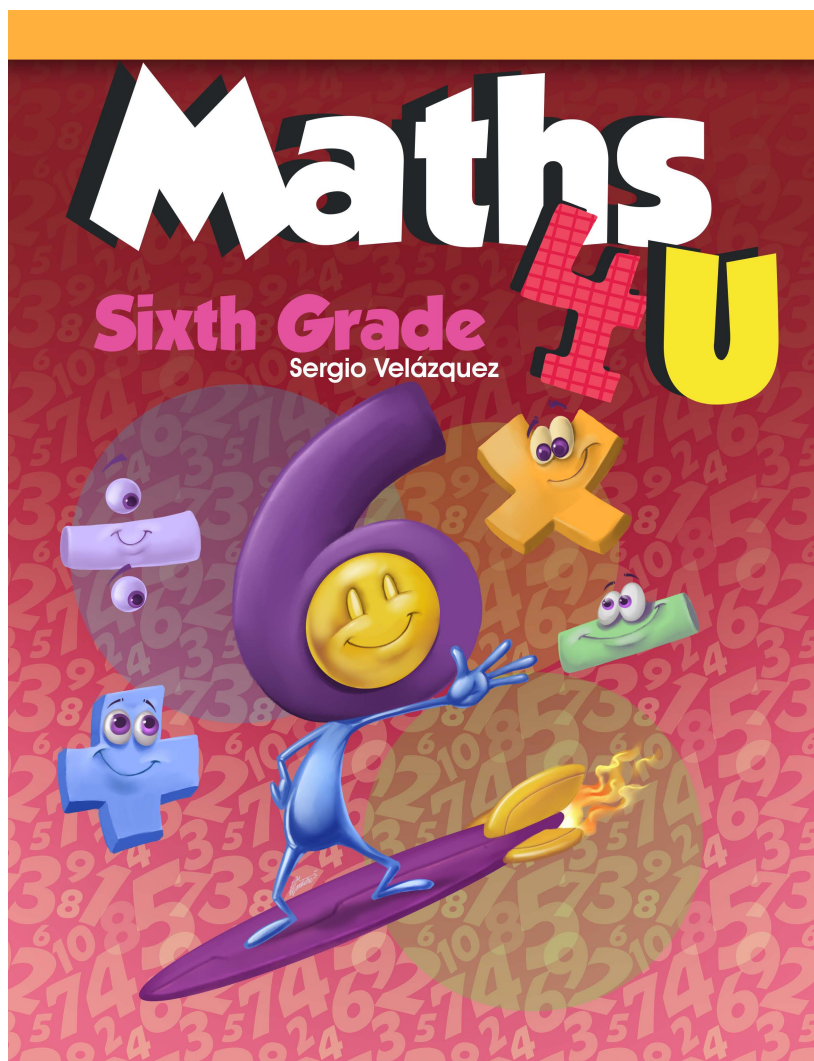




Maths 4 U Sixth Grade

Serie Maths 4 U

Libro metodología CLIL aplicada al aprendizaje y práctica de matemáticas en inglés como lengua extranjera.

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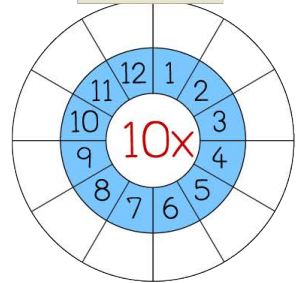
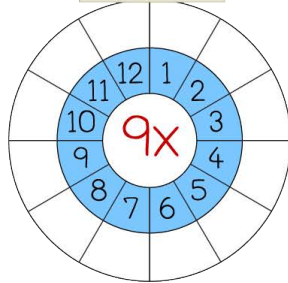
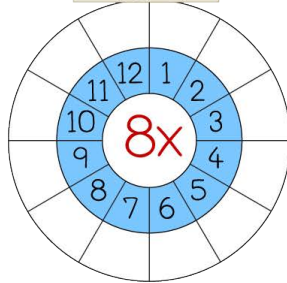
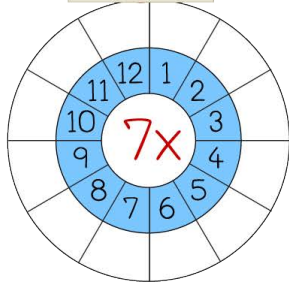
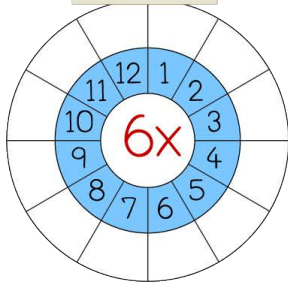
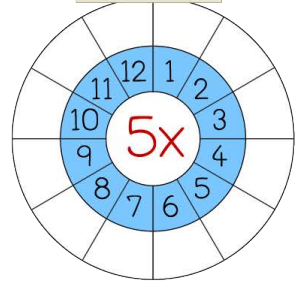
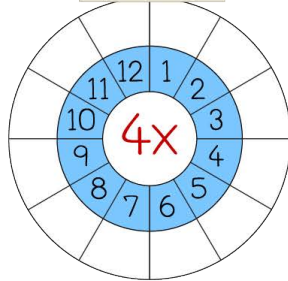
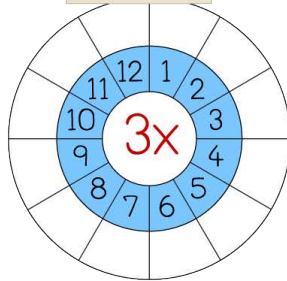
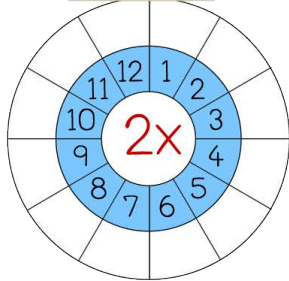
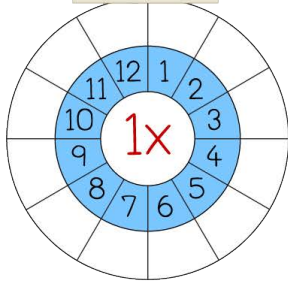
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Multiplication Circles to 10





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UNIT 1 Multiples



TAKE THE CHALLENGE



Read, colour and write.

Multiples of 2 end in

Multiples of 5 end in

Multiples of 10 end in

Multiples of 2 blue.

6	11	4
10	5	8
3	7	1
2	9	12

Multiples of 5 green.

2	11	65
10	5	8
3	7	1
2	9	35

Multiples of 10 orange.

60	11	40
10	5	80
3	7	1
2	9	120

Read and complete.

A multiple is a number made by multiplying together two other numbers. $6 \times 8 = \underline{\hspace{2cm}}$, so 48 is a common multiple of and .

The lowest or least common multiple (LCM) of 6 and 8 is 24.

Find two common multiples in each set.

a) 5

4

b) 6

8

c) 3

2

d) 7

4

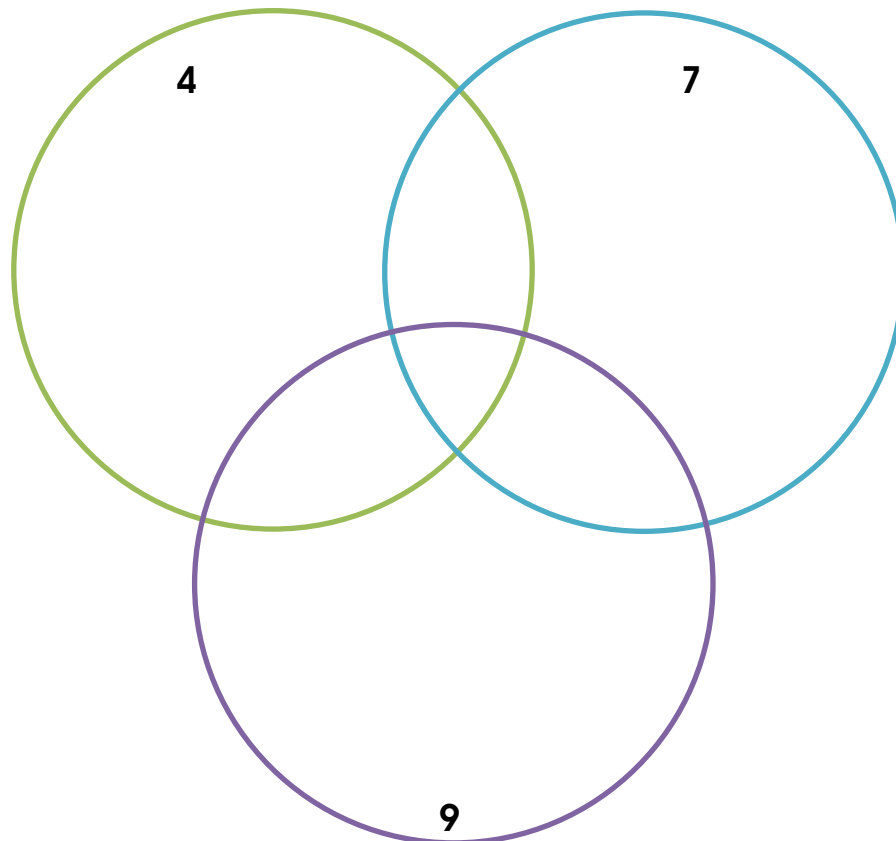




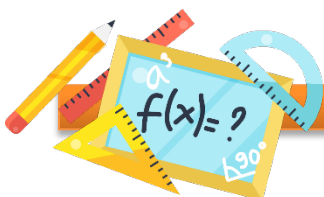
Find three common multiples in each set of numbers. Then circle the lowest common multiple (LCM).

- a) 3
4
8
- b) 5
6
9
- c) 6
7
4

Write all the multiples of the numbers up to 100. Then answer the question.



Did you find any common multiple for the three numbers? _____





You're up!

Look and put a tick if the number is a multiple of 3 or 5. If it is not a multiple, put a cross.

Number	Multiple of 3	Multiple of 5
21	✓	X
12		
8		
15		
6		
10		
30		

Read and answer the questions.

1. What are the multiples of 4 between 10 and 25?

.....

2. Which numbers are multiples of 6?

32 12 18 15 9 24 40

- a) I am a multiple of 4 c) I am even.
b) I am between 20 and 30. d) I am 2 less than a multiple of 10.

What number am I?





Factors



TAKE THE CHALLENGE



Look and write the missing factors. Then write, in your own words, what a factor is.

Factor: It
.....
.....

$$10 = _ \times 5$$

$$18 = _ \times _$$

$$36 = 2 \times 2 \times 3 \times \dots$$

$$24 = _ \times _$$

$$30 = _ \times _$$

$$60 = 2 \times 3 \times 2 \times \dots$$

$$32 = _ \times _$$

$$39 = _ \times _$$

$$75 = 5 \times 3 \times \dots$$

Read and complete.

Factors are whole numbers that will divide exactly into other whole numbers. A number which is a factor of two or more given numbers is called "The common factor of the given numbers."

Ex. 1.

Find the common factors of 60, 15 and 45

The factors of 60 are 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 and 60.

The factors of 15 are 1, 3, 5, and 15.

The factors of 45 are 1, 3, 5, 9, 15 and 45.

The common factors of 60, 15 and 45 are _____, _____, _____ and _____.

The highest common factor (HCF) is _____.

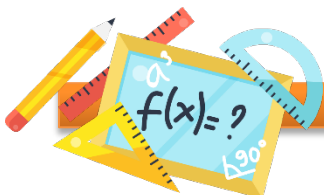


If a number only has two factors, itself and 1, then it is a "Prime number."

The prime factors of a number are all those factors of the number which are themselves prime numbers.

Ex. 2.

All the factors of 12 are 1, 2, 3, 4, 6 and 12, but its only prime factors are _____ and _____.





Find the common factors for each of these numbers. Then circle the highest common factor (HCF) for each set of numbers.

- a) 40
56
- b) 35
80
- c) 24
64
- d) 90
115

One way to work out prime factors is to use factor – trees.

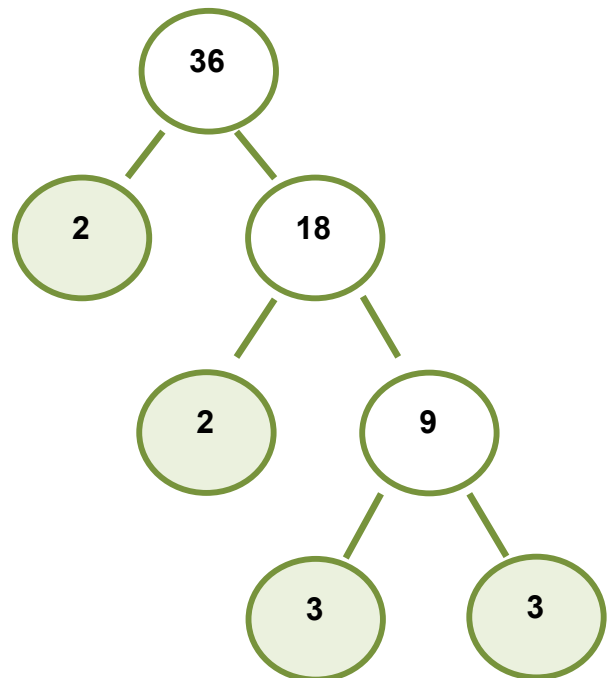
Ex. What are the prime factors of 36?
Start with any pair of factors of 36 and factorize them.

Continue until you get prime factors.

$$2 \times 2 \times 3 \times 3 = \underline{\hspace{2cm}}$$

$$2^2 \times 3^2 = \underline{\hspace{2cm}}$$

2 and 3 are prime factors of $\underline{\hspace{2cm}}$.





Draw factor trees for the following numbers.

48

56

90

132

14

42



You're up!

Look and write the factors of the numbers. Then read and complete the definition.

Number	Factors
1	1
2	2,1
3	
4	
5	
6	
7	
8	
9	
10	

Number	Factors
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Prime numbers:

They are numbers that have only 2 factors; 1 and themselves.

Now that you got the definition of Prime Numbers, go back to the table and colour all the boxes (from 1 to 20) that have prime numbers.





Squares, roots and powers



TAKE THE CHALLENGE



Read and match the operations with the answers in the first section, what are they called?

Read and solve the operations in the second section, what are they called?

$\sqrt{25}$

=

$\sqrt{81}$

=

$\sqrt{64}$

=

$\sqrt{49}$

=

$\sqrt{16}$

=

8

4

5

9

7

1^2

=

.....

2^2

=

.....

3^2

=

.....

4^2

=

.....

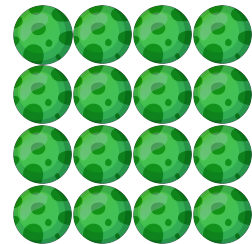
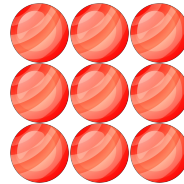
5^2

=

.....

Read and complete.

These are examples of squared numbers; when 2 identical whole numbers are multiplied together.



$1 \times 1 = \underline{\quad}$

$2 \times 2 = \underline{\quad}$

$3 \times 3 = \underline{\quad}$

$4 \times 4 = \underline{\quad}$

$1 \text{ squared} = \underline{\quad}$

$2 \text{ squared} = \underline{\quad}$

$3 \text{ squared} = \underline{\quad}$

$4 \text{ squared} = \underline{\quad}$

$1^2 = \underline{\quad}$

$2^2 = \underline{\quad}$

$3^2 = \underline{\quad}$

$4^2 = \underline{\quad}$

Solve these.

a) 9^2

b) 8^2

c) 18^2

d) 7^2

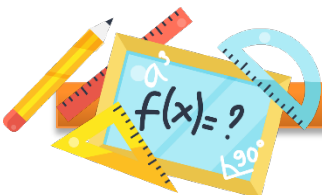
e) 11^2

f) 32^2

g) 6^2

h) 25^2

i) 44^2





Look carefully and solve these.

a) $5^2 + 2^2 = \dots\dots\dots$

d) $11^2 + 10^2 = \dots\dots\dots$

b) $4^2 + 9^2 = \dots\dots\dots$

e) $110^2 + 31^2 = \dots\dots\dots$

c) $18^2 + 13^2 = \dots\dots\dots$

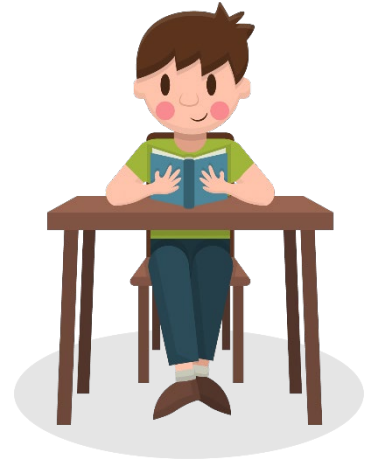
f) $25^2 + 12^2 = \dots\dots\dots$

Read and find the value of the numbers.

Sometimes you need to multiply a number by itself several times. $2 \times 2 \times 2 \times 2 = \dots\dots\dots$

A quick way to write this is 2^4 – 2 to the power of 4.

$2^4 = \dots\dots\dots$



Extended form

a) $3^4 = \dots\dots\dots = \dots\dots\dots$

b) $2^3 = \dots\dots\dots = \dots\dots\dots$

c) $10^3 = \dots\dots\dots = \dots\dots\dots$

d) $4^5 = \dots\dots\dots = \dots\dots\dots$

e) $5^4 = \dots\dots\dots = \dots\dots\dots$

Look and complete the chart.

Power	Base	Index	Meaning	Numeral
4^2	4	2	4×4	16
2^4				
	6	3		
			$5 \times 5 \times 5 \times 5$	
10^5				
	3			81





Calculating square roots

Read and answer the questions. Write complete math sentences.

a) What is 19^2 ?

.....

b) What is the next square number after 144?

.....

c) What is the square root of 361?

.....

d) What is 11^4 ?

.....

e) What is 14 squared?

.....

Read and write the square root of each of the numbers below.

On a calculator, there is a $\sqrt{\quad}$ symbol. This is called a **square root key**. The square root of a particular number is the number that was multiplied by itself to reach that number.



a) $\sqrt{64}$ _____

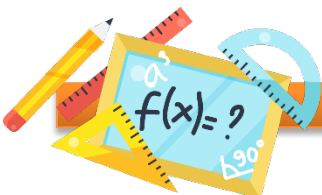
d) $\sqrt{900}$ _____

b) $\sqrt{25}$ _____

e) $\sqrt{144}$ _____

c) $\sqrt{81}$ _____

f) $\sqrt{49}$ _____





Read and calculate the square root.

A square root is the opposite of a square number. One way to calculate the square root is to divide the number by prime numbers until it is reduced to 1.

Ex.



$$\sqrt{484} =$$

$$484 \div 2$$

$$242 \div 2$$

$$121 \div 11$$

$$11 \div 11$$

$$1$$

$$\text{So, } 484 = 2 \times 2 \times 11 \times 11$$

$$= (2 \times 11) \times (2 \times 11)$$

$$= 22$$

$$= 22 \times 22 = 484$$

$$\sqrt{484} = 22$$

a) $\sqrt{576}$

b) $\sqrt{676}$

c) $\sqrt{961}$

d) $\sqrt{1225}$





You're up!

Look carefully and solve these.

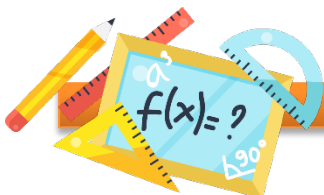
a) $\sqrt{64} + \sqrt{100}$

b) $\sqrt{289} - \sqrt{121}$

c) $\sqrt{1521} - \sqrt{1296}$

Estimate each of the following roots. Then use a calculator to check your estimates and, when the answer is not a whole number, round the number to the nearest tenth.

		Answer	Nearest tenth
a)	378	19.442222 ...	19.4
b)	162	_____	_____
c)	275	_____	_____
d)	730	_____	_____
e)	294	_____	_____
f)	502	_____	_____





UNIT 2 Mixed operations



TAKE THE CHALLENGE



Read and answer the questions.

Ruben just sold his house and his car and this is the list of things he bought.

Ruben sold his house for \$ 438 000 and his car for \$ 123 000. Before going to put the money in the bank, he bought a new apartment for \$ 195 000 and a motorbike for 85 000.

His wife asked him to buy a new pet. They got a puppy from the pet store for \$ 250.

Ruben also bought some pairs of shoes and sneakers for his children. He bought 3 pairs of shoes for \$ 350 each and 4 pairs of sneakers for \$ 420 each.

How much money did he get for the house and the car together?

How much money did he spend on shoes and sneakers?

How much money does he have left?

Did he need more money?

Read and complete the questions.

How do you interpret a mathematical statement when it has more than one operation?

Read:

$$6 + 2 \times 3 = \underline{\quad? \quad}$$

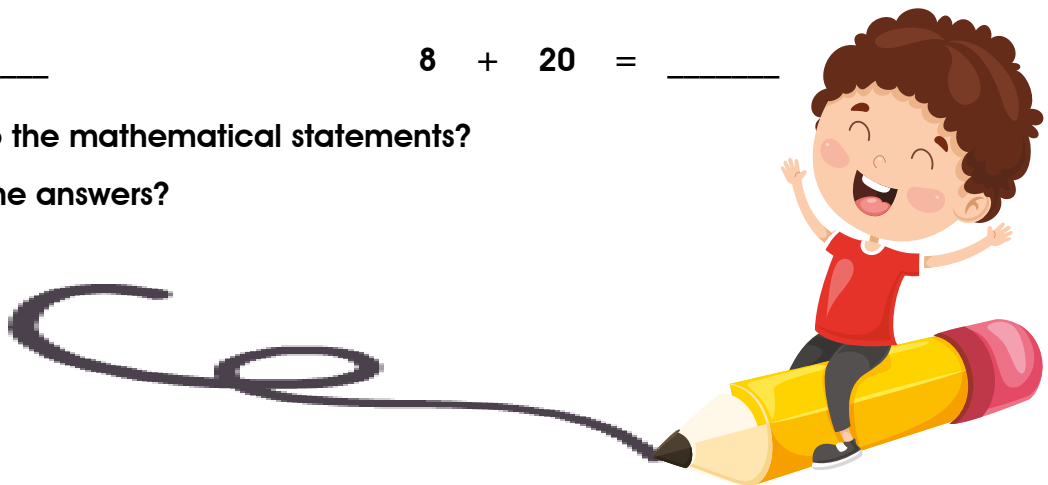
$$8 + 4 \times 5 = \underline{\quad? \quad}$$

$$6 + 6 = \underline{\quad \quad}$$

$$8 + 20 = \underline{\quad \quad}$$

What happened to the mathematical statements?

How did you find the answers?





If your answer was "I did the multiplication first!" then you were right! When it comes with working out mathematical statements of this type, you must follow a specific order that's been agreed upon. Remember, you have to go from left to right.

Read and check if you have to do the operations or cross if you don't need them now.

1) Parenthesis

2) Exponents

3) Multiplication or division

4) Addition or subtraction

$$9 + 7 \times 6 = \underline{\quad ? \quad}$$

=

So the answer is _____

Read and check or cross. Then follow the order and complete.

1) Parenthesis

2) Exponents

3) Multiplication or division

4) Addition or subtraction

$$(7 + 3) \times 5 \div 5 - 4 \times 2 = \underline{\quad ? \quad}$$

$$10 \times 5 \div 5 - 4 \times 2$$

$$50 \div 5 - 4 \times 2$$

$$10 - 8 = \underline{\quad \quad \quad}$$

What happens if you have a mathematical statement which has operations at the same level; this is multiplication and division or addition and subtraction, or an exponent?

- You just go from left to right!

$$2 + 3 - 2 + 5 - 1 = \underline{\quad ? \quad} \quad 9 \times 2 \div 3 \times 2 = \underline{\quad ? \quad} \quad 2 \times 3^2 = \underline{\quad ? \quad} \quad (2 \times 3)^2 = \underline{\quad ? \quad}$$

$$5 - 2 + 5 - 1 = \underline{\quad \quad \quad} \quad 18 \div 3 \times 2 = \underline{\quad \quad \quad} \quad 2 \times 9 = \underline{\quad \quad \quad} \quad 6^2 = \underline{\quad \quad \quad}$$

$$3 + 5 - 1 = \underline{\quad \quad \quad} \quad 6 \times 2 = \underline{\quad \quad \quad}$$

$$8 - 1 = \underline{\quad \quad \quad}$$





Look and solve these.

Remember:

- Follow the order of operations.
- Go from left to right.

Set 1

a) $12 - 4 \times 2 = \underline{\hspace{2cm}}$

b) $5 + 2^2 = \underline{\hspace{2cm}}$

c) $10 \times 2 - 4 = \underline{\hspace{2cm}}$

Set 2

d) $6 \times 4^2 = \underline{\hspace{2cm}}$

e) $8^2 + 6 = \underline{\hspace{2cm}}$

f) $4 + 2 \times 4 = \underline{\hspace{2cm}}$

Set 3

g) $(6 + 4)^2 + 5 = \underline{\hspace{2cm}}$

h) $4^2 + 2 - (2 + 3) = \underline{\hspace{2cm}}$

i) $2^2 + 2 + (4^2 + 1 + 2) = \underline{\hspace{2cm}}$





You're up!

Read and answer the questions. Then explain what you did to find the answer.

The sum of two numbers is seven and their difference is one.

What are the two numbers?

.....

.....

.....

.....

.....

A rectangular fence around a garden measures 28 meters. If the length of the fence is 6 meters, what is the width?

.....

.....

.....

.....

.....

Berta has a box of doughnuts that can be divided evenly among three and five friends.

What is the number of doughnuts that can be in the box?

.....

.....

.....

.....

.....

Frank is five years older than Bruce who is six years younger than Brat.

If Brat is twelve years old, how old is Frank?

.....

.....

.....

.....

.....





Multiplication



TAKE THE CHALLENGE



Read and answer the question. Use the grid to show the procedure.

Richard buys 3 litres of green paint and 2 litres of red paint.

If the green paint is \$16.95 a litre and the red paint is \$18.95 a litre, how much does Richard spend on paint?

Multiplying decimals

$$\begin{array}{r} 2.3 \\ \times 4.1 \\ \hline 23 \end{array}$$

Multiply the first number (the multiplicand) by the farthest-right digit of the multiplier. Ignore the decimal points for now.

$$\begin{array}{r} 2.3 \\ \times 4.1 \\ \hline 23 \\ 920 \end{array}$$

Multiply the first number (the multiplicand) by the farthest-left digit of the multiplier. Remember to put a zero as a place keeper, just like in multiplying whole numbers – keep ignoring the decimal points.

$$\begin{array}{r} 2.3 \\ \times 4.1 \\ \hline 23 \\ 920 \\ \hline 943 \end{array}$$

Add up the numbers (the partial products you just calculated), still ignoring the decimal points.







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Multiply the denominators.

Reduce the fraction, if necessary.

a) $\frac{3}{10} \times \frac{2}{2} =$

b) $\frac{2}{4} \times \frac{2}{3} =$

c) $\frac{2}{4} \times \frac{1}{2} =$

d) $\frac{1}{2} \times \frac{1}{4} =$

e) $\frac{3}{10} \times \frac{2}{4} =$

f) $\frac{1}{2} \times \frac{3}{5} =$

g) $\frac{2}{5} \times \frac{2}{10} =$

h) $\frac{7}{10} \times \frac{2}{5} =$



You're up!

Look and complete the puzzle.

$$\begin{array}{r} 1 \\ \text{---} \\ 2 \end{array}$$

$$\begin{array}{r} 1 \\ \text{X} \text{ ---} \\ 2 \end{array}$$

$$\begin{array}{r} \\ \text{---} \\ \end{array}$$

$$\begin{array}{r} 1 \\ \text{X} \text{ ---} \\ 4 \end{array}$$

$$\begin{array}{r} \\ \text{---} \\ \end{array}$$

$$\begin{array}{r} 1 \\ \text{X} \text{ ---} \\ 4 \end{array}$$

$$\begin{array}{r} 1 \\ \text{X} \text{ ---} \\ 2 \end{array}$$

$$\begin{array}{r} 1 \\ \text{X} \text{ ---} \\ 2 \end{array}$$

$$\begin{array}{r} \\ \text{---} \\ \end{array}$$

$$\begin{array}{r} \text{X } 1 \end{array}$$

$$\begin{array}{r} \\ \text{---} \\ \end{array}$$

$$\begin{array}{r} 1 \\ \text{X} \text{ ---} \\ 4 \end{array}$$

$$\begin{array}{r} \\ \text{---} \\ \end{array}$$

$$\begin{array}{r} 2 \\ \text{---} \\ 3 \end{array}$$

$$\begin{array}{r} 1 \\ \text{X} \text{ ---} \\ 3 \end{array}$$

$$\begin{array}{r} \\ \text{---} \\ \end{array}$$

$$\begin{array}{r} 1 \\ \text{X} \text{ ---} \\ 3 \end{array}$$

$$\begin{array}{r} \\ \text{---} \\ \end{array}$$

$$\begin{array}{r} 2 \\ \text{X} \text{ ---} \\ 3 \end{array}$$

$$\begin{array}{r} 2 \\ \text{X} \text{ ---} \\ 2 \end{array}$$

$$\begin{array}{r} 2 \\ \text{X} \text{ ---} \\ 2 \end{array}$$

$$\begin{array}{r} \\ \text{---} \\ \end{array}$$

$$\begin{array}{r} 1 \\ \text{X} \text{ ---} \\ 2 \end{array}$$

$$\begin{array}{r} \\ \text{---} \\ \end{array}$$

$$\begin{array}{r} 1 \\ \text{X} \text{ ---} \\ 3 \end{array}$$

$$\begin{array}{r} \\ \text{---} \\ \end{array}$$





Division



TAKE THE CHALLENGE



Read and answer the question. Use the grid to show how you found the answer.

Susan's car gets 29.7 miles per gallon on the highway.

If her fuel tank holds 10.45 gallons, then how far can she travel on one full tank of gas?

Look and answer the question. Then solve the divisions.

- Do you remember how to work out divisions?

$$\begin{array}{r}
 2191 \\
 4 \overline{) 8764} \\
 \underline{8} \\
 07 \\
 \underline{4} \\
 36 \\
 \underline{36} \\
 04 \\
 \underline{4} \\
 0
 \end{array}$$

$$\begin{array}{r}
 21 \\
 216 \overline{) 4536} \\
 \underline{4} \\
 216 \\
 \underline{216} \\
 0
 \end{array}$$

$$\begin{array}{r}
 17 \\
 31 \overline{) 546} \\
 \underline{3} \\
 236 \\
 \underline{2} \\
 17 \\
 \underline{1} \\
 9
 \end{array}$$

Remainder 19.





Dividing decimals

Read and look. Then work out the divisions.

$$\begin{array}{r} 3.61 \\ 7 \overline{) 25.3} \\ \underline{- 21} \\ 43 \\ \underline{- 42} \\ 10 \end{array}$$

Steps:

1. Bring the decimal point straight up.
2. Bring down the 3 to continue dividing, but don't bring down the decimal point.
3. No more digits to bring down so just add a zero.

$$25.3 \div 7 = 3.6 \text{ (rounded to the nearest hundredth)}$$





"Remember to use the grid for procedures."

$7.82 \div 4 =$

$6.35 \div 5 =$

$18.27 \div 3 =$

$45.62 \div 7 =$

$23.96 \div 3 =$

$65.32 \div 9 =$

$40.24 \div 8 =$

$62.74 \div 2 =$





Dividing fractions

Read and look. Then work out the divisions.

Invert the fraction that you are dividing by.

$$\frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2}$$

Multiply the numerators and denominators.

$$\frac{4}{5} \times \frac{3}{2} = \frac{12}{10}$$

Simplify the fraction, if necessary.

$$\frac{12}{10} = 1 \frac{1}{5}$$

a)

$$\frac{2}{4} \div \frac{3}{4} =$$

b)

$$\frac{1}{4} \div \frac{1}{2} =$$

c)

$$\frac{3}{9} \div \frac{1}{3} =$$

d)

$$\frac{1}{5} \div \frac{1}{3} =$$

e)

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

f)

$$\frac{1}{2} \div \frac{5}{8} =$$

g)

$$\frac{7}{8} \div \frac{1}{6} =$$

h)

$$\frac{1}{2} \div \frac{6}{9} =$$







Fractions



TAKE THE CHALLENGE



Read and answer the question.

Ben has a recipe that calls for $\frac{2}{4}$ of a cup of milk.
He only has a $\frac{1}{2}$ measuring cup.

How many times should Ben fill his measuring cup to get the right amount?
Explain what you did to find the answer.

.....

.....

.....

Equivalent fractions

Read and colour.

We say two fractions are equivalent when they represent the same amount.

--	--	--	--

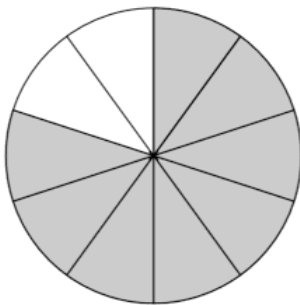
$$= \frac{2}{4}$$

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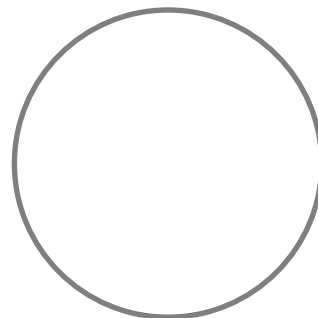
$$= \frac{1}{2}$$



Look at the pictures and draw the representation of an equivalent fraction.



=





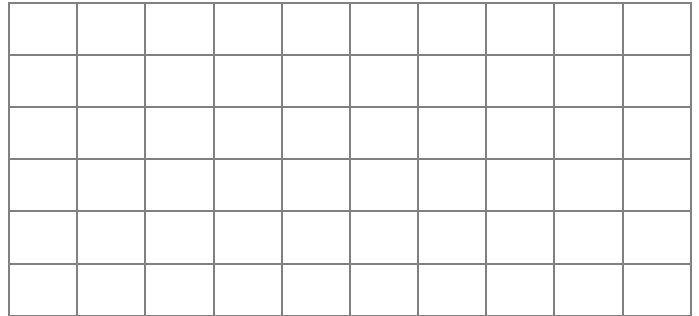


Multiplying to find equivalent fractions

Read and answer the question.

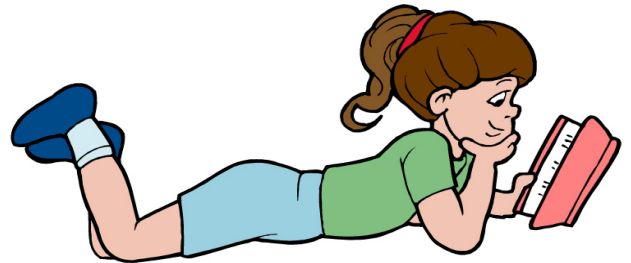
Sam said $\frac{3}{4}$ of the chocolates were eaten, but Sara thought $\frac{9}{12}$ of them were eaten. Their mum said both kids were correct. Why were they both right?

.....
.....
.....
.....



Read, look and write the missing numbers.

Equivalent fractions can be found by multiplying both numerator and denominator by the same non-zero number.



a) $\frac{5}{6} \times \frac{\quad}{\quad} = \frac{20}{24}$

b) $\frac{3}{15} \times \frac{\quad}{\quad} = \frac{15}{75}$

c) $\frac{2}{7} \times \frac{\quad}{\quad} = \frac{6}{21}$

d) $\frac{8}{2} \times \frac{\quad}{\quad} = \frac{32}{8}$

e) $\frac{15}{7} \times \frac{\quad}{\quad} = \frac{75}{35}$

f) $\frac{8}{16} \times \frac{\quad}{\quad} = \frac{16}{32}$

Look and write the equivalent fraction.

a) $\frac{7}{8} \times \frac{\quad}{\quad} = \frac{\quad}{16}$

b) $\frac{3}{5} \times \frac{\quad}{\quad} = \frac{\quad}{25}$

c) $\frac{9}{16} \times \frac{\quad}{\quad} = \frac{\quad}{64}$

d) $\frac{4}{5} \times \frac{\quad}{\quad} = \frac{\quad}{45}$

e) $\frac{7}{15} \times \frac{\quad}{\quad} = \frac{\quad}{30}$

f) $\frac{5}{12} \times \frac{\quad}{\quad} = \frac{\quad}{36}$





Read and order the fractions. Then answer the question.

$\frac{8}{4}$ • $\frac{5}{9}$ • $\frac{7}{2}$ • $\frac{3}{8}$ • $\frac{6}{5}$

Smallest fraction →

What did you do to find the correct ordering?

.....

.....

.....

Comparing fractions

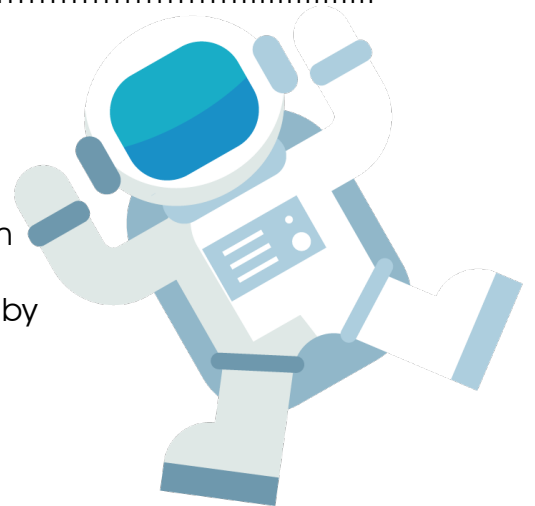
Read and complete.

First you need to write the fractions as equivalent fractions with the same denominator.

To compare $6/3$ and $5/4$, you have to multiply the fraction by the denominator of the other fraction.

$$\frac{6}{3} \times 4 = \frac{6 \times 4}{3 \times 4} = \frac{24}{12}$$

$$\frac{5}{4} \times 3 = \frac{5 \times 3}{4 \times 3} = \frac{15}{12}$$



Now you can compare: $\frac{24}{12}$ is more than $\frac{15}{12}$

Compare the fractions – write the complete procedure.

a)	4	&	8																
	12		9																





b)	$\frac{8}{6}$	&	$\frac{21}{7}$																

c)	$\frac{11}{4}$	&	$\frac{25}{2}$																

d)	$\frac{77}{8}$	&	$\frac{56}{3}$																

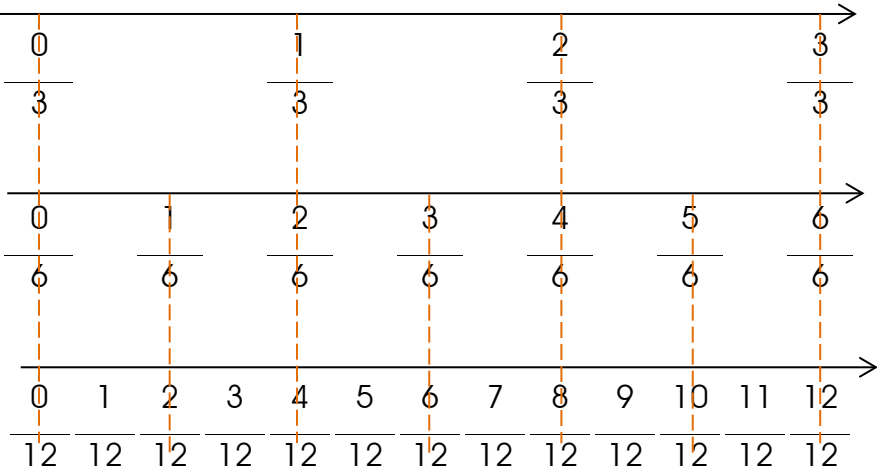
e)	$\frac{4}{7}$	&	$\frac{6}{8}$																

Read and answer the question.

Look at the number lines on the right. The dotted lines between the number lines show fractions that are equivalent.

Use the number lines on the right – find and circle all the fractions between $\frac{1}{3}$ and $\frac{2}{3}$.

What did you learn from the previous activity?



Read and complete.

To find a fraction between fractions you have to:

1) Add the numerators together and denominators together.

$$\frac{4}{6} \quad \text{and} \quad \frac{8}{9} = \frac{4}{6} + \frac{8}{9} = \frac{12}{15}$$



$12/15$ lies between $4/6$ and $8/9$. To find the exact halfway, you should follow this procedure:

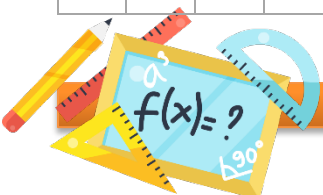
2) List the factors of both numbers and spot the GCF.

$12 = 1, 2, 3, 4, 6, 12$
 $15 = 1, 3, 5, 15$

Now divide both numbers in the fraction by the GCF you found.

$$\begin{array}{l} 12 \div 3 = 4 \\ 15 \div 3 = 5 \end{array} \quad \text{So } \frac{4}{5} \text{ is the fraction that lies exactly halfway between } \frac{4}{6} \text{ and } \frac{8}{9}$$

Look and find a fraction in between. Then find the halfway between them.



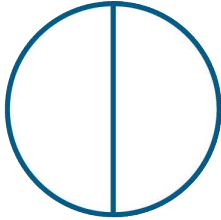


You're up!

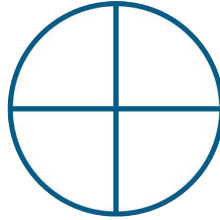
Look, colour and write equivalent fractions.

a)

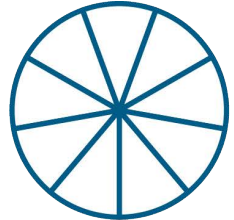
$$\frac{1}{2}$$



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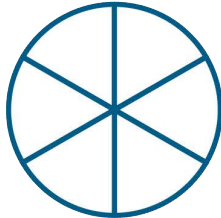


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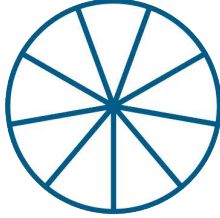


b)

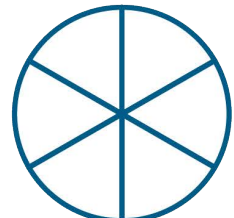
$$\frac{1}{2}$$



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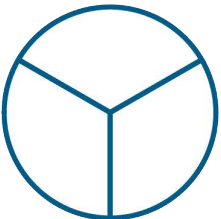


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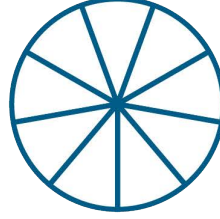


c)

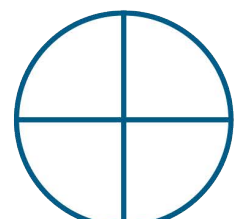
$$\frac{1}{3}$$



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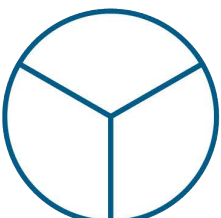


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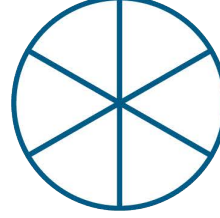


d)

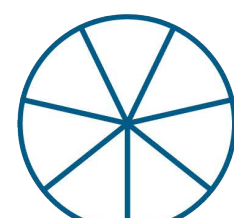
$$\frac{2}{3}$$



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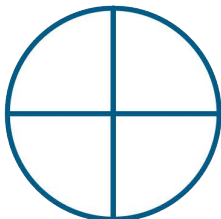


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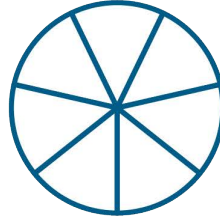


e)

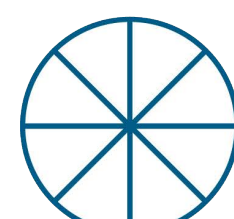
$$\frac{1}{4}$$



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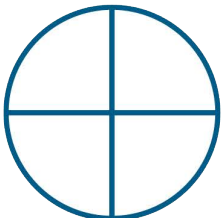


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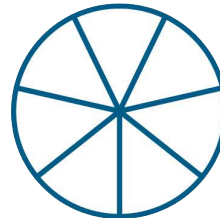


f)

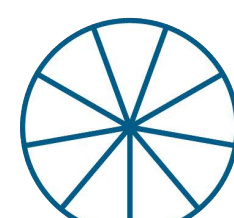
$$\frac{3}{4}$$



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UNIT 3 Polyhedra



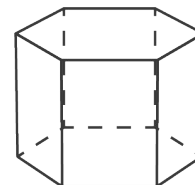
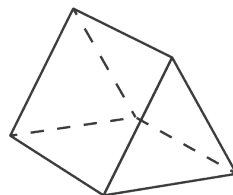
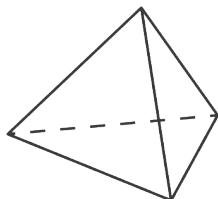
TAKE THE CHALLENGE



Look and fill in the chart. Then walk around school. Find a shape of each type and explain why you think it is there and why it fits that place.

If you cannot find them at school, just think of where you could.

Shape



Name

.....

.....

.....

Number of sides

.....

.....

.....

Where at school

.....

.....

.....

Why it fits there

.....

.....

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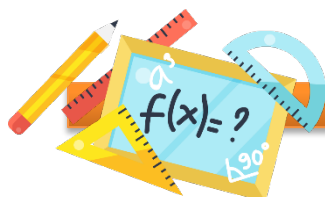
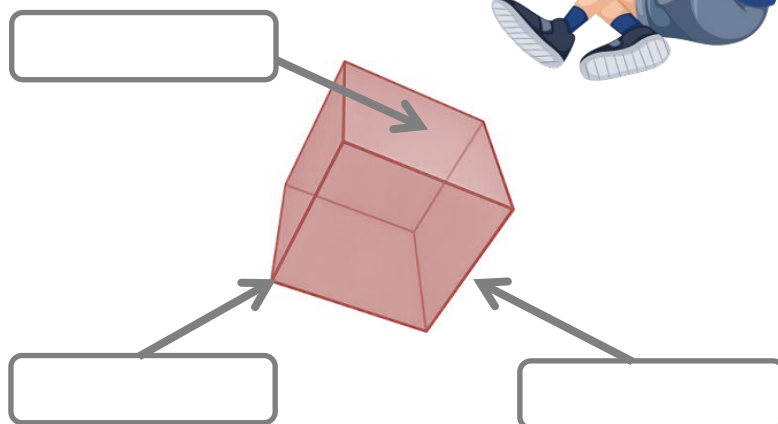
Read and label the picture and complete.

A polyhedron is a solid shape with flat faces. The meaning of the word is "**many faces**." Each face is a **polygon (a flat shape with straight sides)**. These shapes are made up of faces, vertices and edges.

3D shapes can be described in three ways:

1. Faces – the sides of the shape.
2. Vertices – the corners.
3. Edges – where the faces meet.

- A cuboid has faces.
- A cuboid has vertices.
- A cuboid has edges.





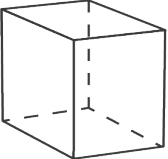
Euler's Formula

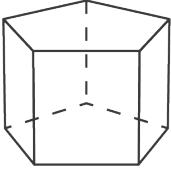
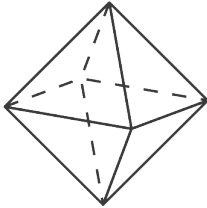
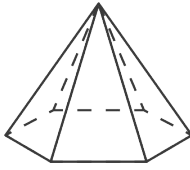
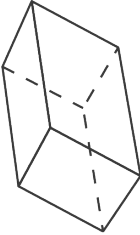
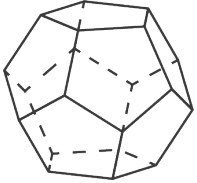
Read and complete the chart. Then use the formula to check your answers.

When we count the number of faces (the flat surfaces), vertices (corner points) and edges of a polyhedron, we discover an interesting thing:

The number of faces + the number of vertices – the number of edges = 2.

Example:

Shape	Number of faces	Number of vertices	Number of edges
			
F + V – E = 2	_____ + _____ = _____	_____ – _____ = 2	

Shape					
Name	.....	.....	.....	.....	.....
Faces	.....	.....	.....	.....	.....
Vertices	.....	.....	.....	.....	.....
Edges	.....	.....	.....	.....	.....
Formula (numbers)	.....	.....	.....	.....	.....





Net and solid

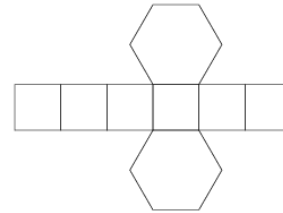
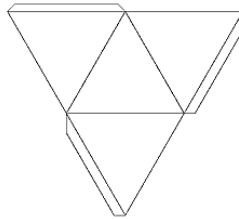
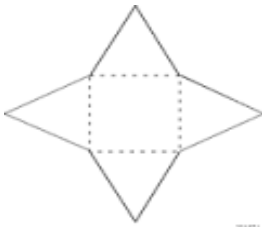
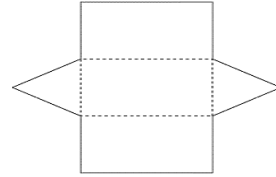
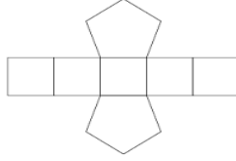
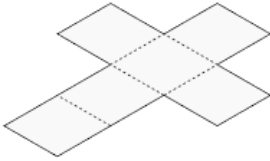
Read and write the name of the shape.

This is what a shape looks like when it is opened out flat.

Triangular Prism
Pentagonal Prism

Hexagonal Prism
Cube

Tetrahedron
Square Based Pyramid



Find some of the shapes named before in the objects you use every day. Then glue pictures and write what they are and the shapes they are / have.

Item

Name

Shape



.....

.....



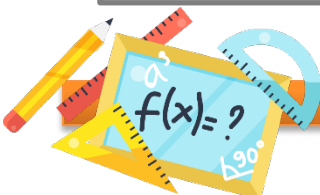
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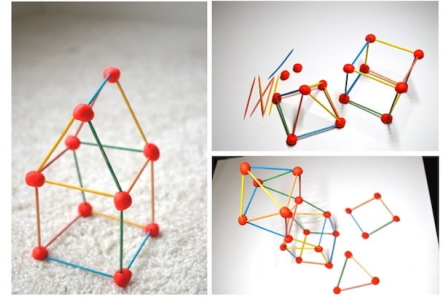




You're up!

Use toothpicks and clay to make shapes. Then take a picture of each and glue them in the boxes.

How many shapes did you make?



.....

.....

.....

.....





Graphs and what they say



In groups, choose one topic and make a graph – interview all the kids in your class to get information to work with.

- Favourite colour
- Favourite animal

- Favourite flavour
- Favourite movie

[illegible]

.....

.....

.....





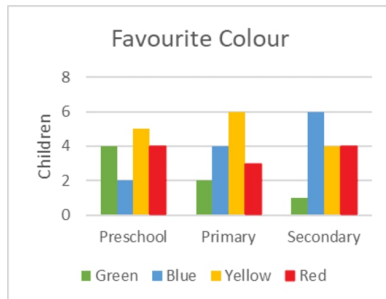
Look and match the pictures with the definitions. Then use the words in the box to label the graphs.

Pie chart

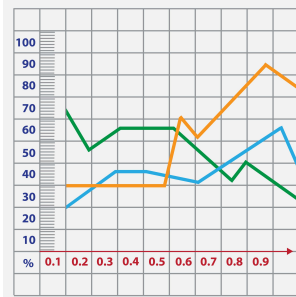
Bar graph

Pictograph

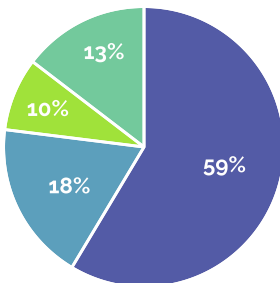
Line graph



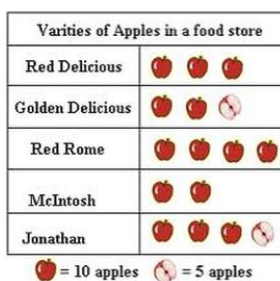
Shows data with a circle which is divided from its centre into several parts to show how the total's divided.



Compares choices. It answers to the questions How much ...? How many...?



Shows data with rectangular bars with heights and lengths proportional to the values they represent.



Shows how a variable changes over time.



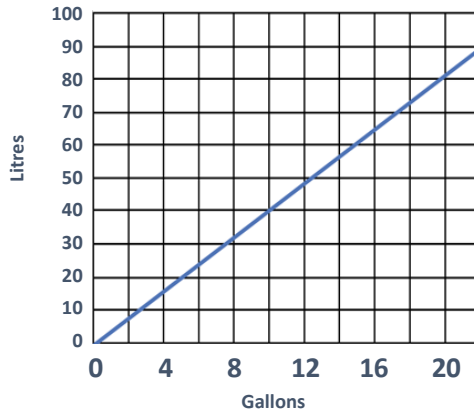


Conversion graph

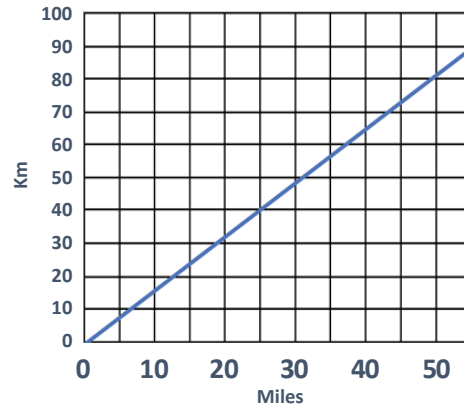
Read and use the graph to complete the statements.

It is a type of line graph that shows the relationship between two units of measurement.

**Conversion graph:
Gallons - Litres**



**Conversion graph:
Miles - Kilometres**

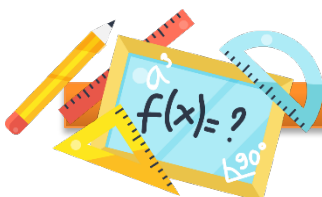
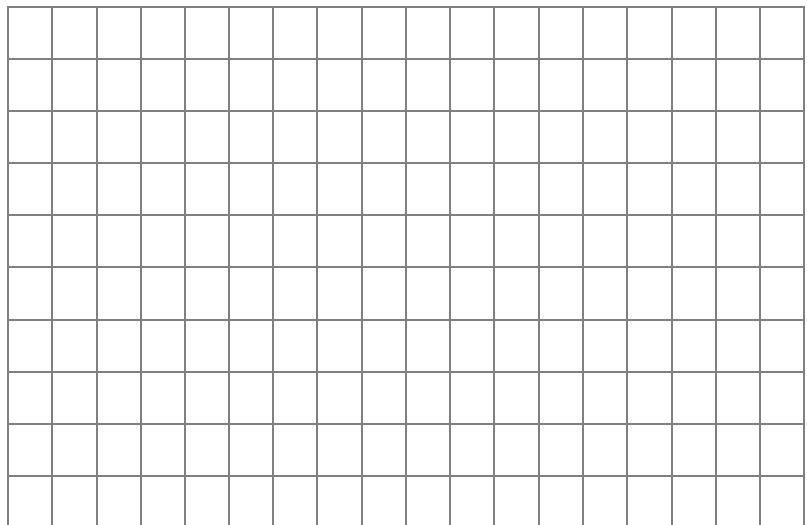


1. Convert 8 gallons to litres: _____ litres = 8 gallons.
2. Convert 80 litres to gallons: _____
3. Convert 14 gallons to litres: _____
4. Convert 15 miles to kilometres: _____
5. Convert 80 kilometres to miles: _____

Make your own conversion graph using the relation between US dollars and Mexican pesos.

Write down some important information you may need for the conversion.

.....





Understanding more about graphs

Read and answer the question.

Sandy has 4 candies, Nina has 5 candies and Gina has 3 candies.

What is the mean number of candies each of them has?

Tip:

Students need to share to find the answer.

To understand the given data, it is really important to find the average.

Average:

It is a number that tells you what most of the values, in the data set, are closer or similar to.

There are three types of average: mean, median and mode.

Mean:

It is the total number divided by the number of items.

Sandy - 4



Nina - 5



Gina - 3



$4 + 5 + 3 = 12$. If the girls are going to share the candies and everybody has to have the same number, you add and then divide: $12 \div 3 = 4$.

Each girl will have 4 candies, so **the mean number is 4**.

Look and find the mean number for each set.

Mean
number

\$ 22	\$ 36	\$ 51	\$ 45	\$ 96	
952 g	541 g	218 g	233 g	146 g	
56 km	75 km	83 km	23 km	63 km	
13 books	34 books	22 books	4 books	67 books	





Median:

It is the middle value of a set of data arranged in order. When there is an **even number of values**, the median is the mean of the two middle values.

5, 7, 9, 11, 15 = the median is 9 because it is the number in the middle, but for **10, 12, 14** and **16**, you need to add $12 + 14 = 26$ then $26 \div 2 = 13$, so **13 is the median**.

Look and find the median.

a) Kilometres run by each participant. Median = _____

Joe	Ben	Tom	Frank	Dylan	Ron
5	7.5	6	3.4	8.1	9



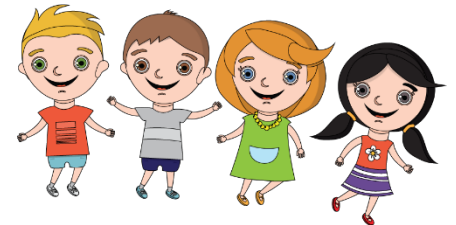
b) Number of boxes in each room. Median = _____

Room 1	Room 2	Room 3	Room 4	Room 5	Room 6
15	11	17	13	18	13



c) Salaries. Median = _____

Person 1	Person 2	Person 3	Person 4	Person 5
\$ 4 000	\$ 5 000	\$ 3 000	\$ 6 000	\$ 2 000



Mode:

It is the value that appears the most often or has the highest frequency in the data set. This is the number of toys that each student has in Mrs Rosa's classroom.

Student 1	Student 2	Student 3	Student 4	Student 5	Student 6	Student 7	Student 8
3	2	2	3	6	5	3	1

Which (value) number appears the most? _____, so the mode for this set is _____.





This is the number of visitors that the City Zoo has per year.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
560	324	765	700	560	700	850	560	300	765	450	800

Which (value) number appears the most? _____, so the mode for this set is _____.

Range:

It is the difference between the greatest value and the smallest value in each set of data.

The following chart shows the number of balls each player threw at the game.

Player 1	Player 2	Player 3	Player 4	Player 5
11	8	15	5	9

The greatest number is 15 and the smallest is 5 so: $15 - 5 = 10$. **The range is 10.**

Look and find the mean, median and mode for each.

Basketball Points				
6	22	12	36	19
a) mean: b) median: c) mode:				

Golf Scores					
93	70	90	90	68	75
a) mean: b) median: c) mode:					

Data	Mean	Median	Mode
a) 10, 17, 10, 14, 19			
b) 18, 19, 64, 19, 32, 60, 61			
c) 11, 38, 13, 38, 40			
d) 12, 15, 11, 15, 13, 10, 15			





You're up!

Use the grid to draw a graph and give complete information (mean, median, mode and range).

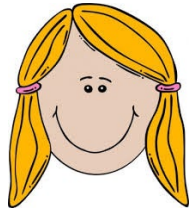
a) Students and number of books they have read.

Adam



40

Maria



24

Scott



64

Frank

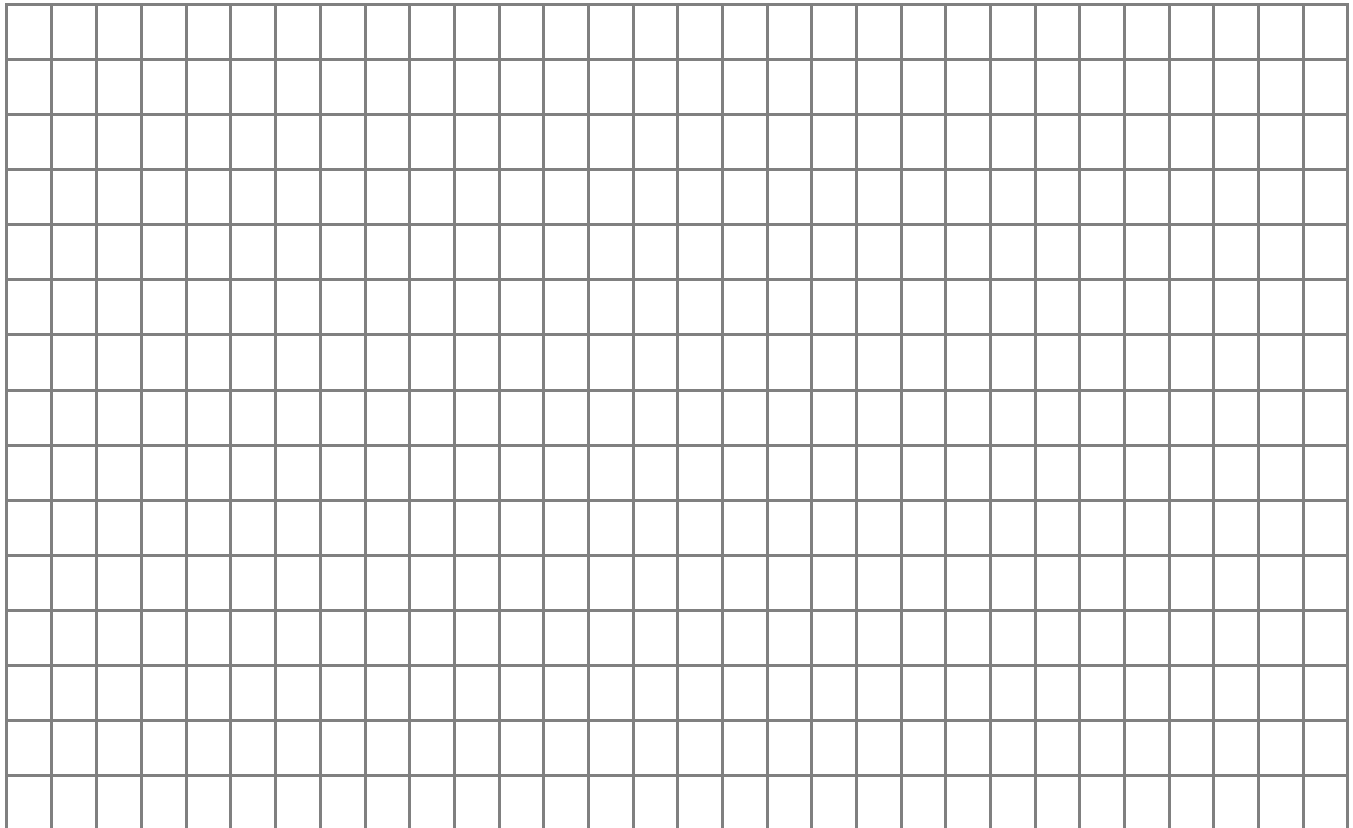


32

Linda



56

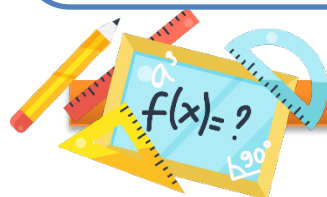


Mean: _____

Median: _____

Mode: _____

Range: _____





Converting fractions to decimals and decimals to fractions



TAKE THE CHALLENGE



Read and answer the question.

Marco used the following steps to form a number pattern.

- The first term is 3.
- The second term is 5.

c) Each term after the second is the sum of the two terms just before it.
The list shows the first five terms in Marco's pattern.

3, 5, 8, 13, 21, ...

What are the next 3 terms?

- 27, 34, 42
- 29, 37, 45
- 34, 55, 89
- 34, 55, 99

Use the words to label the image below.

Fraction

Numerator

Denominator

Whole



4

$\frac{4}{8}$

$\frac{1}{8}$

Read and match.

Fractions consist of three parts:

- | | | | |
|--------------|---|---|--|
| Numerator | ● | ● | It goes between the numbers. |
| Fraction bar | ● | ● | It is the bottom part of the fraction. |
| Denominator | ● | ● | It is the top part of the fraction. |

Read and complete the sentences.

A pizza might be cut into 8 pieces. In a fraction, the number 8 would be _____.

If you take four slices of that pizza, the number 4 would be _____.





Read and choose the correct words for the explanation.

Decimals **do use** / **do not use** a slash to indicate what part of the whole they represent. Instead, the decimal point means that the numbers **are below** / **are not below** one.

Without a decimal / **With a decimal**, the whole is considered to be based on 10, 100, 1000, etc. It all depends on how many spaces to the right of the decimal the number goes.

Look at the example:

$$0.05 = \text{five-hundredths} = 5 / 100$$



Converting fractions to decimals by using division - the "Simplest method."

The following fraction can be stated as:

$$2 / 3 \text{ is } 0.66$$

$$2 \text{ divided by } 3 \text{ is } 0.66$$

$$2 \div 3 = 0.66$$

Can you explain how this operation is done and how the result is read?

Convert these to decimals.

a) 8

$$\frac{\quad}{40} =$$

b) 6

$$\frac{\quad}{10} =$$

c) 18

$$\frac{\quad}{20} =$$

d) 1

$$\frac{\quad}{6} =$$

e) 8

$$\frac{\quad}{10} =$$

f) 2

$$\frac{\quad}{4} =$$

g) 32

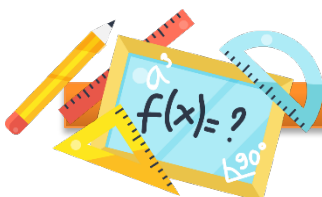
$$\frac{\quad}{50} =$$

h) 32

$$\frac{\quad}{40} =$$

i) 2

$$\frac{\quad}{20} =$$





Method 2

Convert a fraction to a decimal – the whole process.

- Find a number to multiply the denominator by so that it becomes 10, 100, etc.
- Multiply both numerator and denominator by the number you found.
- Write the top number with the decimal point.

$$\frac{3}{4} = \frac{3}{4} \times \frac{25}{25} = \frac{75}{100} \quad \text{so } \frac{3}{4} \text{ converted to decimals is } 0.75.$$

Convert these fractions to decimals following the whole process.

3						
—	=	—	X	—	=	—
5						

so --- converted to decimals is _____.

8						
—	=	—	X	—	=	—
25						

so --- converted to decimals is _____.

17						
—	=	—	X	—	=	—
20						

so --- converted to decimals is _____.

5						
—	=	—	X	—	=	—
125						

so --- converted to decimals is _____.





Convert a decimal to a fraction

The whole process

- Write down the decimal divided by 1.
- Multiply both top and bottom by 10, 100, 1000, etc. (depending on the numbers that are after the decimal point).
- Simplify / reduce the fraction.

0.75		100		75		15		3
$\frac{\quad}{\quad}$	X	$\frac{\quad}{\quad}$	=	$\frac{\quad}{\quad}$	=	$\frac{\quad}{\quad}$	=	$\frac{\quad}{\quad}$
1		100		100		20		4

Convert these decimals to fractions following the whole process.

0.625

2.35

Below are the answers for the questions on the next page. Read and convert the decimals to fractions. Then write the letter for the correct answer.

A

$$\frac{16}{25}$$

B

$$\frac{17}{40}$$

C

$$\frac{79}{80}$$

D

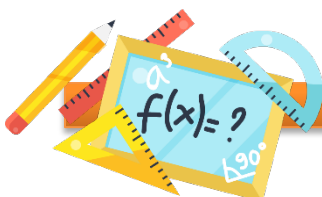
$$\frac{17}{20}$$

F

$$\frac{3}{8}$$

G

$$\frac{33}{40}$$





$$0.85 = \underline{\hspace{2cm}}$$

$$0.64 = \underline{\hspace{2cm}}$$

$$0.375 = \underline{\hspace{2cm}}$$

$$0.825 = \underline{\hspace{2cm}}$$

$$0.425 = \underline{\hspace{2cm}}$$

$$0.9875 = \underline{\hspace{2cm}}$$





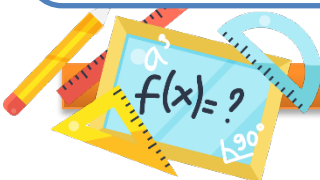
There were 120 words to study and categorize. Group 6A categorized 1/3 of the words, 6B categorized 1 / 2 of the words and 6C categorized 1 / 6 of the words.

$$6A = \underline{\hspace{2cm}}$$

6B = _____

$$6C = \underline{\hspace{2cm}}$$

A cartoon illustration of a boy and a girl interacting with a giant open book. The boy, with dark curly hair and wearing a green and white striped shirt and black shorts, stands on the left page of the book, holding a small open book. The girl, with blonde hair in a ponytail and wearing a blue shirt and pink pants, lies on her stomach on the right page, reading a small open book. The book is light brown with many pages visible. Below the illustration is a table with two empty square boxes.

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form a uniform pattern of small squares across the entire surface. There are no margins, text, or other markings on the paper.



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- how to compare fractions.
- the answer as both fractions and decimals.

[illegible]



UNIT 4 Volume of cubes, prisms and pyramids



TAKE THE CHALLENGE



Look at the board below and add up numbers as you go.

Notice that you have to start at the bottom left (number 5 in green) and finish at the right top (number 4 in blue).

You can go one square at the time in any direction (up, down, left or right).

Can you find the way to make exactly 53?

What is it? _____

Can you find the way to make exactly 60?

What is it? _____

	4	9	7	7	4	→ Finish
	8	9	4	5	7	
	6	6	4	9	9	
	7	8	8	8	6	
Start →	5	5	6	5	5	

What is a cube?

A cube is a three-dimensional shape that has equal width, height, and length measurements.

A cube has six square faces, all of which have sides of equal length and meet at right angles.

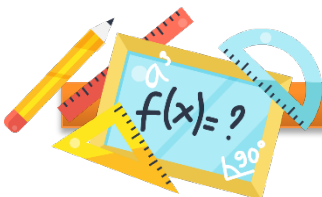
Finding the volume of a cube is a **snap** (something that can be done easily). All you need to do is:

- multiply the cube's length X width X height.



Tip 1. When you are asked to find the volume of a cube, you'll be given the length of one of the cube's sides. If you have this information, you have all you need.

Tip 2. If you are attempting to find the volume of a real-life object shaped like a cube, use a ruler or a tape measure to measure a side of the cube.





Look, read and complete.

What is the height of the cube? $s =$ _____

Now, cube this number by multiplying it by itself twice.

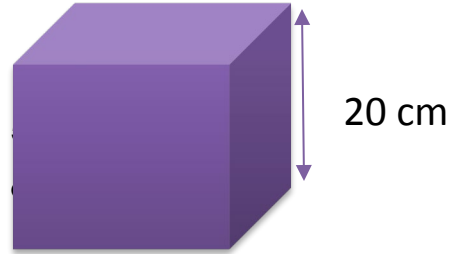
$$s \times s \times s = \text{ or } s^3 =$$

This simple process gives you the volume of a cube!!!

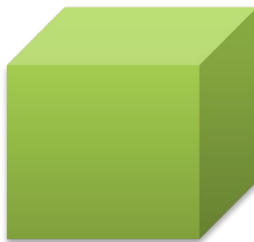
So the volume of the cube is _____.

Note! Remember that it is really important to label the answer using the same measurement unit. For example:

- If the original measurement unit was inches, use in.
- If the original measurement unit was centimetres, use cm.
- If the original measurement unit was meters, use m.

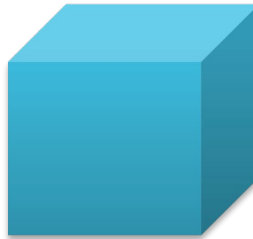


Look and calculate the volume of the cubes.



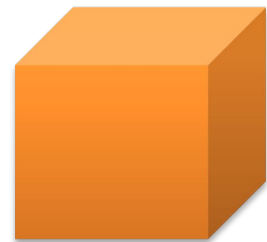
70 cm

.....



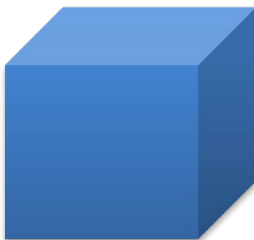
12 feet

.....



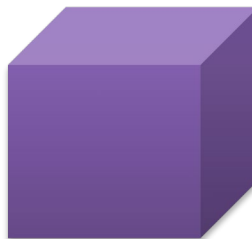
12.8 cm

.....



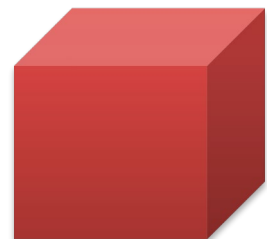
16 feet

.....



80 cm

.....



8.06 cm

.....





The volume of a pyramid

When you are asked to find the volume of a pyramid, you have to:

- find the product of the area of the base and the height.
- then multiply the result by $1/3$ or simply divide by 3.



Let's find out how to calculate the volume of a pyramid with a rectangular and a triangular base. Follow the steps.

Pyramid with a rectangular base

What is the length of the base? _____

What is the width? _____

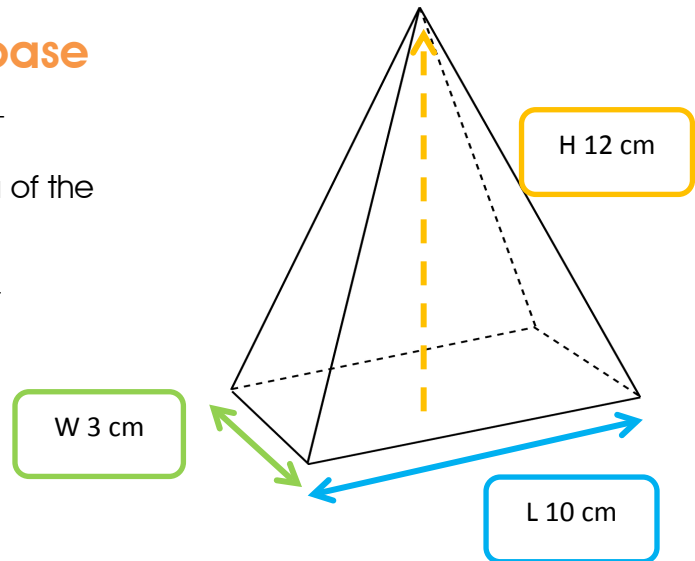
Multiply the length and width to find the area of the base.

The area of the base is _____

Multiply the area of the base by the height.

Divide the result by 3.

The result is 120 cm^3 . Yes ____ / No ____



Pyramid with a triangular base

Find the length and the width of the base.

What is the length of the base? _____

What is the width of the base? _____

Consider the values as the base and the height of the triangle.

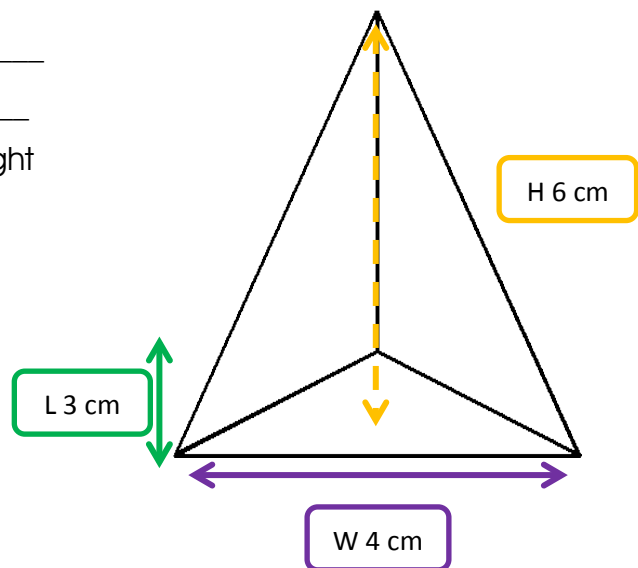
Calculate the area of the base like so:

$$A = \frac{1}{2} (b)(h)$$

$$A = \frac{1}{2} (4)(3)$$

$$A = \frac{1}{2} (12)$$

$$A = \text{_____ cm}^2$$





Now multiply the area of the base by the height of the pyramid. The area of the base is _____ cm^2 .
The height is _____ cm .

_____ $\text{cm}^2 \times 6 \text{ cm} =$ _____ cm^3 .

Divide the answer by 3.

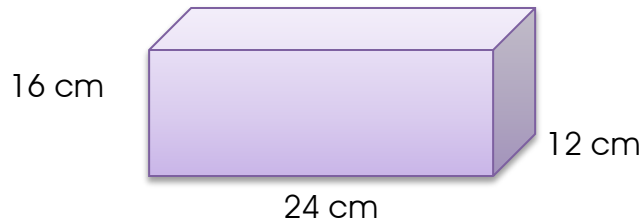
_____ $\text{cm}^3 / 3 = 12 \text{ cm}^3$. Yes _____ / No _____



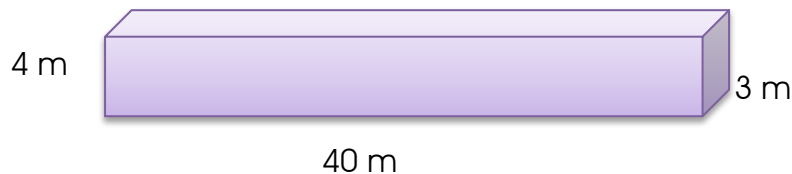
The process to calculate the volume of rectangular prisms is as easy as the ones for the cubes and pyramids. The only thing you have to do is follow the formula; it actually shows steps to follow.

Calculate the volume of rectangular prisms. This is the formula:

- **Volume = Length x Width x Height**



Answer: _____ cm^3



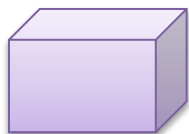
Answer: _____ m^3

Time to do some research!!!

Look around the classroom, walk around school or think of things which have the shapes.

Use a tape measure or a ruler to get information and calculate the volume of each.

My classroom



The process

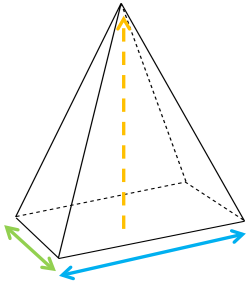




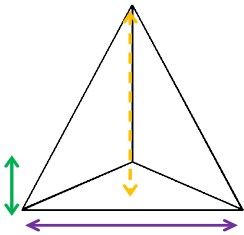
The process



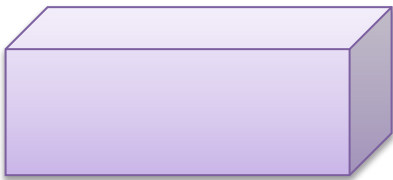
The process



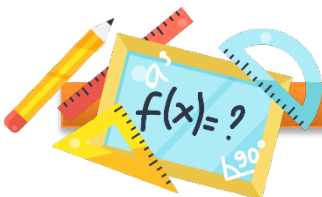
The process



The process



The process





You're up!

Talk to a friend and write the formulas to calculate the volume of all the shapes – this formula card is for you to study so make it simple and easy to remember.

Formulas to calculate the volume of shapes

Name	Formula	Shape and example
A cube by length of a side		
A pyramid with a rectangular base		
A pyramid with a triangular base		

Tips:

- _____
- _____
- _____
- _____
- _____





Proportions



TAKE THE CHALLENGE



Look at the chart and the fractions below.

Place the fractions in the squares so that each row and column has a sum of 1.

Two of the fractions have been added to get you started.

$$\frac{3}{8} \quad \frac{5}{16} \quad \frac{9}{16} \quad \frac{2}{8}$$

$$\frac{1}{2} \quad \frac{7}{16} \quad \frac{3}{16}$$



$\frac{1}{8}$		
	$\frac{1}{4}$	



Amazing math puzzles and mazes by Cindi Mitchell

What is proportion?

It is the number, amount or level of one thing when compared to another.

A proportion, on the other hand, is a true statement – it shows that two **ratios** are equal.

What is a ratio?

A ratio is a comparison of two numbers by division.

- Look at an example of a proportion. Then write two more examples.

$$\frac{6}{8} = \frac{12}{16}$$

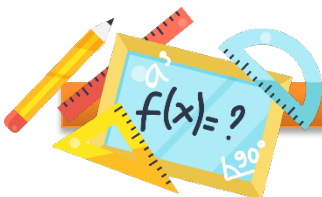
"Six is to eight as twelve is to sixteen."

$$\frac{\quad}{\quad} = \frac{\quad}{\quad}$$

"_____"

$$\frac{\quad}{\quad} = \frac{\quad}{\quad}$$

"_____"





If water is on sale - 2 litres for 3 dollars then the ratio 2 / 3 expresses the relationship between the _____ and the _____ of the water.

Since the ratio is constant, we can buy 4 litres for _____ dollars, 6 litres for _____ dollars, etc.

How do you compare ratios?

A ratio is a way of expressing the relative sizes of parts of a group. Ratios are used in different fields like baking or science. When two ratios are equivalent, they are in proportion. To find out if two ratios are in proportion, you have to work with the ratios as equivalent fractions. The aim is to make true statements about their values.

Try this!

Club 1: 6 to 4

Club 2: 39 to 26

Step 1. Find and circle the denominator of each ratio.

You can express the ratios in two ways:

- using a colon - $1 : 2$
- a fraction bar - $\frac{1}{2}$



Step 2. Find the LCM for the two denominators.

4: _____

26: _____, _____, _____, _____, _____, _____, _____, ...

Step 3. Write the equivalent fraction for the first ratio.

Divide the LCM by the denominator and multiply the numerator by this quotient.

- $52 \div 4 = 13$
 - $6 \times 13 = 78$
- So the new fraction becomes $\frac{78}{52}$



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Divide the LCM by the denominator and multiply the numerator by this quotient.

- $39 \times 2 = 78$

So the new fraction becomes

$$\frac{78}{52}$$

So, $\frac{6}{4} = \frac{39}{26}$ Yes: No:

- A man has a store in the city centre. On Saturday, he sold 10 cans of soda and 20 bottles of water. On Sunday, he sold 9 cans of soda and 12 bottles of water.

On Saturday _____ On Sunday _____ Neither, the ratios are equivalent. _____

The first day The second day Neither, the ratios are equivalent.





Martin's class _____ Monica's class _____ Neither, the ratios are equivalent. _____

15-year-olds _____ 16-year-olds _____ Neither, the ratios are equivalent. _____





Percent

What does **Percent** mean? _____

How can you express the following percents as fractions?

$25\% = \underline{\hspace{2cm}}$
 $83\% = \underline{\hspace{2cm}}$
 $60\% = \underline{\hspace{2cm}}$
 $95\% = \underline{\hspace{2cm}}$



A percent can also be regarded as ratio in which 100 represents the total number in the group. Look at the following example:

Thirty percent of the kids who participated in a festival were 10 years old. If 12 kids are 10 years old, how many kids were in the festival in all?

Create a ratio box – analyze how the information was organized.

	Percent	Actual Count
10 years old	30	12
Other ages		o
Total	100	†



What percent do you have to find? _____

What does the letter **o** stand for? _____

What does the letter **†** stand for? _____

Step 1	Step 2	Step 3	Step 4
$\frac{30}{100} = \frac{12}{\dagger}$	$30\dagger = 12 \times 100$	$\dagger = \frac{12 \times 100}{30}$	$\dagger = \frac{1200}{30} = 40$

$\dagger = 40$

A total of 40 kids were in the festival.





Example 2

In the Charleston Primary school there is an amazing orchestra. Last week, there was a national contest. Only 40 % of the orchestra members played in the event. If 24 members did not play, then how many did play?

	Percent	Actual Count
Played	40	p
Did not play	60	24
Total	100	t



$$\text{Step 1} \quad \frac{40}{60} = \frac{p}{24}$$

$$\text{Step 2} \quad 60p = 40 \times 24$$

$$\text{Step 3} \quad p = \frac{40 \times 24}{60}$$

$$\text{Step 4} \quad p = \frac{960}{60} = 16$$

$$p = 16$$

A total of 16 members played in the event.

Read and organize the information in the table. Then follow the whole process to find the answer.

Example 3

Sonia is going to give a speech for her literature class. She is a little bit concerned because her formal shoes are pretty old. Her mum noticed that and they have decided to go shopping for a new pair of shoes. They went to the Bright Plaza. Sonia's mum paid 60 % instead of 100%, so she saved 40% of the full price. You are given what Sonia's mum paid and you are asked what the full price was, which is the 100% price.

	Percent	Actual Count
Paid	60	\$ 45.60
Saved	40	s
Full price	100	t



$$\text{Step 1} \quad \frac{100}{60} = \frac{s}{45.60}$$

$$\text{Step 2} \quad 60t = 45.60 \times \frac{100}{60} = 4560$$

$$\text{Step 3} \quad t = \frac{4560}{60} = 76$$

$$t = 76$$

The full price for the new pair of shoes was \$76.





Forty percent of the new cameras are digital cameras. If 24 cameras will not be digital cameras, how many cameras will he have in the store in all?

Michael Dawson is a very famous baseball pitcher. This season he won 80% of the games he pitched. If he pitched 35 ballgames, how many games did he win?

A little girl earned a grade of 80% on a science test that had 20 questions. How many questions on this test did the girl answer correctly?



Sequences and series



TAKE THE CHALLENGE



Can you read people's minds?
Try this process with several friends.
Ask a friend to think of a number
between 1 and 20 and write it on the
line.

Friend 1. _____

Friend 4. _____

Friend 2. _____

Friend 5. _____

Friend 3. _____

Friend 6. _____

Then add 5 to it.

Next, multiply the result by 3.

After that, subtract 15 from the result.

Finally, divide the result by 3.

Did you get the same number?

Can you explain why you get the same number?

.....

.....

.....

Read the definitions and decide on which concept is being described.

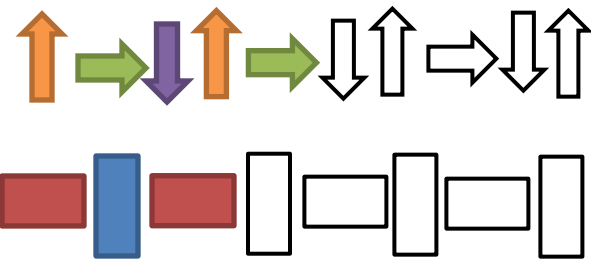
Do you know what patterns and sequences are?

a) - It is a series of related things or events, or the order in which they follow each other.

b) - It is any regularly repeated arrangement, especially a design made from repeated lines, shapes or colours on a surface.



Look and explain the pattern sequences.





Arithmetic sequences

Numbers can also be used to create interesting patterns.

Read and provide the information.

Arithmetic sequences are built by **adding** the same number each time.

Example 1

1, 4, 7, 10, 13, 16, 19, 22, 25, __, __, __, __, __, __, __, ...

The pattern is "add ____ each time."

Example 2

3, 8, 13, 18, 23, 28, 33, 38, __, __, __, __, __, __, __, ...

The pattern is "add ____ each time."



Read and choose the correct answer.

Why didn't you get the same numbers?

a) Because you followed a different pattern.

b) Because you did follow the pattern.

c) Because you started with a different number.

Read and write numbers.

Add six, then subtract three.

1, 7, 4, __, __, __, __, __, __, __, __, ...

Add five, then subtract two.

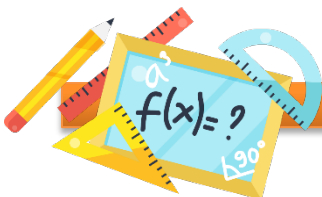
11, __, __, __, __, __, __, __, __, __, __, ...

Subtract seven, then add eight.

10, __, __, __, __, __, __, __, __, __, __, ...

Subtract three, then add four.

8, __, __, __, __, __, __, __, __, __, __, ...





Geometric sequences

Geometric sequences are built by multiplying the last factor by the same number each time.

Example 1

2, 4, 8, 16, 32, 64, 128, 256, _____, _____, _____, _____, _____, ...

The pattern is "multiply the last factor by _____ each time."

Example 2

3, 9, 27, 81, 243, 729, 2187, _____, _____, _____, _____, _____, ...

The pattern is "multiply the last factor by _____ each time."

Read and write numbers.

Pattern 3

5, _____, _____, _____, _____, _____, _____, _____, _____, ...

4, _____, _____, _____, _____, _____, _____, _____, _____, ...

6, _____, _____, _____, _____, _____, _____, _____, _____, ...

Multiply by 2, then subtract 3.

5, _____, _____, _____, _____, _____, _____, _____, _____, ...

Multiply by 5, then subtract 9.

3, _____, _____, _____, _____, _____, _____, _____, _____, ...

Multiply by 3, then add 8.

6, _____, _____, _____, _____, _____, _____, _____, _____, ...

Multiply by 4, then add 11.

7, _____, _____, _____, _____, _____, _____, _____, _____, ...

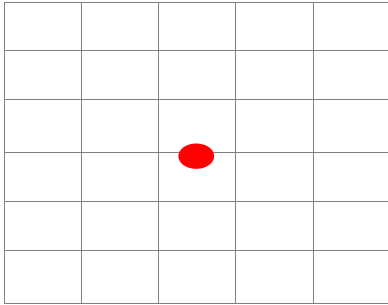




Special sequences - Triangular numbers

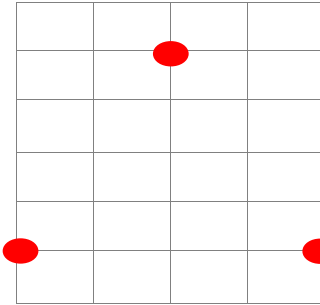
This sequence can be formed by using a pattern of dots which forms triangles. Look, read and think. Then draw dots and lines to show all the triangles in it.

1
Dot



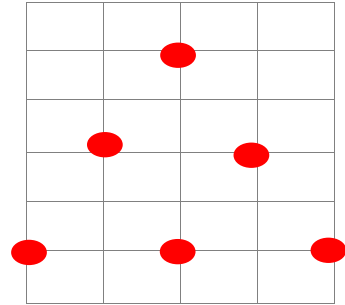
1

3
Dots



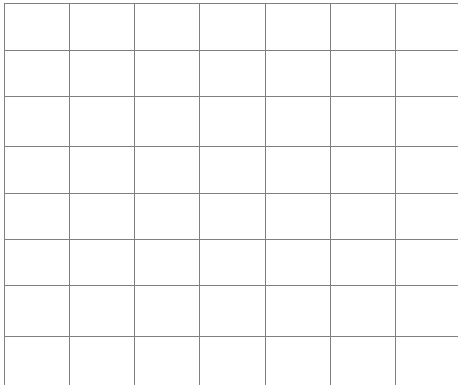
1 + 2 = 3

6
Dots

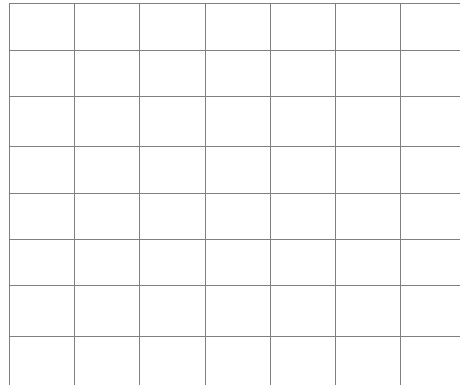


1 + 2 + 3 =

10
Dots



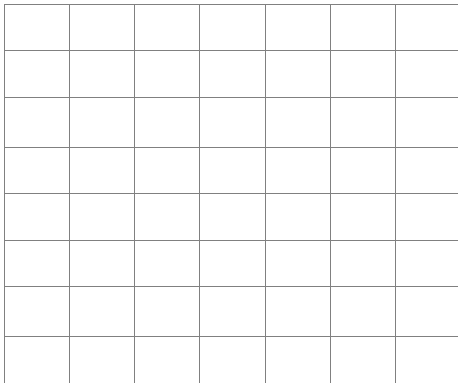
15
Dots



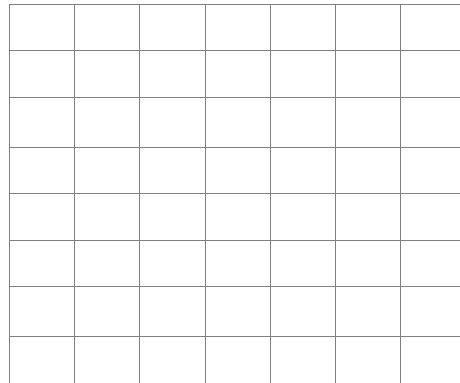
..... =

..... =

Dots

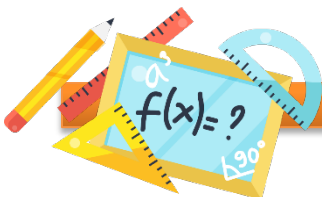


Dots



..... =

..... =

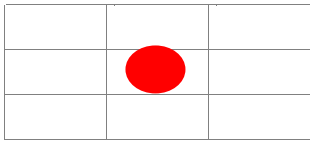




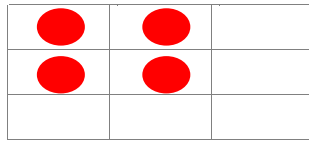
Special sequences - Square numbers

This sequence can be formed by multiplying a number by itself.

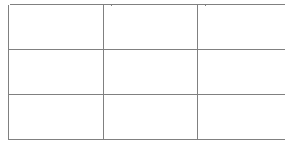
1
Dot



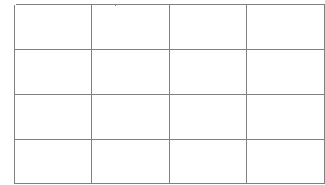
4
Dots



9
Dots



16
Dots



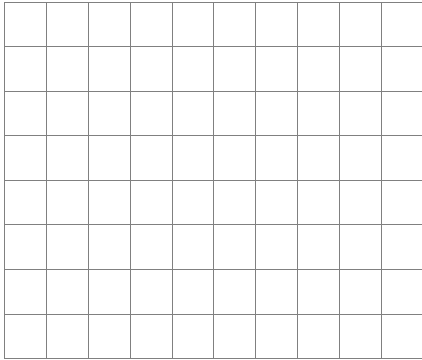
$$1^2 = 1 \times 1 = 1$$

$$2^2 = 2 \times 2 = 4$$

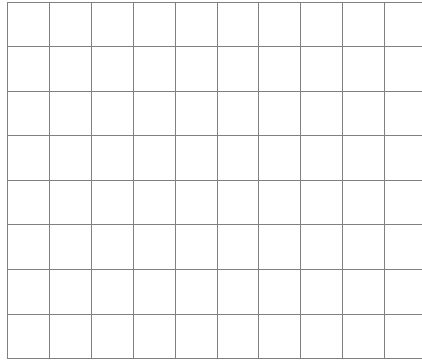
$$\dots = _ \times _ = _$$

$$\dots = _ \times _ = _$$

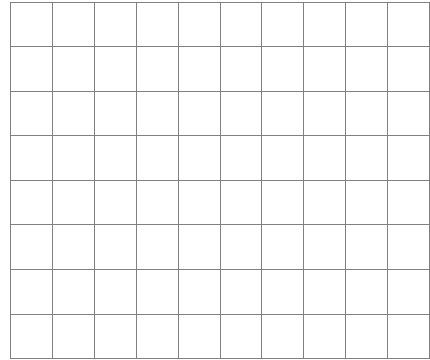
.....
Dots



.....
Dots



.....
Dots

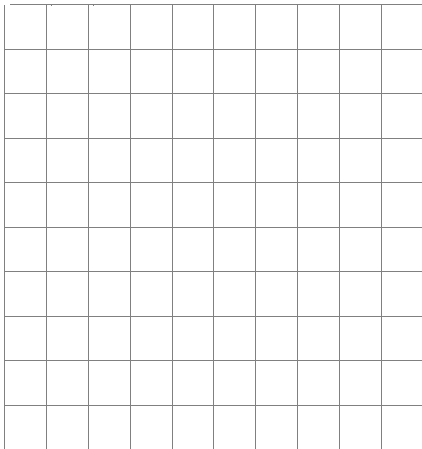


$$\dots = _ \times _ = _$$

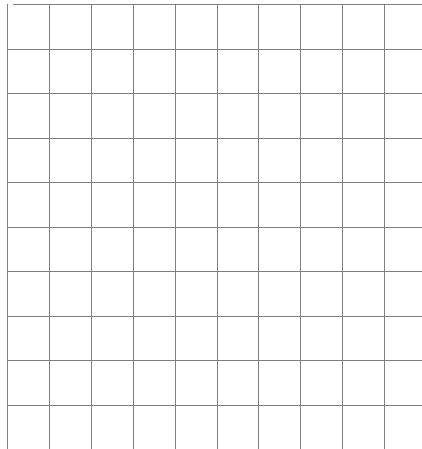
$$\dots = _ \times _ = _$$

$$\dots = _ \times _ = _$$

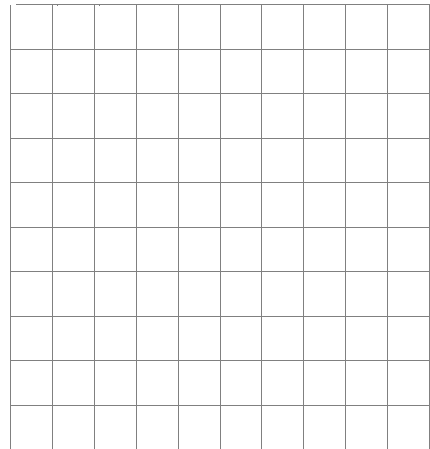
.....
Dots



.....
Dots



.....
Dots



$$\dots = _ \times _ = _$$

$$\dots = _ \times _ = _$$

$$\dots = _ \times _ = _$$





Special sequences - Cube numbers

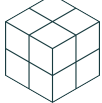
This sequence can be formed by cubing a number. It means that you must multiply a number by itself twice.

Look and draw lines to show that the numbers have been cubed.

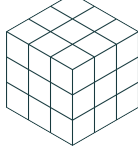
"Notice how the rows get arranged."



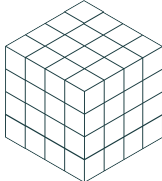
1 is the first cube number because $1 \times 1 \times 1 = 1$



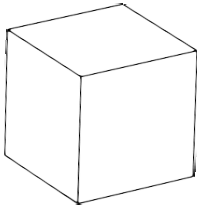
8 is the second cube number because $2 \times 2 \times 2 = 8$



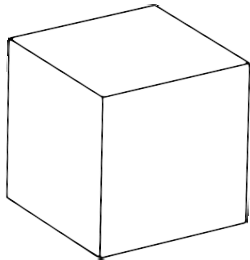
..... $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$



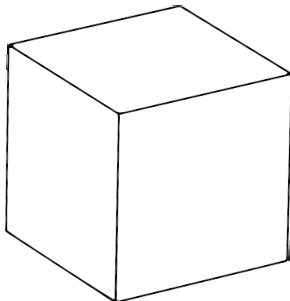
..... $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$



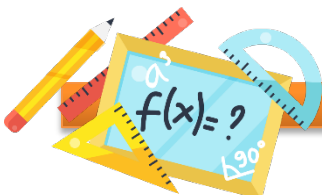
..... $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$



..... $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

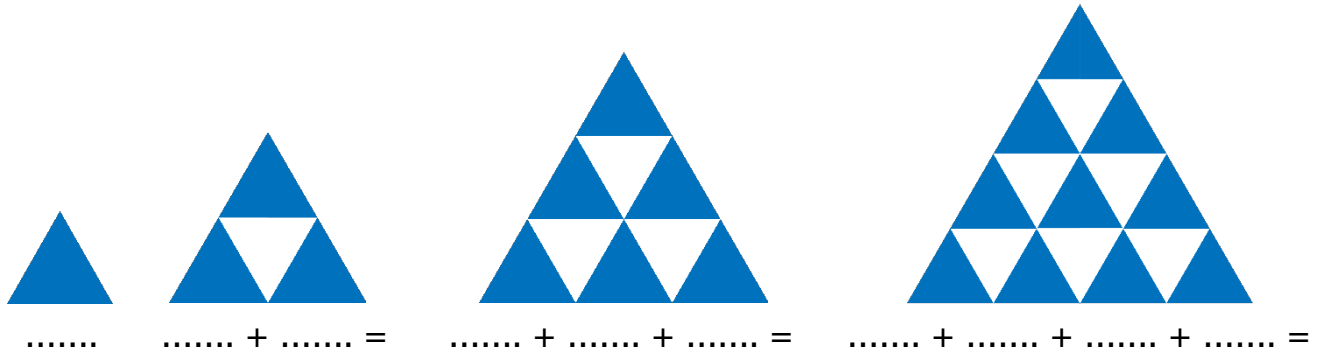


..... $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

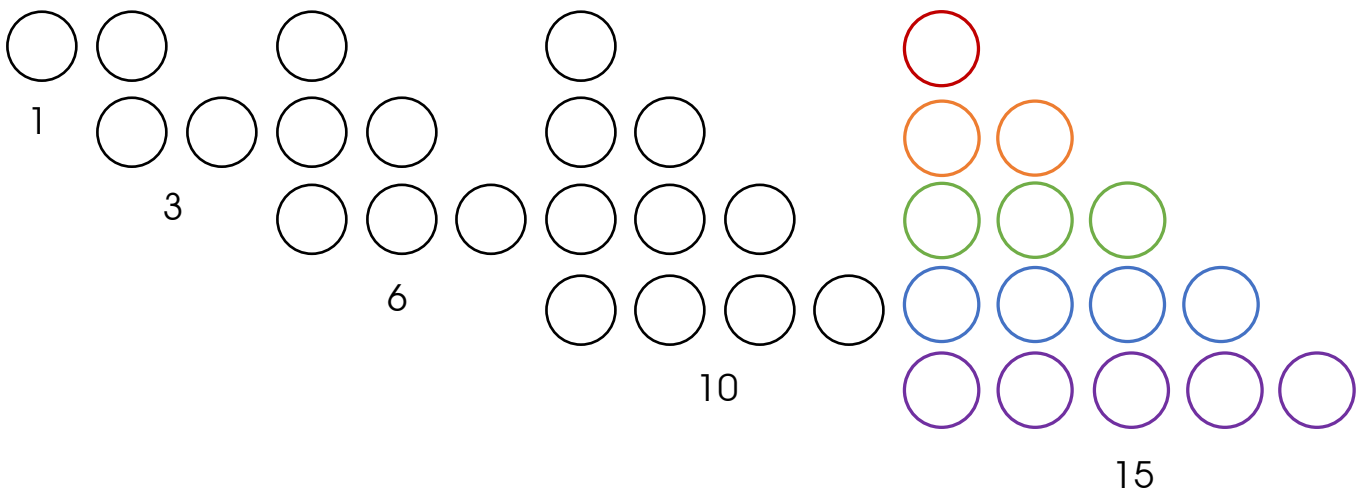


Look and think. How would you complete the boards?

What are the operations?



How would you colour the balls in sections 1 - 10?



How would you complete this number board?

1	1	1	1	1	1	1	1	1	1	1
1	2		4	5		7		9	10	
1	3	6		15	21		36	45		
1	4		20			84	120			
1	5			70		210				
1		21			252					
1			84	210						
1	8	36	120							
1		45								
1	10									
1										



Maths 4U



Congratulations

Certificate of achievement proudly presented to:

For having completed the **EnglisHouse Maths** course at **Sixth Grade**. For your effort and outstanding results, but most importantly, for smiling and for being you...

Such an amazing kid!

