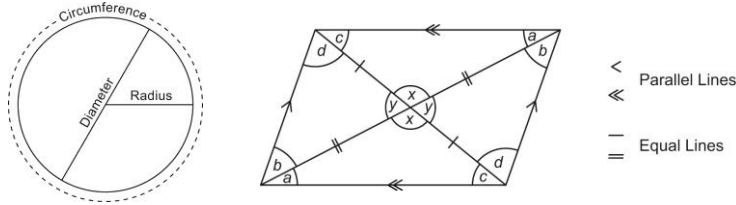# Properties of shapes

HERE'S THE MATHS

Your child is learning to draw and name parts of circles and understand that the diameter is twice the radius. The circumference is the distance around the edge of a circle. They are learning to draw 2-D shapes accurately and use conventional markings for lines and angles.

ACTIVITY

What to do
- Each draw a circle and inside it carefully draw a triangle with the vertices touching the circumference of the circle.
- Measure the length of each side of the triangle and calculate its perimeter.
- Find the midpoint of each side and join them to make a new triangle.
- Measure the perimeter of the new triangle.
- Discuss how this perimeter is related to the perimeter of the first triangle. (Perimeter of smaller triangle is half the first.)

Variation
- Use a different starting shape, e.g. a trapezium.

You will need:
- sharp pencil and paper
- compasses (or a circular shape to draw around)

QUESTIONS TO ASK

How are equal lines and angles marked in geometric diagrams?

What is the circumference of a circle?

What is the diameter of a circle?

How are the radius and diameter of a circle related?

Using the rule, d = 2r, what is the radius of a circle with a diameter of 6 cm (10 cm, 16 cm)? (*3 cm, 5 cm, 8 cm*)

Year 6 Maths Newsletter 9

Date: _____   **Name:** _____

MATHS TOPICS

These are the maths topics your child will be working on during the next three weeks:
- Addition, subtraction, multiplication and division
- Algebra
- Properties of shapes

KEY MATHEMATICAL IDEAS

During these three weeks your child will be learning to:
- use knowledge of the order of operations to carry out calculations involving the four operations
- use simple formulae
- illustrate and name parts of circles and know that the diameter is twice the radius, and draw 2-D shapes accurately, using conventional markings for lines and angles.

TIPS FOR GOOD HOMEWORK HABITS

Talk to your child about maths and use a wide range of vocabulary, e.g. in this unit, the vocabulary of the circle – radius, circumference, diameter and compasses.

Addition, subtraction, multiplication and division

Your child is learning to use knowledge of the order of operations to carry out calculations involving the four operations. The mnemonic for the order of operations is BODMAS.

B Brackets   **O O**rders (e.g. 3^2)   **DM D**ivision and **M**ultiplication
AS Addition and **S**ubtraction

Using the BODMAS rules, some possible arrangements for 2, 3 and 6 are:
$(2 \times 3) + 6 = 12$, $(2 \times 3) - 6 = 0$, $(6 \div 3) + 2 = 4$, $(6 \div 2) + 3 = 6$.

ACTIVITY

1	2	3	4	5	6
4 8 3	10 5 2	7 28 2	100 25 4	60 15 3^2	51 3 17

What to do
- Roll the dice to decide the numbers to work with from the boxes above.
- Set the timer for 2 minutes and each try to make as many different answers as possible using the BODMAS rules.
- Check each other's answers.
- Repeat. (Roll again if you roll a number you have already had.)
- The person with the greater number of answers scores a point.
- Play for 10 minutes or until a player reaches 5.

You will need:
- pencil and paper
- 1–6 dice
- timer (or phone with timer)

QUESTIONS TO ASK

5 ? (6 ? 2) = 40   (5 ? 6) ? 2 = 32
(5 ? 6) ? 2 = 22   5 ? (6 ? 2) = 20
What signs are needed to make each calculation correct?

4 ? (9 ? 3) = 10   (4 ? 9) ? 3 = 33
(4 ? 9) ? 3 = 12   4 ? (9 ? 3) = 1
What signs are needed to make each calculation correct?

Algebra

Your child is learning to use simple formulae and to express missing number problems algebraically. They are introduced to the formula for a straight line, $y = mx + c$. x and y are the values on the x- and y-axes, m describes the gradient of the line and c is where the line crosses the y-axis. Practise substituting formulae will give your child confidence handling equations.

ACTIVITY

1	2	3	4	5	6
$y = x + 4$	$y = 2x + 1$	$y = 3x + 2$	$y = x - 2$	$y = 4x - 2$	$y = 8 - x$

What to do
- One person rolls both dice, e.g. 3 and 4. Let the sum of the numbers be x.
- Substitute this value for x in the equations for the two numbers rolled. In this case, $y = 3 \times 7 + 2 = 23$ and $y = 7 - 2 = 5$.
- The score for the turn is $23 + 5 = 28$.
- The second person has a turn.
- Play for 10 minutes or until a score of 100 is reached.

Variation
- Write new formulae of your own.

You will need:
- pencil and paper
- two 1–6 dice

QUESTIONS TO ASK

Simplify $3a + 2b + 4a - b$. (*7a + b*)

Multiply out the brackets in $3(a + 2b)$. (*3a + 6b*)

In the equation, $2a = 4b + 4$, what is a when $b = 3$ (6, 8, 13)? (8, 14, 18, 28)

What are the possible values of a and b if $a + b = 5$? (*a 1, b 4; a 2, b 3; a 3, b 2; a 4, b 1*)