from page 101 of *Busy at Maths 4* using an A4 sheet of paper.

1/8							
		1/4					

Ask your child to cut out each fraction strip. Ask him/her to manipulate the fractions to show equivalence (fractions that are equal) by placing them on top of each other, e.g. place two quarters over one half to show that they are equivalent/equal/the same. Place six eighths over three quarters in the same way.

Extension 1: Call out two different fractions. Encourage your child to call out a fraction that is bigger than that. For example, if you call out $^1/_2$, your child can say $^5/_8$, $^3/_4$, $^6/_8$, $^7/_8$. Help your child to check the answer by comparing the specific fraction strips.

Extension 2: Encourage your child to add different fractions e.g. $^1/_3 + {}^1/_6$. To do this, s/he must convert $^1/_3$ into $^2/_6$. Then the fractions are easy to add.

Finding the whole amount

Activity 1

For this activity, you will need an A4 sheet of paper divided into eight equal pieces and at least 32 cubes, marbles, pasta shells or whatever you may have to hand.

Pose a problem to your child, such as: One-eighth of my cubes is 3. Ask your child to place three cubes on one of the eight sections of the piece of paper. Ask him/her to come up with a strategy to find out how many cubes you have altogether. You may like to try this strategy:

- *How many equal pieces has the paper been divided into?*
- *How many of the eighths contain cubes? Yes, just one!*
- *How many cubes are there on $^1/_8$? Yes, three!*
- *If we know that $^1/_8 = 3$, how can we find $^8/_8$? Yes, we just multiply the answer by 8.*
  So 3 x 8 = 24. The total is 24!

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

Activity 2

Using the same page and cubes, place four cubes on any three of the sections/eighths of the paper. Ask your child to come up with a strategy to find out how many cubes you have altogether. You may like to try this strategy:

- *How many of the eighths contain cubes? Yes, three!*
- *How many cubes are in $^3/_8$? Yes, $^3/_8 = 12$.*
- *If we know that $^3/_8 = 12$, how can we find $^1/_8$? Yes, we simply divide the total by 3. So 12 ÷ 3 = 4. That means that $^1/_8 = 4$.*
- *If we know that $^1/_8 = 4$, how can we find $^8/_8$? Yes, we just multiply the answer by 8. So 4 x 8 = 32. The total is 32!*

Encourage your child to place three cubes on each section/eighth to verify the answer. You can do this activity with different numbers.

Coins and notes

Your child will be dealing with the multiplication and division of money over the coming days. S/he will also be dealing with real-life problems involving money. Your child needs to know the mathematical language associated with money: money, cost, euro, cent, multiplication, division, digits, charge, change, shared, estimate, prices, cost, buy, buying, metre, reduction, sale price, item, rental rates, renting, restaurant bills, receipts, labelled packs.

Giving change from €5/€10/€20

Ask your child to make some price tags for items with prices up to €19·99 using Post-it notes. Put the price tags on a range of items in the home, e.g. beans, cereal, kettle, vase, bowl, schoolbag, jumper, jeans.

Give your child a selection of coins as well as €5, €10 and €20 notes. If you don't have real money, feel free to use Monopoly or play money. Explain to your child that s/he will play the role of shopkeeper and that you will play the role of shopper. You will have a €5 note and will buy only one of the items that have price tags on them. You should hand in a price tag, e.g. for the cereal, which could cost €2·92, and offer the €5 note in payment. The shopkeeper has to give change to you. Encourage your child to count on when giving change, e.g. €2·92 + 3c → €2·95 + 5c → €3·00 + €2·00 → €5. Change = 3c +5c + €2 = €2·08. After a number of transactions have taken place, you can swap roles, with your child now playing the role of shopper.

Extension: Encourage your child to buy more than one item (but the total price must not exceed €20). S/he must add up the prices (mentally or using a pencil and paper) before calculating the change to be given from €5, €10 or €20 notes.

Shopping trips

Bring your child along to help with the grocery shopping. As you walk through the aisles, ask your child to look for the prices of the items you want to buy. Encourage your child to round the price of each item to the nearest euro. Using these rounded prices, ask your child to keep track of the approximate total cost of the items in the trolley. When you get to the till, compare the estimated total with the actual total shopping bill.

Shopping – multipacks

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

- *How much does a pack of 12 toilet rolls cost? Calculate the cost of one toilet roll.*
- *How much does a single tin of tomatoes cost?*
- *How much does a multipack of three tins cost? Calculate the cost of one tin from the multipack.*
- *Which is better value: three single tins of tomatoes or the multipack of three tins?*

Receipts

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

- *What shop is this receipt from?*
- *What date was this receipt issued?*
- *What was the total of the shopping bill?*
- *How much change did I get?*
- *Did I buy more than one of any item?*
- *How many items did I buy?*
- *Did I save any money by buying items on special offer?*
- *If six bananas cost €1·29, what was the cost of one banana?*
- *Look at the price of a box of cereal. How much would four boxes of cereal cost?*

Catalogue shopping

Give your child a shopping catalogue (e.g. from a toy, grocery, hardware or clothes shop). Give your child problems to solve, such as:

- *If a football costs €13·20, how much would nine footballs cost?*
- *If I bought a jumper and a pair of jeans, how much change would I get from €50?*
- *Name six items that I could buy with €20.*
- *If I bought four bowls, what change would I get from €15?*

Centimetres and metres

Your child will be learning about centimetres and metres over the coming days. Your child needs to know some of the mathematical language associated with the metric system: length, centimetres (cm), metres (m), measure, longer, shorter, total, decimals, fractions, metre stick, more/less than, long, longer, equal, distance, high, tenth, hundredth, decimal point.

Get measuring – centimetres and metres

Source a ruler and a metre measure. You can make a metre stick, a metre strip or metre string using a metre on a tape measure. Or you may prefer to just use the tape measure! Ask your child to examine both the ruler and the metre by asking such questions as:

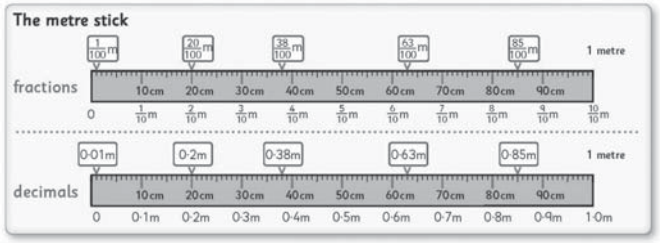
- *How many centimetres are on the ruler?*
- *How many centimetres are in a metre?*
- *How many centimetres are in $^1/_2$ / $^1/_4$ / $^3/_4$ of a metre?*

Your child needs to know the best measuring length or tool to use when measuring different items. Ask him/her questions such as: Would you use a ruler or a metre measure to measure the height (or length or width) of a mug/radiator/door/plant/shoe/car/door/window/garden/football pitch?

Extension 1: Gather a selection of household items and ask your child to measure the length/height or width of each one.

Extension 2: Invite your child to arrange the household items in order from shortest to longest.

The metre – a closer look

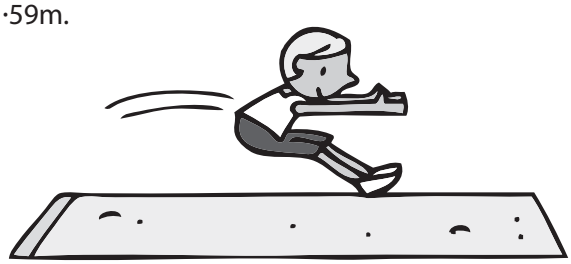


Help your child to practise reading the metre sticks in both fraction and decimal form. Ask him/her questions such as:

- *How many centimetres are in 0·5m?*
- *What is 37 centimetres in fraction form and decimal form?*
- *What is another name for $^7/_{10}$ metre?*
- *How many centimetres are in 0·82m?*

Long jump

Set up a long jump area in the your hall or garden. Make sure that your child will not be in any danger from traffic, stones or sharp objects. Mark a start position. Invite the members of your family (or friends) to jump in the long jump. Using a metre measure (or extended measuring tape), encourage your child to measure the length of each jump. Encourage him/her to record the lengths in centimetres and metres in both decimal and fraction form, e.g. 1m 59cm or 1 $^{59}/_{100}$m or 1·59m.



Chalk drawings

Give your child a bar of chalk, a ruler and a metre measure. Set your child different lengths that s/he must measure out on the patio area of your garden or on a path (ensuring that your child is not in any danger from traffic). Alternatively, you can use long strips of paper and pencils or crayons. Ask your child to:

- *Draw a line that is 9cm long.*
- *Draw a line that is 1·04m long.*
- *Draw a line that is $^8/_{10}$ of a metre long.*
- *Draw a line that is 2m 26cm long.*
- *Draw a line that is $^{73}/_{100}$ of a metre long.*

Family height chart

Help your child measure the height of each family member. Encourage your child to predict how tall each person is before using a tape measure to find their exact height.

Extension: Using the tape measure, your child could also measure the length of each family member's leg, arm, distance around the waist/shoulders/wrist/ankle, etc.

Your child will be learning about adding and subtracting whole numbers and decimals up to two places of decimals as well as multiplying and dividing decimal numbers up to two places of decimals over the coming days. S/he will need to know the mathematical language associated with decimals: tenths, hundredths, decimals, decimal number, decimal fraction, estimate, swap, unit, ten, hundred, thousand, whole numbers, decimal point, point, value of digits, place holder, centimetre, metre, kilometre, hundreds house, tens house, units house, tenths house, hundredths house, addition, plus, minus, subtraction, take, divide, multiply, regroup, exchange.

Note 1: All the activities in Home/School Links Sheet 11 and Home/School Links Sheet 16 can be revised here to further consolidate the concept of decimals along with the following activities.

Note 2: It is crucial that children always estimate before adding or subtracting decimals.

The shopkeeper game

One player acts as the shopkeeper. To begin, the shopkeeper has all the base ten materials.

Player A rolls a die (preferably a nine-sided die, but a regular six-sided die will work too) and collects that number of hundredths (1c coins) from the shopkeeper. Player B takes his/her turn and collects the number of hundredths that is shown on his/her die from the shopkeeper. Play continues like this until a player has more than nine hundredths (1c coins). For example, if Player A had eight hundredths (1c coins) and rolled the die and got a 4, s/he would now have 12 hundredths (1c coins) altogether.

Player A must then go to the shopkeeper and swap the 12 hundredths for one tenth (one 10c coin) and two hundredths (two 1c coins). Play continues until the first player to make €1 (1 unit) is the winner.

Extension: Each player has €1 (unit) to begin with. Player A rolls the die and gives back the number of hundredths shown to the shopkeeper. For example, if Player A throws a 4, s/he will need to go to the shopkeeper and break up a unit into 100 hundredths. S/he is then in a position to give back four hundredths (1c coins). Player B takes his/her turn and gives back the number of hundredths shown on the die. Play continues until one player has given back all their hundredths.

Definitions

A decimal number is a number that has a decimal part. For example, 9 is a whole number but 9·3 is a decimal number.

A decimal fraction is the decimal part of a decimal number. For example, 9·3 is a decimal number, but $^{3}/_{10}$ or 0·3 is the decimal fraction because it is less than 1.

The decimal point

Discuss the function of the decimal point with your child. We use a decimal point to separate the units from the fractions. Anything to the left of the decimal point is made up of whole numbers. Anything to the right of the decimal point is made up of fractions or pieces of numbers. The decimal point is always placed between the units and the tenths house.

Explain to your child that 0·43 in words is zero point four three or forty-three hundredths or four tenths and three hundredths. Similarly, 3·92 is three point nine two or 3 $^{92}/_{100}$ or 3 + $^{9}/_{10}$+ $^{2}/_{100}$.

Note: It is important to make the connections between fractions and decimals at all times, in so far as it is possible.

Where does the decimal point go?

Give your child a series of problems involving addition, subtraction, multiplication and division of decimals along with the answers with the decimal points missing. Encourage your child to estimate the answer by adding, subtracting, multiplying and dividing the whole numbers and then invite him/her to determine where the decimal point should be inserted in the answer.

For example:

12·78 + 5·2 = 17·98 (13 + 5 = 18)

23·8 – 6·91 = 16·89 (24 – 7 = 17)

2·14 x 6 = 12·84 (2 x 6 = 12)

9·27 ÷ 3 = 3·09 (9 ÷ 3 = 3)

Pattern and sequences

Your child will be learning about pattern and sequences over the coming days. S/he needs to know the mathematical language associated with pattern and sequences: copy, extend, devise, predict, repeated pattern, element of the pattern.

Note 1: Stages of development in exploring patterns:
1. Children copy patterns.
2. Children extend patterns.
3. Children devise their own patterns.

Note 2: Your child should be able to predict what comes next in a given pattern and should give a reason for his/her prediction.

Game: What is missing?

Devise a pattern with your child using any material you have to hand at home, such as pasta shapes, coloured clothes pegs, socks, etc. Invite your child to close his/her eyes. Remove one item from the pattern and tell your child to open his/her eyes. Your child must decide what is missing and explain his/her reasoning. For example, make a pattern out of socks: red, red, blue, green, purple, purple, red, red, blue, green…

Pattern detective

Ask your child to examine patterns from his/her environment around the home or garden, such as wallpaper, gift-wrapping paper, bathroom/kitchen tiles, striped jumpers, etc. Discuss them and draw attention to the way each pattern is repeated.

Integrate patterns

Have fun copying, extending and devising the following patterns. Always invite the children to say what comes next and to explain their reasoning for their answer.

- *P.E.: Long step, short step, long step; clap hands, touch knees, touch toes.*
- *Visual Arts: Matchbox dipped in paint: vertical, horizontal, vertical, etc. Design a necklace with three to four different coloured beads.*
- *Nature: Life cycle of animals.*
- *Science: Use rough and smooth materials to make rough, smooth, rough, smooth, etc. patterns.*
- *Music: Create a pattern with two or three percussion instruments, e.g. hit a triangle, drum, tambourine, triangle, drum, tambourine. Children take turns repeating the same sounds. Make singing patterns, e.g. doh ray me fa, doh ray me fa.*

Extension: Invite your child to close his/her eyes. As with earlier patterns, remove one item from these patterns. Ask your child to open his/her eyes, decide what is missing and explain his/her reasoning.

Time patterns

Days of the week: Discuss the days of the week pattern with your child. Ask him/her what day comes after Tuesday, Friday, etc. Ask similar questions about the patterns for the months of the year and the seasons.

Your child's day: Examine the pattern for a typical day for your child and discuss it, e.g. before breakfast, after breakfast, at school, when I go home, after dinner, etc.

Money patterns

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

Extension: Ask your child to predict what the 10th/15th, etc. coin will be in the pattern.

Skip counting in 2s, 3s, 4s…10s

Ask your child to find things in the local environment, home or garden that come in 2s, 3s, 4s…10s. S/he could also research this on the internet under your guidance.

Calculator fun

Ask your child to press 6 + = = = on the calculator to show counting in 6s. This can be done for all tables.

Ask your child to key in 108, then press – 9 = = = on the calculator to show counting back in 9s. This can be done for all division tables.

Hundred square detective work

Using the hundred square on page 123 of the textbook, ask your child questions such as:

- *How many rows are on the hundred square?*
- *How many numbers begin with 7? Where are they?*
- *What is the first number in the second row? What is the last number in the eighth row?*

Over the coming days, your child will be learning to convert hours to hours and minutes and vice versa. S/he will be learning to add and subtract amounts of time. S/he will also look more closely at bus, train and TV timetables and real-life problems based around time. Your child will need to know the mathematical language associated with time: hours, minutes, digital/analogue form, addition, subtraction, regroup minutes to hours, television, guide, timetable.

Reading the time on an analogue clock – revision

Source an analogue clock that you and your child can manipulate (move and change the hands). Show different times on the clock and ask your child to read these times, e.g. 10 past 6, 7 o'clock, $^1/_4$ to 9, 25 past 2, 13 minutes to 11. Similarly, you can call out a specific time and ask your child to show that time on the clock.

Reading the time on a digital clock – revision

Source a digital clock that your child can manipulate, e.g. a mobile phone clock, watch or an alarm clock. The digital clock is used very often in our daily lives and children often find it easier to read than the analogue clock. Ask your child to read the time, remembering that the hour comes first and the minutes come after.

Extension 1: Call out specific times and ask your child to show these digital times on his/her digital clock.

Extension 2: Show a specific time on your analogue clock, e.g. 22 minutes past 7, and ask your child to show the equivalent time on the digital clock, e.g. 7:22.

Extension 3: Look through timetables in magazines, newspapers or online (e.g. television timetables, bus and rail timetables, cinema guides) and ask your child to read these times.

Hours and minutes

Encourage your child to convert minutes into hours and minutes, e.g. 94 minutes = 1 hour 34 minutes. Similarly, ask your child to convert hours and minutes into minutes, e.g. 2 hours 1 minute = 121 minutes.

Extension: Encourage your child to revise his/her 6 times table. Once this is mastered, s/he will find it easy to count in 60s, as they are obviously linked, e.g. 6, 12, 18, 24, 60, 120, 180, 240. This will help your child to quickly convert minutes to hours and minutes and vice versa.

Timetables

Ask your child to look through timetables in magazines, newspapers or online, e.g. TV timetables, bus and rail timetables, cinema guides. Ask questions to make sure your child understands how to read a timetable, such as:

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

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

Real-life word problems

Set simple but meaningful little problems for your child to solve on a regular basis. For example:

- *If we leave for swimming at 4:20 and the journey takes us 17 minutes, what time will we arrive?*
- *If I walk into the supermarket at 11:04 and leave at 11:48, how long did I spend inside?*
- *If we go horse riding at 3:45 and the lesson lasts 1 hour and 28 minutes, what time will it end?*
- *Football training starts at 10:45. It lasts for 70 minutes. What time will football training end?*

Fantasy timetable

Invite your child to make up a fantasy timetable for a 'Family Fun Day'. Your child must choose at least five activities (e.g. bowling, swimming, baking, archery, etc.) for the family to complete and decide the start and end times of each activity. The times must be written in digital form. When the timetable is completed, ask your child questions based on the timetable, e.g. 'How long does 'bowling' last for?', etc.

Chance

Your child will be dealing with chance (probability) over the coming days. S/he has already been introduced to chance in Third Class. Probability or chance is a measure of the likelihood of a particular event actually taking place. Your child will need to know the mathematical language associated with chance: impossible, unlikely, likely, even chance, certainly, never, possible, always, definitely.

Game 1: Memory – go fish in the pond

This game is best played with two players. Pick out five pairs from a deck of cards, e.g. two 5s, two aces, two 9s, two 10s and two queens. Shuffle the 10 cards and place them face down in neat rows on a table (5 x 2 or 2 x 5). Explain to your child that the aim of the game is to make a match (matching pair) by turning over any two cards at a time. If a match is made, the player gets to keep the cards. If a match is not made, the cards are turned back over for the next player's turn. Throughout the game, ask your child questions about the chance of him/her making a match, e.g. Is it certain that you will make a match? Is it possible/impossible that you will make a match? Is getting a match on your first go likely or unlikely? Encourage your child to use the language of chance throughout the game.

Game 2: Higher or lower

To play this game, each pair needs a deck of cards and a pencil and paper to keep track of the score. One person is the dealer and the other is the player. The dealer holds all the cards and turns them over one at a time. The player must predict whether the next card will be higher/lower than the previous card. If s/he guesses correctly, a tick is recorded beside his/her name on the piece of paper. If the player predicts incorrectly, the dealer gets a point. The player with the most points at the end of the game wins. Encourage your child to use the language of chance while playing the game. e.g. It's likely to be higher. I'm certain that it will be lower. There is an even chance that it will be higher/lower.

Game 3: Mystery card

This game is similar to the Higher or Lower game above. The card in the middle (face down) is the mystery card. The player must predict whether the mystery card will lie somewhere between the values of the two overturned cards or lie outside this range of values. If the prediction is correct, s/he gets a point. If the prediction is incorrect, the dealer wins the point.

Game 4: Beads in a bag

For this game, you will need some beads, counters, cubes, toy bricks, etc. and a bag or box that your child cannot see inside. Encourage your child to use the language of chance as outlined on the left during this game. Place five coloured beads into the bag, e.g. three blue, one red and one yellow. Explain that you are going to pick one bead out of the bag 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 green bead? Why? (No, it is impossible because there are no green beads in the bag.)*

Extension: Play the game using different combinations of beads, e.g. 4 red, 3 green and 2 blue; 3 red, 4 green and 5 blue, etc.

Snakes and Ladders

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

Kilometres and perimeter

Your child will be learning about kilometres and metres as well as perimeter over the coming days. S/he needs to know some the mathematical language associated with the metric system: length, centimetres (cm), metres (m), kilometre (km), measure, longer, shorter, total, decimals, fractions, metre stick, more/less than, long, longer, equal, distance, high, tenth, hundredth, decimal point, all around, perimeter, sides.

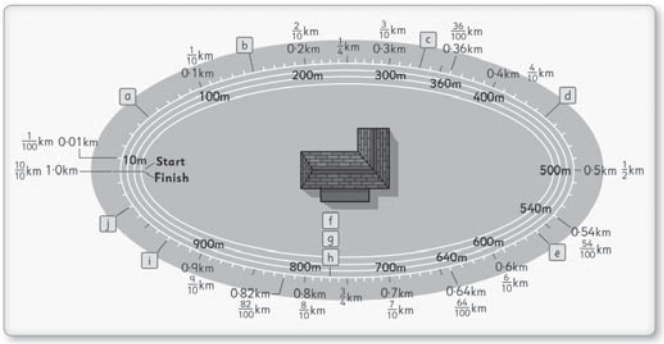
How far is a kilometre?

Explain to your child that a kilometre is 1000 metres long. Kilometres are used to measure longer distances than we have previously looked at. Discuss distances that are measured in kilometres, e.g. from Longford to Cork; from Dublin to London; from your house to a local attraction, e.g. a castle, park or lake.

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

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

The kilometre – a closer look

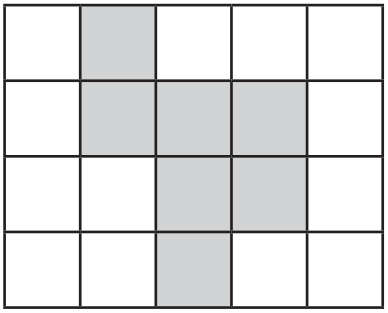


Help your child to practise reading the kilometre in metres in both fraction and decimal form by asking questions such as:

- *How many metres are in $^1/_4$ / $^1/_2$ / $^3/_4$km?*
- *How many metres are in $^7/_{10}$ km?*
- *How many metres are in 0·19km?*
- *What is 540m in fraction and decimal form?*
- *How many metres are in 2km?*
- *What is 1 $^{86}/_{100}$km in decimal form?*

Perimeter

Explain to your child that the perimeter of an object is the total distance around all the sides.

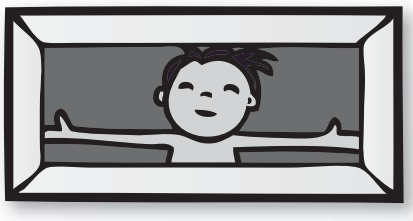


If the length of each square in the above picture is 1cm, the total perimeter of the shaded shape is 14cm.

Using squared paper from a sums copy (the squares may not be 1cm exactly, but for the sake of the exercise, pretend that they are), draw patterns similar to the one above and invite your child to calculate the perimeter of each.

Extension: Ask your child to create shape pictures on squared paper that have a perimeter of 9cm, 11cm, 12cm, etc.

Calculating perimeters



Invite your child to find a simple rectangular photograph or picture frame. Using a ruler, ask him/her to measure the length of each side and then add them in order to find the perimeter.

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

Extension 2: Encourage your child to calculate the perimeter of a selection of household objects. As a challenge, invite him/her to calculate larger perimeters, such as the perimeter of a bedroom or garden.

Multiplication 3

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

Note for parents: All the activities outlined in the Home/School Links Sheets 6 and 14 are also relevant for this chapter. You may wish to revise some of those activities with your child.

What's the product?

Call out a random series of products for each separate multiplication table. Your child and one other player must answer by offering the correct factors for that table. For example, using the 3 times table, call out the product 24. Your child offers 8 as the missing factor and then offers the 8 x 3 = 24 number sentence as the solution.

Multiplying a two-digit number by a one-digit number

Present your child with a real-life problem, such as: There are 16 marbles in a box. How many marbles are in three boxes? Ask your child to represent the 16 marbles using one 10c coin and six 1c coins. Invite him/her to put one 10c coin and six 1c coins on each of the three plates.

- *How many single 1c coins (units) do I have now? Yes, 18! What can I swap the 18 single coins (units) for? Yes, one 10c coin and eight 1c coins.*
- *How many single coins (units) do I have left? Yes, eight single coins (units).*
- *How many tens do I have now? 3 tens + 1 ten = 4 tens.*

16 x 3 = ☆

t	u
1	6
x	3
4	8

Long multiplication

Your child may use different types of strategies when inventing his/her own strategies.

1. Repeated addition

235 x 3

235
235
+235
705

2. Break up the numbers

235 x 3 = ?

(5 x 3) + (30 x 3) + (200 x 3)

= 15 + 90 + 600

→ 705

3. Compensation method

In this method, you make one number bigger and subtract to compensate. For example:

235 x 3 = (250 x 3) – (15 x 3)

→ 750 – 45 = 705

You could also make one number smaller and add to compensate. For example:

235 x 3 = (200 x 3) + (35 x 3)

→ 600 + 105 = 705

Introduce the traditional method

Always begin with a real-life multiplication problem. Demonstrate the multiplication method using the approach outlined on page 141 of the *Busy at Maths 4* textbook.

Your child will be learning about division over the coming days. Your child 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

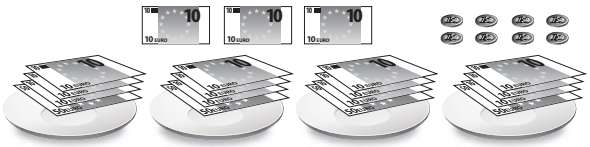
Note: All the activities relating to multiplication outlined in the Home/School Links Sheets 6, 14 and 28 are also relevant for this chapter, as are the activities relating to division in Sheets 7 and 15. You may wish to revise some of those activities with your child.

Division strategy 1

Work through the following problem with your child:
We want to share €358 among four plates.
€358 ÷ 4 = ?

There are not enough €100 notes to put one on each plate, so we must exchange the €100 notes for six €50 notes. That leaves us with 7 x €50 and 8 x €1. Share the €50 notes among the four plates.

That leaves us with 3 x €50 and 8 x €1. Exchange the 3 x €50 notes for 15 x €10. Share the €10 notes among the four plates.



That leaves us with 3 x €10 and 8 x €1. Exchange the 3 x €10 notes for 30 x €1 + €8 = €38.

Share the €1 coins among the four plates.

That leaves us with 2 x €1. Exchange the 2 x €1 coins for 4 x 50c. Share the 50c coins among the four plates.

Strategy 2: Short division involving renaming

Work through the following problem with your child:
A tiler had 679 tiles to tile five identical bathrooms.
How many tiles were needed for each bathroom?
How many tiles were left over?

	h	t	u
5)	6	7	9
	☆		

- *If we share the 600 tiles between the five bathrooms, each bathroom will get one hundred with one hundred left over.*
- *Swap the one hundred for 10 tens. I now have 10 tens.*

	h	t	u
5)	5	17	9
	☆		

- *I had seven tens to begin with. Now I have 17 tens altogether. Can I share 17 tens among the five bathrooms? Yes, 5 x 3 = 15.*
- *How many tens will each bathroom get? Yes, three.*
- *How many tens will I have left over? I will have two tens left over: 17 – 15 = 2.*
- *Swap the two tens for 20 units. I had nine units to begin with. Now I have 29 units altogether.*

	h	t	u	
5)	5	15	29	
	1	3	5	R 4

- *Can I share 29 units among the five bathrooms? Yes. How many units will each bathroom get? Yes, five: 5 x 5 = 25.*
- *How many tiles will I have left over? Yes, four: 29 – 25 = 4.*

679 ÷ 5 = 135 R 4

Kilogrammes and grammes

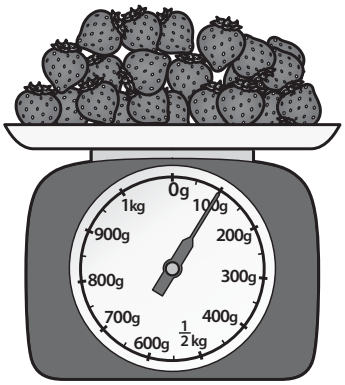
Your child will be dealing with weight – kilogrammes (kg) and grammes (g) – over the coming days. Your child needs to know some of the mathematical language associated with weight: kilogrammes, grammes, scales, heaviest, lightest, heavier, lighter, fraction, decimals, unit, tenth, hundredth.

The kilogramme

Find some 1kg packages in the kitchen, e.g. sugar, rice, fruit, potatoes, flour, butter, pasta. Show them to your child. Discuss the sizes of the different packages and explain that while each of them weighs 1kg, the size may differ greatly depending on the material. For example, 1kg of cotton wool would take up a lot more space than 1kg of pebbles.

Extension: Find a range of items from around the home, garden or local area that are lighter and heavier than 1kg.

Kitchen scales



Source a traditional kitchen scales, if possible. Help your child to explore and understand the markings on the scales.

Ask questions such as:

- *What is the heaviest weight that is marked on this scales?*
- *How many grammes are in 1kg?*
- *How many grammes are in ½kg?*
- *How many grammes must I add to ¾kg in order to make 1kg?*

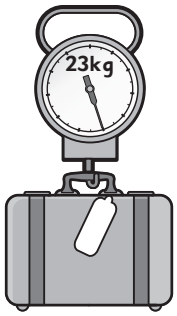
Extension 1: Using the kitchen scales, encourage your child to weigh a selection of household objects, e.g. an orange, eight strawberries, a book, a cup, a pot, four bananas, three apples, a stapler, a box of cereal. Encourage your child to estimate the weight of each object before placing it on the scales.

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

Baking

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

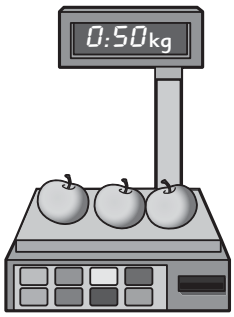
Packing a suitcase



Many households have a spring scales for weighting suitcases. Encourage your child to use the spring scales to weigh a variety of objects, e.g. a coat, schoolbag, small or large suitcase, dress, bucket, handbag.

Extension: Challenge your child to pack a suitcase with toys or clothes where there is a maximum weight of 5kg, 7kg, 10kg allowed by an airline. It will take trial and error to complete this task, but s/he will get lots of good practice using a spring balance.

Shopping trip



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

Extension 1: Ask your child to determine the difference in grammes between the estimated weight of the items and the actual weight.

Extension 2: Weight will be labelled on most supermarket products. Ask your child to find items in the shop that have a specific weight, e.g. 1kg, 550g, less than 200g.

Surface area

Over the next few days, your child will be learning about surface area. S/he needs to know the mathematical language associated with surface area: estimate, compare, area, surface area, regular/irregular shapes, cm^2, m^2.

Measuring a table

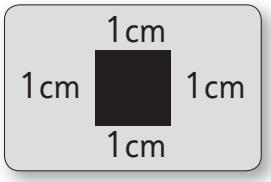
Give your child a selection of objects that have the same surface area, e.g. envelopes, playing cards, A4 pages, copies, placemats. Ask your child to estimate and then measure how many of each item (e.g. placemats) will be needed to cover the surface area of the kitchen table. (If your table is circular, change the focus of the exercise to something rectangular in shape e.g. a bed, TV, floor mat.)

Notes:

- *You may not have the exact amount of placemats needed. If this is the case, the placemats can be used more than once.*
- *Encourage your child to round up if part of a placemat is required in the measurement.*

Extension: Measure the surface area of the table (or bed) with a smaller object (e.g. playing cards) and then with a larger object (e.g. sheets of A4 paper). Discuss the differences between the two results.

The square centimetre



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

Encourage your child to measure out 10 square centimetres. Using these cm^2, encourage your child to measure the surface area of small items around the home, e.g. a photo frame, CD cover, novel, chopping board, envelope, mobile phone, stamp, shoebox, cereal box, coffee table, TV screen.

Notes:

- *The 10 square centimetres can be reused several times to complete many tasks.*
- *If half or more than half of a cm^2 is used, it should be counted in the total. If less than half is needed, it should not be counted.*

Drawing on square centimetre paper

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

Activity 1

Trace a selection of objects onto square centimetre paper, e.g. mobile phone, bowl, spoon, banana, box of playing cards. Include items with straight sides and objects with curved sides. Calculate the area of each object by adding up all the squares covered by the object. As in the previous exercise, when calculating the area of each object, only count squares that are half or more than half covered by the object.

Activity 2

Invite your child to trace his/her hand or foot onto the square centimetre paper. Ask him/her to predict the area before calculating the area of the hand or foot.

Activity 3

Invite your child to draw a selection of 2-D shapes (square, triangle, rectangle, pentagon, hexagon, parallelogram) onto square centimetre paper. Encourage him/her to calculate the area of each shape.

Extension: In Chapter 27 your child learned how to calculate the perimeter of 2-D shapes. Encourage him/her to calculate the perimeter of the shapes s/he has drawn.

Activity 4

Invite your child to draw simple pictures on the square centimetre paper, e.g. a house, car, garden scene or robot. Encourage him/her to calculate the area and perimeter of the drawings and/or individual sections of the drawings.

Activity 5

Invite your child to draw a selection of 2-D shapes onto square centimetre paper. However, this time, dictate the area of each shape, for example, rectangle of area $14cm^2$, square of area $25cm^2$, rectangle of area $11cm^2$. This will challenge your child to think about the meaning of area.

Measuring capacity

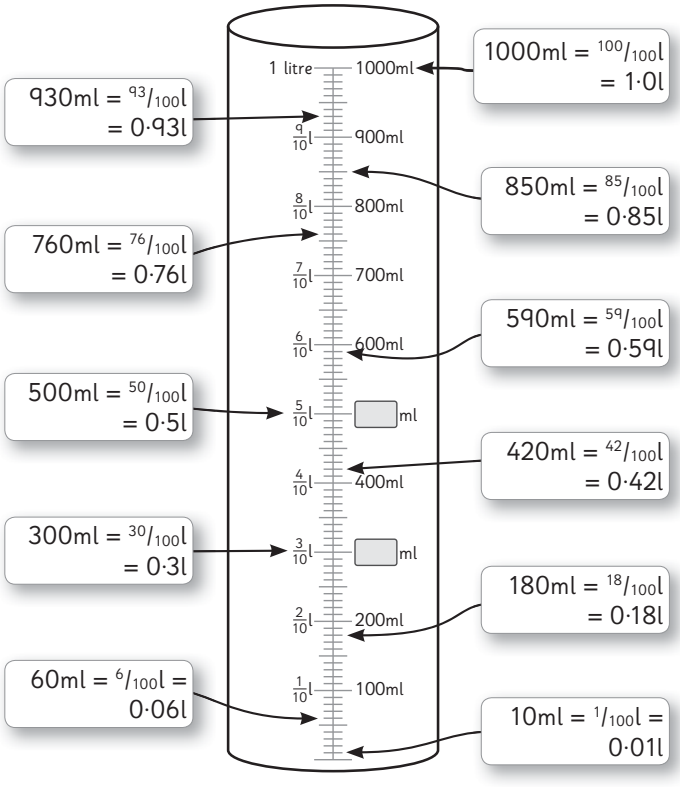
Your child will be learning about capacity (the measure of the amount of liquid that a container can hold) over the coming days. Your child needs to know the mathematical language associated with capacity: litres (l), millilitres (ml), containers, jug, fill, estimate, more/less than, fractions, decimals, decimal point, difference, amount, shared equally, small, medium, large vessels/containers.

The litre

Find as many 1 litre containers as you can from around the home, e.g. milk carton, juice carton, bottle of water, ice-cream tub, lunchbox, Thermos flask, moisturiser bottle, mouthwash bottle, washing-up liquid, fabric softener, shower gel, cooking oil, sauce bottle, cooking oil. Discuss the shape of the different bottles and containers. While the shapes may vary greatly, the capacity (the amount of liquid held) is always the same – 1 litre!

Extension: Encourage your child to test the capacity of the above containers by filling one of them with a material such as water, sand, pasta shells, etc. S/he must then pour the material from this container into another empty 1-litre container. The material should fill the container exactly if it has a capacity of 1 litre.

The litre – a closer look



Help your child practise reading the litre in both fraction and decimal form by asking questions such as:

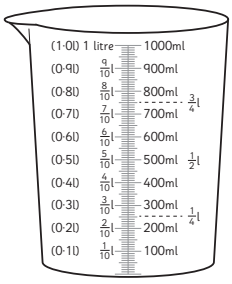
- *How many millilitres are in 0·6l?*
- *What is another name for $^{5}/_{10}$l?*
- *How many ml are in $^{2}/_{100}$l?*
- *What is 420ml in fraction and decimal form?*
- *How many ml are in $^{93}/_{100}$l?*
- *How many ml are in 0·62l?*
- *How many ml are in 2 $^{1}/_{2}$l?*
- *What is 2l 450ml in decimal form and fraction form?*

Using a measuring jug

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

Extension: After measuring out a specific amount of water (e.g. 500ml), invite your child to pour the water into a selection of containers of different shapes and sizes. This will demonstrate to him/her that 500ml can look very different in a large, wide container as opposed to a tall, narrow container – the containers can distort our view of capacity.

Cooking and baking at home



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

Shopping trip

Bring your child grocery shopping with you. Encourage him/her to find the capacity written on a variety of grocery products, e.g. How many ml are in the tin of soup, carton of milk, tub of cream, bottle of sparkling water?

Container hunt

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

Extension: Extend the search by looking for containers that hold certain capacities, e.g. 300–500ml, 600–750ml.

Number sentences/patterns

Your child will be learning about number sentences over the coming days. Your child needs to know the mathematical language associated with number sentences: numerals, symbols, number sentences, equal to, has the same value as, balance, tilt, scales, true, false, correct, incorrect, answer is, add, subtract.

The equals sign

The equals sign or equality sign (=) is a symbol used in mathematics to show equality. Many children do not fully understand what the equals sign (=) actually means. Some think it means the answer is. It is important that your child understands that the equals sign (=) means has the same value as.

The mystery number

Play the following game with your child. Say: I am thinking of a number. I add 4. My answer is 12. What is my number? Or: I am thinking of a number. I divide it by 3. My answer is 5. What is my number?

Invite your child to work out the answer and explain and justify his/her reasoning.

Balance the scales

Place three cups on one side of the balance scale. The scales will tilt. Ask: How many cups must I put on the other side of the scale in order for the scales to balance? Yes, three! Therefore, three cups = (has the same value as) three similar cups.

Now place six cups on one side of the scale and four cups on the other side. The balance will tilt. Ask: How many more cups do I need to add in order for the scales balance? Yes, two! Therefore, 6 has the same value as 4 and 2. Write a number sentence for this on a piece of paper: 6 = 4 + 2 or 4 + 2 = 6.

Invite your child to devise a word problem for this number sentence. Example: There are 6 children in Fourth Class. 4 of them are boys. How many of them are girls?

Proceed with more examples. Invite your child to write word problems for each of the number sentences.

Which operation?

Write various number sentences for your child, but leave out the operation sign (+ or –). Your child must work out the correct operation sign to make each number sentence true/correct. Ask your child to also explain and justify their reasoning. For example:

12 ○ 8 = 20
50 ○ 30 = 20
21 = 3 ○ 7

Invite your child to translate the number sentences into word problems.

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

In the number sentence above, your child could give an answer such as:

Seán bought 12 bananas, Rose bought 8. They bought 20 bananas altogether between them.

Shane spent 12c and Sara spent 8c. They spent 20c between them.

The missing number

Write various number sentences for your child, but this time leave out a number. Your child must work out the missing number to make each number sentence true/correct. Your child must also explain and justify their reasoning.

14 + 14 = 30 – __
81 ÷ 9 = 5 + __

Invite your child to translate the number sentences into word problems.

True or false?

Write various number sentences on a piece of A4 paper. Make sure that some are correct (true), but that more are incorrect (false).

Ask your child to determine which ones are true and which ones are false. They must also explain their reasoning. For example:

- *14 – 8 = 22 is false because it should be 6. This number sentence shows an answer where the person doing it added instead of subtracting.*
- *50 – 30 = 20. This is a correct answer.*
- *3 + 7 = 21 is false because it should be 3 multiplied by 7. This number sentence shows an answer where the person doing it added instead of multiplying.*