دولة قطر

المجلس الأعلى للتعليم
SUPREME EDUCATION COUNCIL
هيئة التعليم

SCIENTIFIC ENGLISH

MATHEMATICS AND SCIENCE

GRADE 7

النشيد الوطني

قَسَمًا بِمَنْ رَفَعَ السَّمَـاءْ	قَسَمًا بِمَنْ نَشَرَ الضِّيَـاءْ
قَطَرٌ سَتَبْقَـى حُـرَّةً	تَسْمُو بِرُوحِ الأَوْفِيَـاءْ
سِيـرُوا عَلَـى نَهْـجِ الأُلَـى	وَعَلَى ضِيَاءِ الأَنْبِيَـاءْ
قَطَرٌ بِقَلْبِي سِيـرَةٌ عِـزٌّ	وَأَمْـجَادُ الإِبَاءْ
قَطَرُ الرِّجَـالُ الأَوَّلِينَ	حُمَاتُنَا يَوْمَ النِّـدَاءْ
وَحَمَائِـمٌ يَوْمَ السَّلَامْ	جَوَارِحٌ يَوْمَ الْفِـدَاءْ

لون علم دولة قطر العنابي والأبيض ، وتفصل بين اللونين تسعة رؤوس.

الأبيض : هو رمز السلام الذي يسعى له حكام قطر وأبناؤها.

العنابي : يرمز إلى الدماء المتخثرة، وهي دماء الشهداء من أبناء قطر الذين خاضوا معارك كثيرة في سبيل وحدة دولة قطر وخاصة في النصف الأخيرمن القرن التاسع عشر.

الرؤوس التسعة : ترمز إلى أن دولة قطر هي العضو التاسع في الإمارات المتصالحة من دول الخليج العربية.

علم دولة قطر

رؤية قطر الوطنية 2030

تهدف رؤيـة قطر الوطنية 2030 التي تمت المصادقة عليها بموجب القرار الأميري رقم 44 لسنة 2008، إلى تحويل قطـر بحلـول عام 2030 إلى دولة متقدمة قادرة على تحقيق التنمية المستدامة وعلى تأمين استمرار العيش الكريم لشعبها جيلا بعد جيل. حيث تحدد الرؤية الوطنيـة لدولة قطـر النتـائج التي يسعى البلد لتحقيقها على المدى الطويـل كما أنها تـوفـر إطارا عاما لتطوير إستراتيجيات وطنية شاملة وخطط تنفيذها.

وتستشرف الرؤية الوطنية الآفاق التنموية من خلال الركائز الأربع المترابطة التالية :

التنمية البشرية	التنمية الاجتماعية	التنمية الاقتصادية	التنمية البيئية

الركيزة الأولى ـ التنمية البشرية
الغايات المستهدفة :

سكان متعلمون :

- نظام تعليمي يرقى إلى مستوى الأنظمة التعليمية العالمية المتميزة ويزود المواطنين بما يفي بحاجاتهم وحاجات المجتمع القطري، ويتضمن:
  - مناهج تعليم وبرامج تدريب تستجيب لحاجات سوق العمل الحالية والمستقبلية.
  - فرصا تعليمية وتدريبية عالية الجودة تتناسب مع طموحات وقدرات كل فرد.
  - برامج تعليم مستمر مدى الحياة متاحة للجميع.

- شبكة وطنية للتعليم النظامي وغير النظامي تجهز الأطفال والشباب القطريين بالمهارات اللازمة والدافعية العالية للمساهمة في بناء مجتمعهم وتقدمه، تعمل على:
  - ترسيخ قيم وتقاليد المجتمع القطري والمحافظة على تراثه.
  - تشجيع النشء على الإبداع والابتكار وتنمية القدرات.
  - غرس روح الانتماء والمواطنة.
  - المشاركة في مجموعة واسعة من النشاطات الثقافية والرياضية

- مؤسسات تعليمية متطورة ومستقلة تدار بكفاءة وبشكل ذاتي ووفق إرشادات مركزية وتخضع لنظام المساءلة.
- نظام فعال لتمويل البحث العلمي يقوم على مبدأ الشراكة بين القطاعين العام والخاص بالتعاون مع الهيئات الدولية المختصة ومراكز البحوث العالمية المرموقة.
- دور فاعل دوليا في مجالات النشاط الثقافي والفكري والبحث العلمي.
- استقطاب التوليفة المرغوبة من العمالة الوافدة ورعاية حقوقها وتأمين سلامتها، والحفاظ على أصحاب المهارات المتميزة منها.

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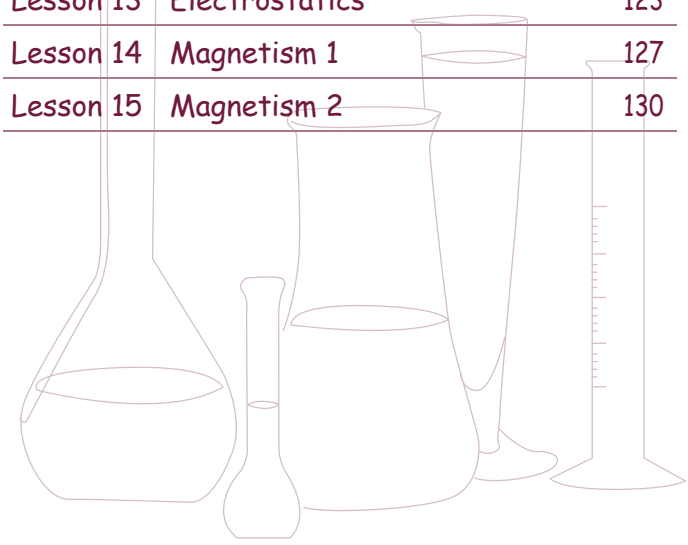


SCIENTIFIC ENGLISH

MATHEMATICS

GRADE 7

GRADE 6 REVIEW

Task 1: CAN YOU REMEMBER THE KEYWORDS FROM GRADE 6?

Write the correct keyword for each definition from the box below.

function sequence equivalent fraction ascending
algebraic expression variable common factor decimal
prime number highest common factor

	KEYWORD	MEANING	PICTURE or EXAMPLE
1		A symbol for a number we do not know.	n + 3
2		A math statement that consists of arithmetic numbers, letters, (used as symbols) and operation signs (+, - x)	x + 6
3		This has an input and an output and the output is related by a number operation.	input 2 output 4 2 is the operation.
4		A list of numbers in order using a number rule.	3, 6, 9, 12, 15..... +3 is the rule.
5		This has exactly only two factors, itself and one.	3,5,7,11,.....

	KEYWORD	MEANING	PICTURE or EXAMPLE
6		A number that can be divided into more than one number.	8 = { 1, 2, 4, 8 } 12 = { 1, 2, 3, 4, 6, 12,}
7		A fraction that is the same as another but uses different numbers.	$\frac{1}{2} = \frac{2}{4}$
8		A number that has a whole number and a fraction part.	56.4
9		The highest number that divides exactly into two or more numbers.	12 = { 1, 2, 3, 4, 6, 12} 18 ={ 1, 2, 3, 6, 9, 18}
10		Arranging numbers from smallest to largest.	0, 2, 4, 6, 8, 10, ...

Task 2: MATCHING

Help us draw lines to match the words with their correct meaning or picture.

1. equation
2. denominator
3. order of operations
4. percent
5. fraction
6. venn diagram
7. function table
8. quotient
9. term
10. numerator

a) $4\overline{)64}$ 16

b) → $\frac{3}{5}$ How many

c)

x	2	1	0	-1
y	6	3	0	-3

d) $\frac{4}{5}$

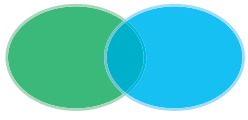
e) 7d

f) $\frac{20}{100} = 20\%$

g) $4b + 3 = 11$

h) E,D,M,A,S.

i) $\frac{3}{8}$ ↙ How many parts

j) 

Task 3: MULTIPLE CHOICE!

Complete the sentences. Choose a, b, or c.

1. Algebra is the area in math where ..... are represented by letters.

   a) additions **b)** numbers **c)** equations

2. An ..... is a statement that shows what is on the left of the equals sign is the same as what is on the right of the equals sign.

   a) expression **b)** equivalent fraction **c)** equation

3. A ..... is a list of numbers in order.

   a) sequence **b)** set **c)** factor

4. A .....-..... has a whole number and a fraction combined.

   a) fraction number **b)** decimal number **c)** mixed-number

5. A ..... number has more than two factors.

   a) fraction **b)** mixed **c)** composite

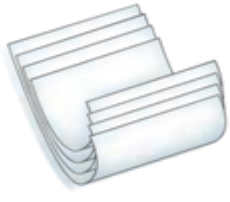
Task 4: FOLDABLES

Make this foldable to help you organize your grade 6 review words.

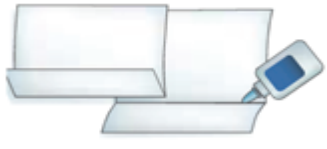
Begin with 4 sheets of A4 paper.

1. **Stack** 4 sheets of paper as shown.

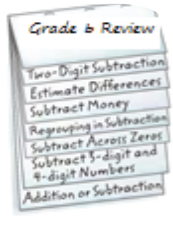
2. **Fold** upward so all layers are the same distance apart.



3. **Crease** well. Open and glue toghether as shown.

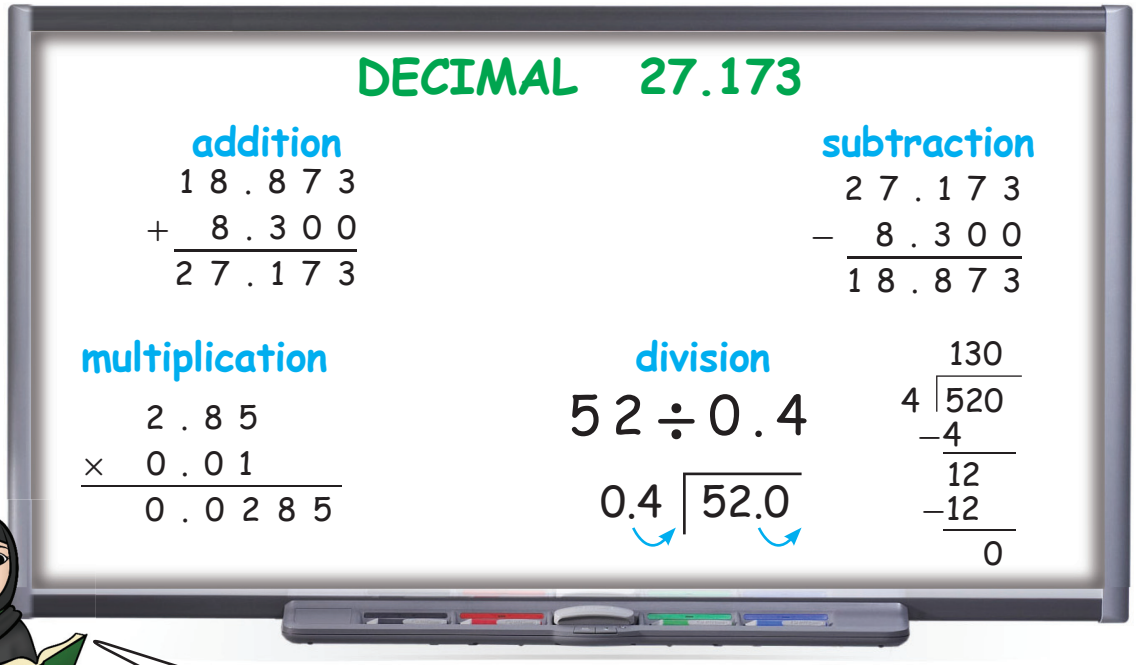


4. **Label** each page with a word. Then, write the meaning or draw a picture.



OPERATIONS WITH DECIMALS

KEYWORDS: decimal, addition, subtraction, multiplication, dividend, divisor, quotient



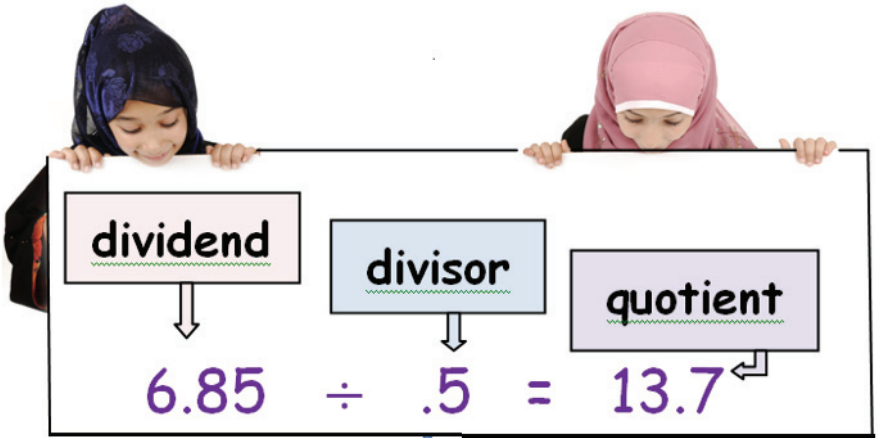
Good morning, students. Today's lesson is about operations with decimals. Sheikha, please remind us what a decimal is.

Yes, Mrs. Aisha. A **decimal** is a number that uses a decimal point followed by digits that show values less than one. I think Maha can tell us more.

Thank you, Sheikha. You know, **addition** and **subtraction** are really easy. You just line up the decimals. In multiplication, the product must have the same number of decimal places as those in the factors. But division is different.

Yes, Maha, **division** is different. To divide decimals you have to move the decimal point of the divisor and dividend the same number of places to the right. Then, you divide as usual.

The **quotient** is the answer in a division problem. Look at our poster.



Well done, Huda. I'm sure you all remember that the **dividend** is the amount you want to divide up, and the **divisor** is the number you divide by.

Task 1: **Draw lines to match each keyword to the correct example or definition.**

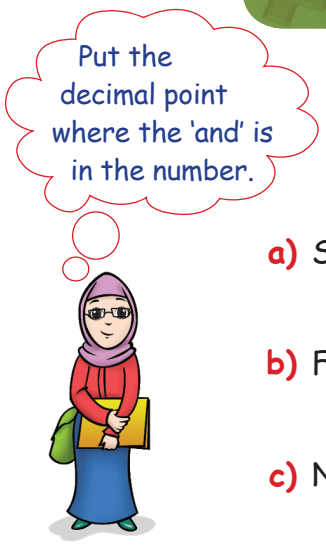
$\begin{array}{r} 27.173 \\ -\ 8.300 \\ \hline 18.873 \end{array}$	decimal	27.173
$52 \div \underline{0.4} = 130$ $\begin{array}{r} 130 \\ 0.4 \overline{)\ 52.0} \end{array}$	addition	$\begin{array}{r} 18.873 \\ +\ 8.300 \\ \hline 27.173 \end{array}$
$52 \div 0.4$ $0.4 \overline{)\ 52.0}$ $\begin{array}{r} 130 \\ 4 \overline{)\ 520} \\ -4 \\ \hline 12 \\ -12 \\ \hline 0 \end{array}$	subtraction	$52 \div 0.4 = \mathbf{130}$ $\begin{array}{r} \mathbf{130} \\ 0.4 \overline{)\ 52.0} \end{array}$
$\underline{52} \div 0.4 = 130$ $\begin{array}{r} 130 \\ 0.4 \overline{)\ 52.0} \end{array}$	division	$\begin{array}{r} 2.85 \\ \times\ 0.01 \\ \hline 0.0285 \end{array}$

divisor

dividend

quotient

multiplication



Task 2: **Read each number. Then write it in standard form.**

a) Seven and thirty-five hundredths. .....

b) Four and twenty-three hundredths. .....

c) Nine and fifty-six hundredths. .....

d) Eight and seventy-two hundredths. .....

e) Six and seven tenths. .....

f) Five and eight tenths. .....

Task 3:

Match each group of words to its corresponding number.

1	Four is in the hundredths place.	a)	17.08
2	Zero is in the tenths place.	b)	28.14
3	Five is in the hundredths place.	c)	521.59
4	Three is in the ones place.	d)	934.25
5	Two is in the tenths place.	e)	103.46
6	Nine in the hundredths place.	f)	621.95

TODAY'S MATHEMATICS KEYWORDS

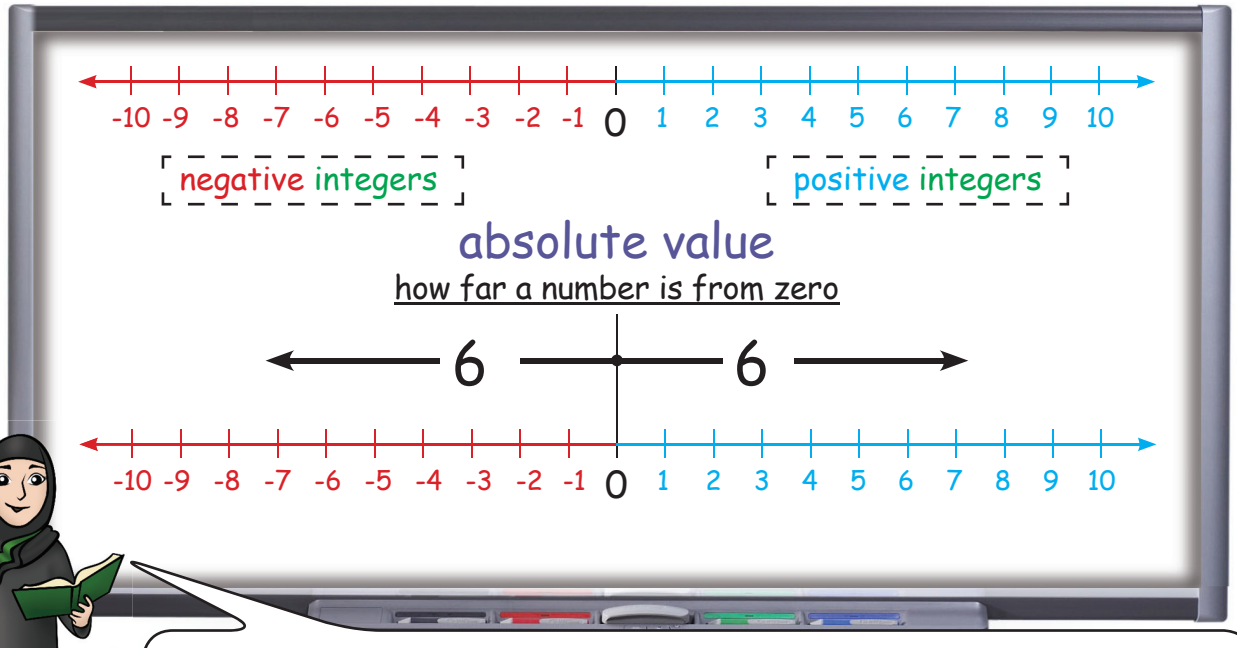
Complete the table. Fill in all blanks in all columns: keywords, meaning, picture or example.

KEYWORD	MEANING	PICTURE or EXAMPLE
addition of decimals	Write the numbers with the decimal points lined up, then add as usual.	
subtraction of decimals		$\begin{array}{r} 56.00 \\ -\ 19.46 \\ \hline 36.56 \end{array}$
	Move the decimal points on both until you are dividing by a whole number as usual.	$4\overline{)84.4}$
multiplication	Multiply without decimal points and add them in after.	
dividend		$4\overline{)3.28}$ $\quad 0.82$
	The number that you divide by.	$5\overline{)24.5}$ $\quad 4.9$
quotient	This is the answer in a division problem.	

INTEGERS

KEYWORDS: integer positive integer negative integer absolute value comparing integers ordering integers descending ascending

Today, Mrs. Aisha is teaching the class about **integers**.
Read and listen to the lesson. Then, do the activities.



Good morning, class. Today, we are studying **integers**, which are whole numbers with no fractional part.
Integers that are greater than 0 are **positive integers** (+), and integers that are less than 0 are **negative integers** (-).

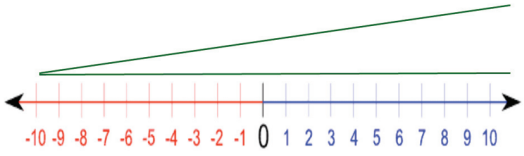
Absolute value is how far a number is from zero. It does not matter if it is a negative or a positive number. The absolute value is always positive.
This symbol "|" is placed on both sides of the integer to mean absolute value.
We write |-6| = 6, which means the absolute value of negative six is 6.

So if a value is negative four or positive four, its absolute value will always be positive four. Is that right Mrs Aisha?

Yes, it is Maha.

compare integers

Which is larger? 7 or 5? -5 or -7?



Review Symbols for comparing Integers:

- $<$ (is less than)
- $\leq$ (is less than **or** equal to)
- $>$ (is greater than)
- $\geq$ (is greater than **or** equal to)
- $=$ (is equal to)
- $\neq$ (is not equal to)

order integers

Ascending Order

-10 -3 4 7 27

descending order

27 7 4 -3 -10

When we **compare integers**, we decide which is larger.
We always read numbers from left to right.
Who can read these two number sentences?

$-4 < 2$ and $-4 > -8$

I can! We say "negative four is less than 2" and "negative four is greater than negative eight."

Can you arrange these integers in ascending order?

32 -5 12 -2 6

Yes! **Ascending** order gets larger and larger.
So the order would be: -5 -2 6 12 32
Descending order gets smaller and smaller.
The same integers in descending order would be: 32 12 6 -2 -5

Task 1: **Draw lines to match the words with their correct symbols.**

1 positive integer	a) >
2 negative integer	b) <
3 absolute value	c) 5, 3, 0, -2, -12,
4 ascending order	d) =
5 descending order	e) -6, -1, 2, 4, 5,
6 greater than	f) -14
7 equals to	g) | -8 |
8 less than	h) 37 or +37

Task 2: **ACTIVITY**

Write 5 positive integers in this box.

Write 5 negative integers in this box.

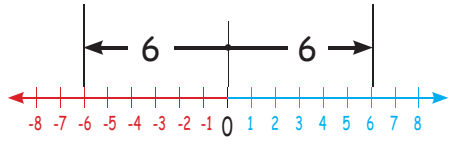
Now can you put the integers in ascending and descending orders ?

Ascending: _____

Descending: _____

TODAY'S MATHEMATICS KEYWORDS

Complete the table. Fill in all blanks in all columns: keywords, meaning, picture or example.

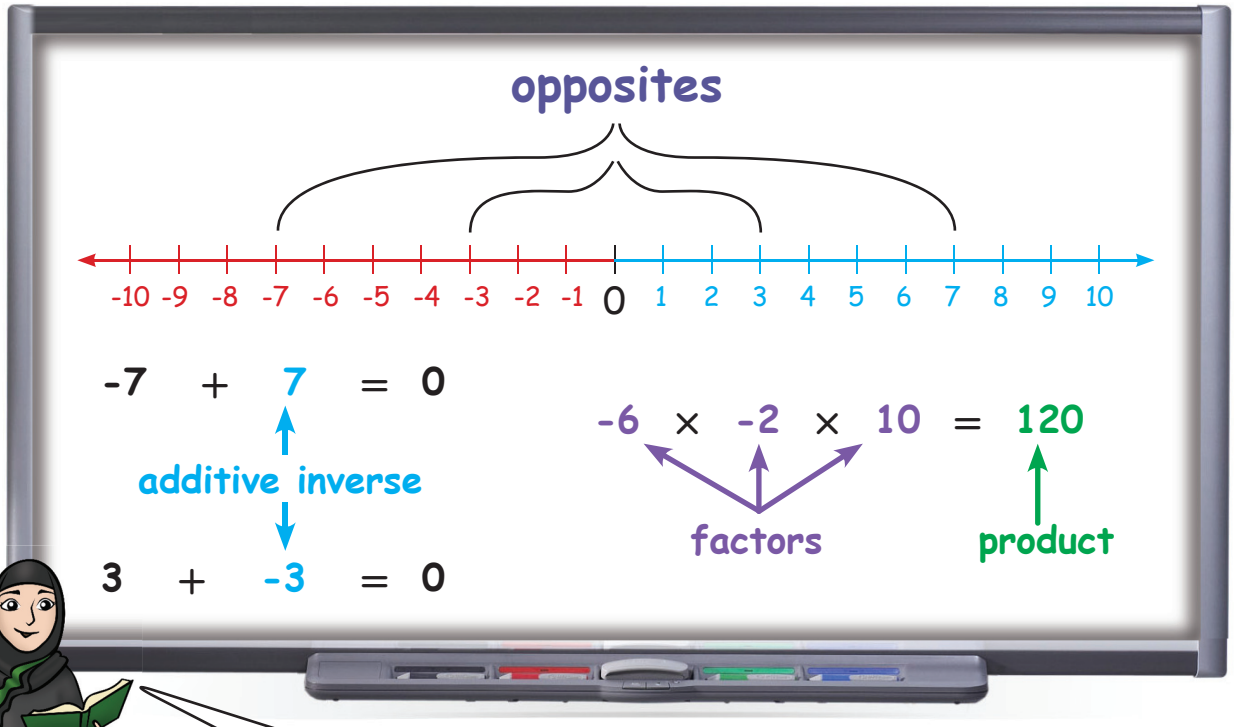
KEYWORD	MEANING	PICTURE or EXAMPLE
	A whole number that has no fractional part.	
positive integer		
negative integer	A whole number less than 0.	
	How far a number is from zero. |-6| = 6 |6| = 6	

KEYWORD	MEANING	PICTURE or EXAMPLE
comparing integers		$7 > 4$ $-3 < -1$
ordering integers	We can order them as they are on the number line.	
	Order integers from greatest to smallest.	2, 1, 0, -1, -2, -3
ascending		-3, -2, 0, 3, 4, 6

OPERATIONS WITH INTEGERS

KEYWORDS: opposites additive inverse factor product

Today, Mrs. Aisha is teaching the class about **integers**.
Read and listen to the lesson. Then, do the activities.



Good morning, class. Today, we are studying integers. We know that every integer has an **opposite**. What is the opposite of negative three, Maha?

It is positive three, Mrs. Aisha, and the opposite of negative seven is positive seven. **Opposites** are the same distance from zero in different directions. They have the same absolute value.

If you add opposites together you will always get zero! That's why the opposite number is called the **additive inverse**. Negative seven plus its additive inverse, positive seven, equals zero.

Multiplying integers is not hard. We just need to remember that **factors** are the integers you multiply together to get the **product**, which is the answer in multiplication.

Task 1:

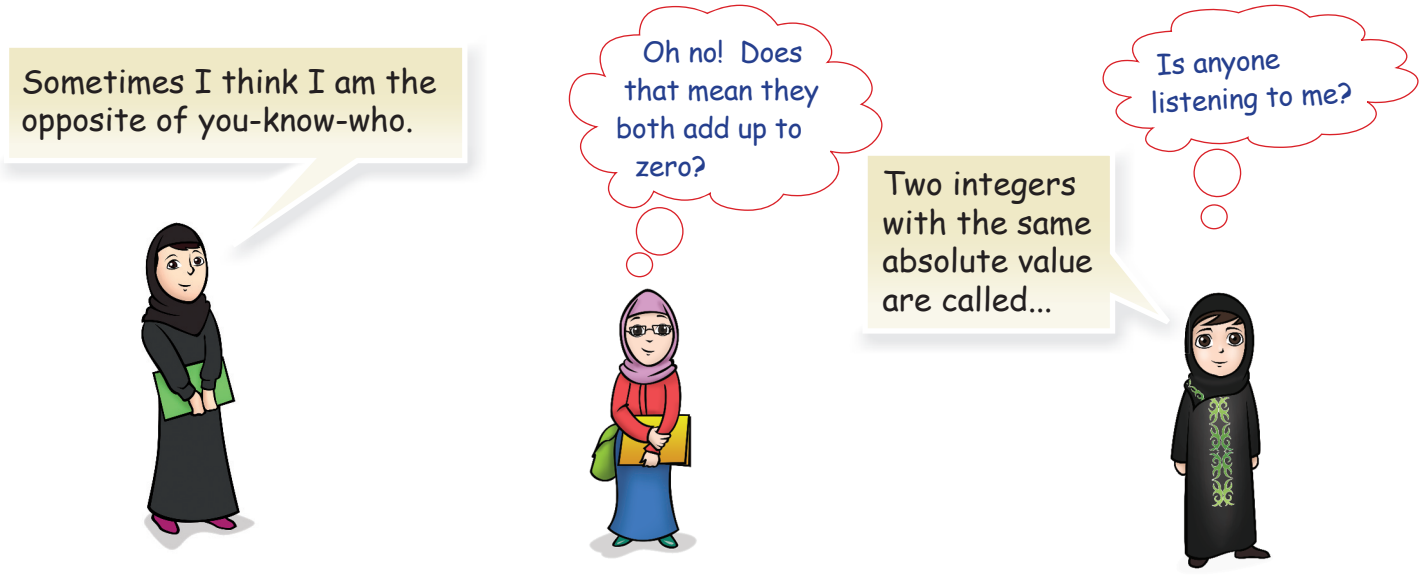
Use the words in the box below to fill in the missing words from each sentence.

factors	positive	negative	opposites
additive inverse	zero	integer	product

1. Negative six is the ..... of six.
2. Two integers with the same absolute value are called ..... .
3. We multiply two or more ..... to find a ..... .
4. When we add ..... three plus ..... three, we get ..... .
5. Every ..... has an opposite.

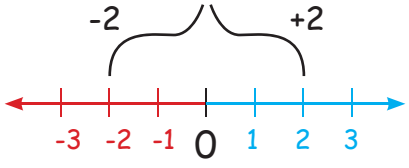
Task 2: Let's TALK!

Read each of the sentences in Task 1 to a partner.



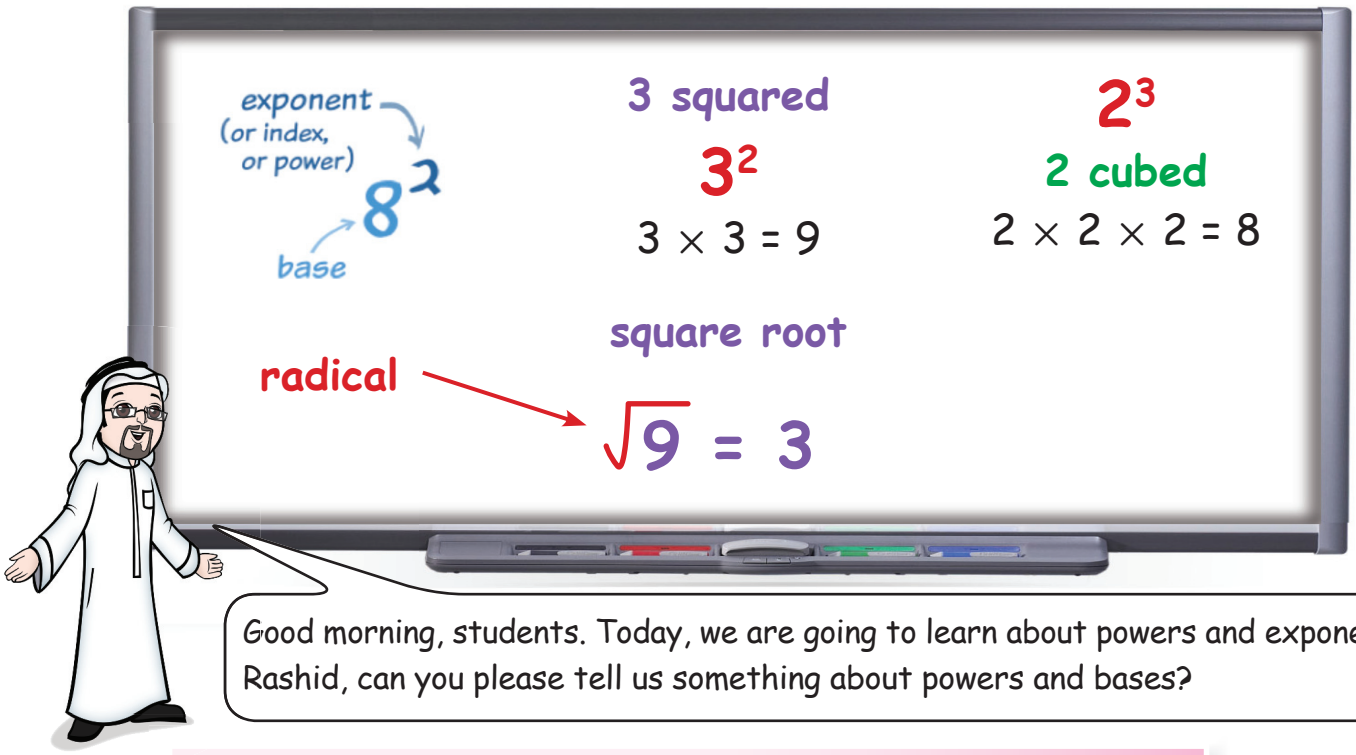
TODAY'S MATHEMATICS KEYWORDS

Complete the table. Fill in all blanks in all columns: keywords, meaning, picture or example.

KEYWORD	MEANING	PICTURE or EXAMPLE
	Integers that are the same distance from zero but in opposite directions.	
additive inverse		+3 + -3 = 0 -4 + +4 = 0
factor	One of the numbers that are multiplied together to get a product.	
	The answer to a multiplication problem.	+2 x -3 = -6

POWERS AND EXPONENTS

KEYWORDS: exponent, index, power, base, squared, cubed, radical sign √, square root



Good morning, students. Today, we are going to learn about powers and exponents. Rashid, can you please tell us something about powers and bases?

Yes, Mr. Omar. The **base** is the number that we use as a factor. The **exponent** tells us how many times to use the base as a factor. **Exponent**, **index** and **power** all mean exactly the same thing.

Look at the 8^2 on the board. The 8 is the **base** and 2 is the **index**. We use 8 as a factor two times, 8 x 8, to get 64. We can say 8 to the **power** 2 or 8 **squared**.

Squared means to use the base as a factor two times, and **cubed** means to use the base as a factor 3 times. So, 3^2 is 3 x 3, which we know is 9, and 2^3 means 2 x 2 x 2, which is 8.

Well done, class. The **square root** is the number used as a factor two times to give the number inside the radical. The square root of 9 is 3 because 3 x 3 = 9. We use the **radical sign** (√) to mean the root of a number.

Task 1: MATCHING.

Draw lines to match each keyword with its definition.

1 power	a) is using the base as a factor 3 times.
2 squared	b) is the symbol for the radical.
3 $\surd$	c) is how many times the base is used as a factor.
4 cubed	d) is the number we use as a factor.
5 base	e) is using the base as a factor 2 times.

Task 2: MULTIPLE CHOICE!

Choose a, b, c or d to complete each sentence.

1 The number that we use as a factor is called the ..... .

a) index b) base c) exponent d) radical sign

2 The ..... is the number used as a factor two times to give the number inside a radical sign.

a) index b) cubed c) square root d) radical sign

3 Another word for power or exponent is ..... .

a) index b) cubed c) base d) radical sign

4 We use the ..... to indicate the root of a number.

a) index b) base c) square root d) radical sign

5 The ..... tells us how many times to use the base as a factor.

a) exponent b) base c) square root d) radical sign

Task 3: **Use the keywords in the box below to complete each sentence**

exponent	power	base	squared	cubed
radical (√)		square root		

1. 2^3 means 2 ..... . 2 is the ..... and 3 is the ..... .
2. Since $4^2 = 16$, the ..... of 16 is 4.
3. When we see 6^2 we can say 6 to the ..... of 2 or we can say 6 ..... .
4. A ..... sign is used to indicate a root of a number.

Task 4: **LET'S TALK!**

Ask your partner these questions and listen to the answers.

What's the word for using the base as a factor 3 times?

What's the word for using the base as a factor two times?

What tells us how many times to use the base as a factor?

What do we call the sign that shows the square root?

TODAY'S MATHEMATICS KEYWORDS

Complete the table. Match the keywords listed below with either the meaning or picture/example. Fill in all blanks in all columns: keywords, meaning, picture or example.

base power square root exponent

KEYWORD	MEANING	PICTURE or EXAMPLE
exponent	How many times to use the base as a factor.	
square root		$\sqrt{9} = 3$ [3x3=9]
	Another name for an exponent. How many times to use the base as a factor.	
	The number that we multiply by itself.	3^2 base 3x3

TODAY'S MATHEMATICS KEYWORDS

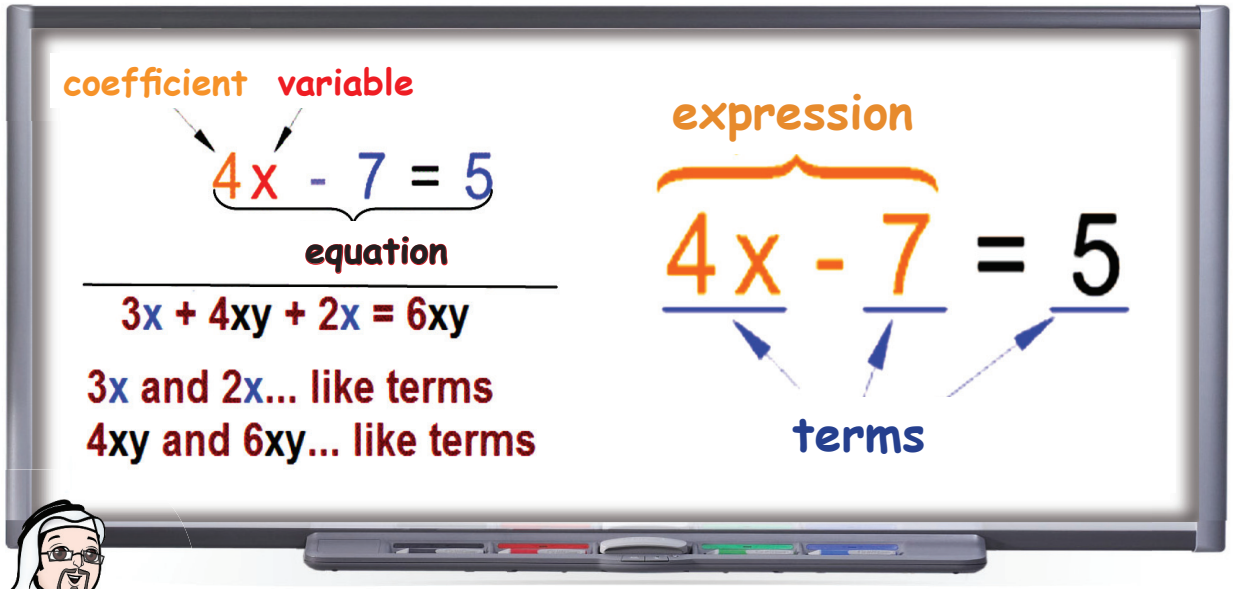
Complete the table. Match the keywords listed below with either the meaning or picture/example. Fill in all blanks in all columns: keywords, meaning, picture or example.

squared index radical sign cubed

KEYWORD	MEANING	PICTURE or EXAMPLE
cubed		$2^3 = 2x2x2$ 2 cubed
	The symbol to find the square root of a number, which is its base number.	$\sqrt{}$
index		4^2 Index
squared	Use the base as a factor two times. The exponent is 2.	

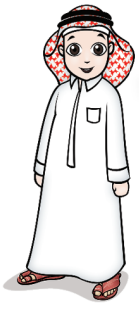
VARIABLES AND ALGEBRAIC EXPRESSIONS

KEYWORDS: variable expression equation like terms coefficient term



Today, we are going to look at words we use in algebraic expressions.
Look at the board: What do you see?

A **variable** is a letter that takes the place of a number.
An **expression** has numbers, variables and operation signs (+,-).
The **coefficient** is the number we use to multiply a variable.



An **equation** is a maths sentence with an 'equal' (=) sign.
Terms are letters and numbers separated by + and – signs.
Like terms have exactly the same variable.

Task 1: MATCHING

Draw lines to complete each sentence.

1 An expression	a) is a maths sentence with an = sign.
2 An equation	b) are separated by + or – signs.
3 A variable	c) has variables, operation signs and numbers.
4 Terms	d) is the number that multiplies the variable.
5 The coefficient	e) can be a letter that takes the place of a number.

Task 2: MULTIPLE CHOICE!

Choose the correct answer. Is it a, b or c?

1 In 4a + 3b – 2a, 4, 3 and 2 are ..... .

a) terms b) variables c) coefficients

2 In 4a + 3b – 2a, a and b are ..... .

a) terms b) variables c) coefficients

3 In 4a + 3b – 2a, 4a and 2a are ..... .

a) like terms b) expressions c) coefficients

4 4a + 3b – 2a is a/an ..... .

a) expression b) variable c) term

5 4a + 3b – 2a = 15 is a/an ..... .

a) term b) expression c) equation

Task 3: PUZZLE TIME!

Across

4) An ..... has variables, operation signs and numbers.

5) A variable can be a ..... that takes the place of a number.

Down

1) ..... have the same variable. (2 words)

2) The ..... is the number that multiplies the variable.

3) ..... are separated by + or – signs.

4) An ..... is a maths sentence with an = sign.

Task 4: MATCHING

Match the example to the keyword.

1 5a + 3b = 2c	a) like terms
2 4y + 3	b) equation
3 4x and 3x	c) expression

Task 5:

For each term, find the coefficient and variable. Then find the operation sign. Write them on the lines. Check your work with a partner.

$$4n + 7m$$

coefficient ..... , ... variable ..... , ... operation sign .....

Task 6:

Play this game with your partner. Don't forget to take turns.

I am a maths sentence with an 'equal' sign. What am I?

I am the number you use to multiply a variable. What am I?

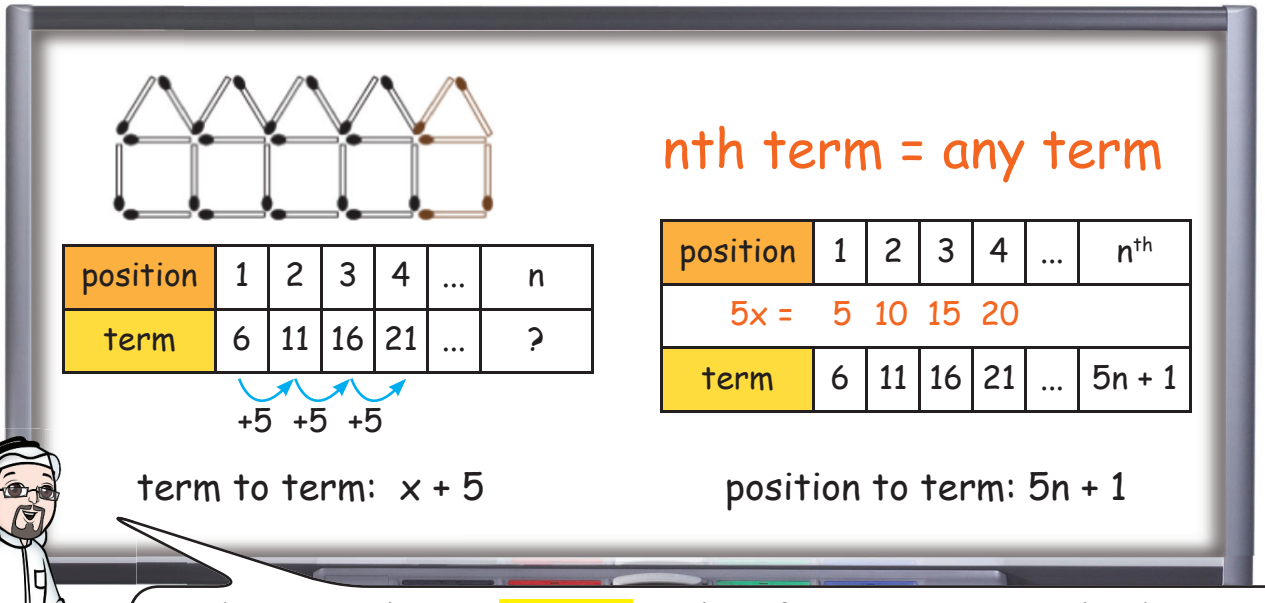
I have exactly the same variable. What am I?

I am a letter that takes the place of a number. What am I?

SEQUENCES

KEYWORDS: **term** **sequence** **term-to-term** **position-to-term** **nth term**

Today's lesson is about **sequences**.
Read and listen to the lesson. Then, do the activities.



Good morning, class. A **sequence** is a list of numbers in a special order. We built matchstick houses to create a sequence. The first house took 6 sticks, the second five more sticks – that's 11, and the row of 3 houses took 16 sticks. Rashid, can you tell us something about the sequence 6, 11, 16, 21?

Yes, Mr. Omar! The numbers in a sequence are called **terms**. When we look at our sequence on the board, we can see that there is a **term-to-term** pattern. The pattern is plus five. We can find the next term by adding five to the one before it.

But what if we want a rule that will give us any number in the sequence? What do we do when you ask us for the 20th term, Mr. Omar?

I might ask you for any term, that's what we call the **nth term**. Khalid, can you answer Mohammed's question?

Yes, Mr. Omar. Mohammed, you can make a rule for any term by finding the **position-to-term** pattern. In the case on the board we would multiply the position by 5 and add 1 to get the **nth term**.

Well done, class. Now let's do some activities to help us remember these keywords.

Task 1: MATCHING.

Draw lines to match the keywords to the example or definition.

1. sequence
2. term
3. term-to-term
4. position-to-term
5. nth term

a) 6, 11, 16, 21, 26...

b)

6	11	16	21

+5 +5 +5

c) 6, 11, 16, 21, 26...

d) any term

e) $5n + 1$

Task 2: MULTIPLE CHOICE!

Choose a, b, c or d to complete each sentence.

1. We can find the nth term by using the ..... rule.

   a) sequence **b)** nth term **c)** term-to-term **d)** position-to-term

2. The ..... means any term in the sequence.

   a) nth term **b)** term-to-term **c)** position-to-term **d)** term

3. Finding the pattern of difference between terms is called the ..... rule.

   a) term-to-term **b)** position-to-term **c)** term **d)** sequence

4. A/an ..... is a list of numbers in a special order.

   a) position-to-term **b)** term **c)** sequence **d)** nth term

5. A/an ..... is any number in the sequence.

   a) sequence **b)** term-to-term **c)** nth term **d)** term

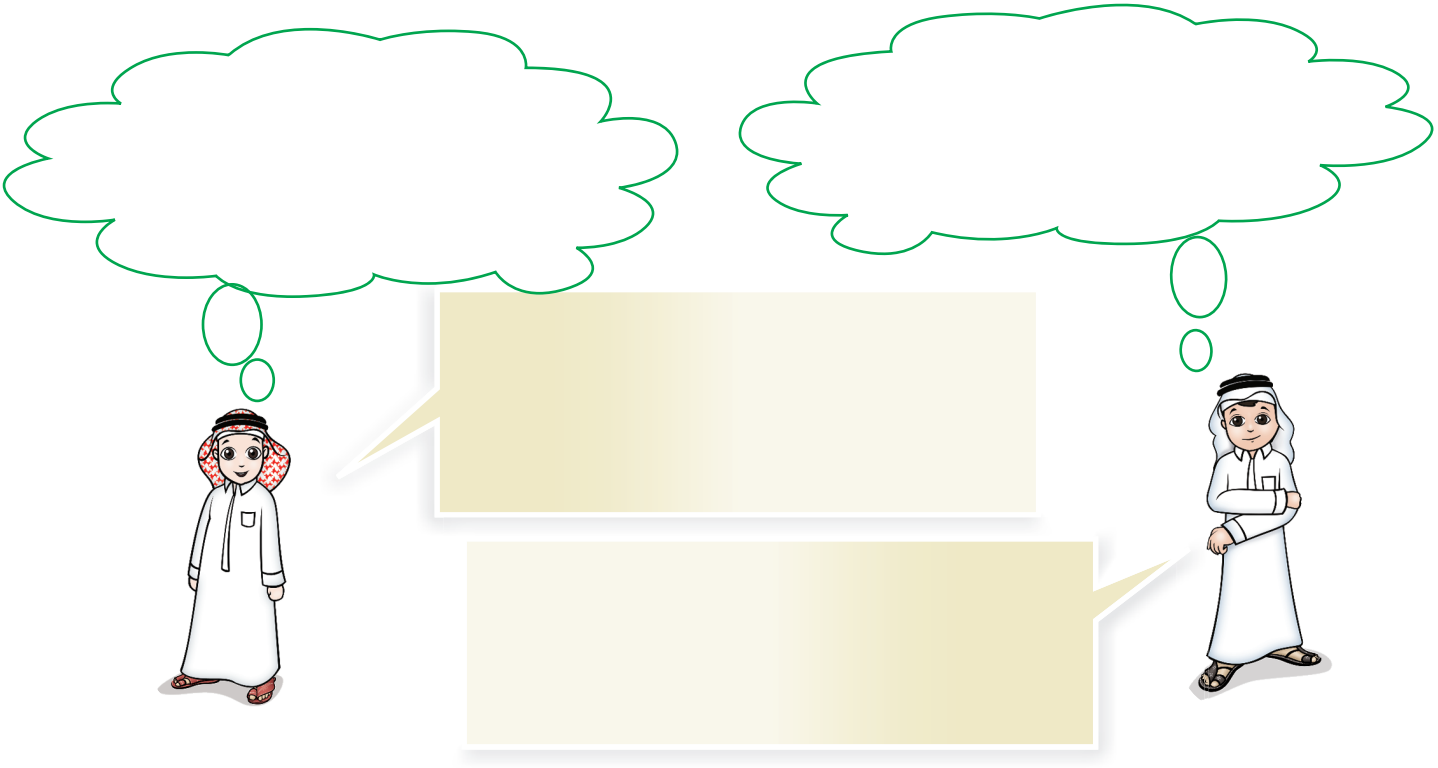
Task 3: LET'S TALK!

Read each sentence in Task 2 to a partner.

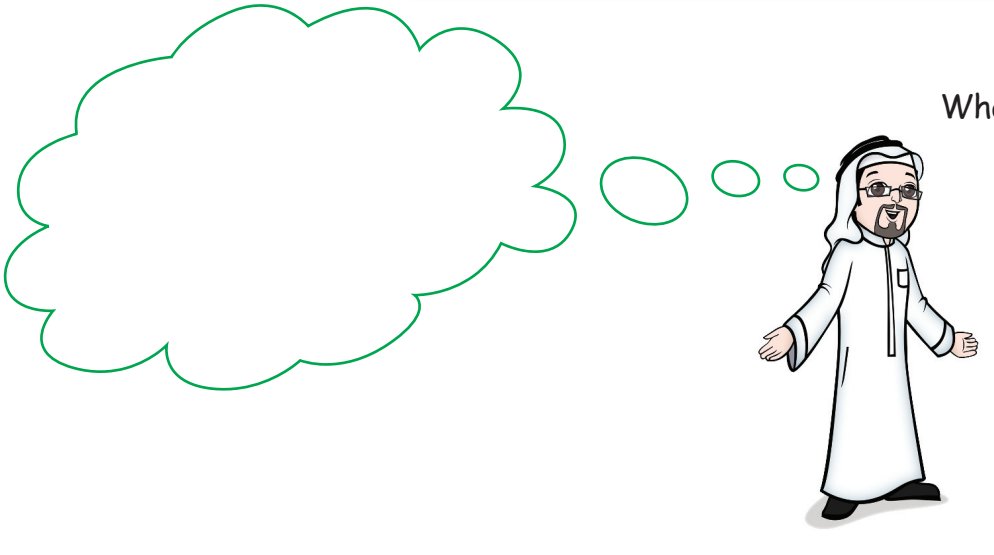
Task 4: JUST FOR FUN!

Write what you think Rashid and Mohammed are saying in the speech bubbles.

Write what they are thinking in the thought balloons.



What is Mr. Omar thinking?



TODAY'S MATHEMATICS KEYWORDS

Complete the table. Write a definition and draw a picture or give an example to match each keyword on this chart.

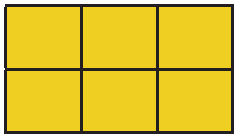
KEYWORD	MEANING	PICTURE or EXAMPLE
sequence		
term		
nth term		
term-to-term		
position-to-term		

HOMEWORK!

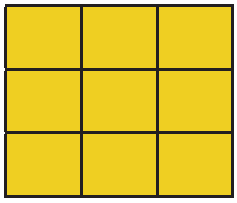
1) Cut out the squares at the bottom of the page.
2) Count the blocks in each shape.
3) Fill in the sequence table for the third shape.
   The first two have been done for you.
4) Build the next two shapes.
5) Complete the table.
6) Describe the term-to-term pattern.
7) Tell someone at home what you know about sequences.

1.

2.



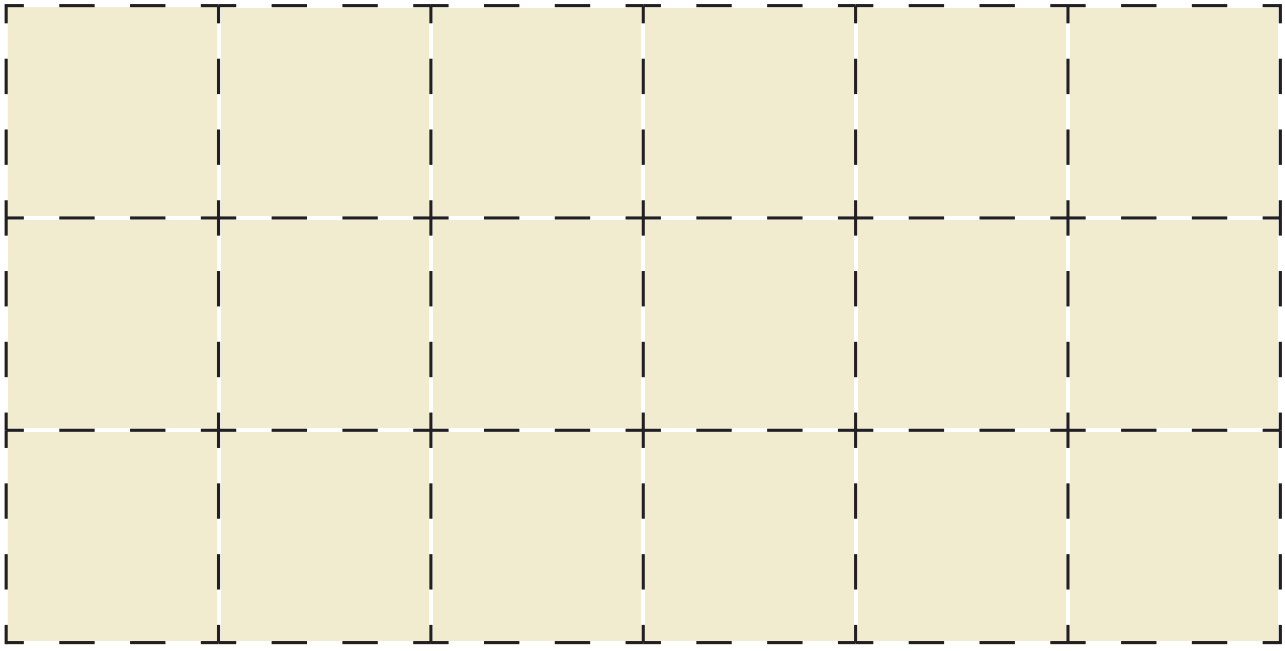
3.



position	1	2	3	4	5
term	3	6	9		

The term-to-term pattern is:

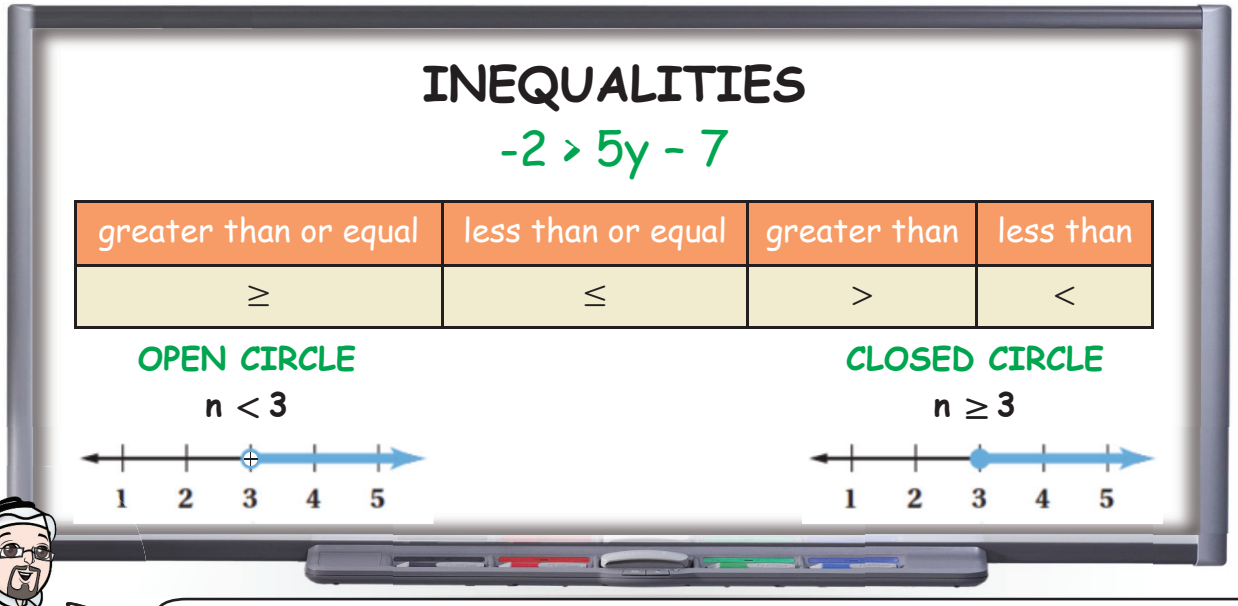
.....



INEQUALITIES

KEYWORDS: **inequality solution of inequality open circle○ closed circle● less than < less than or equal to ≤ greater than > greater than or equal to ≥**

Today, Mohammed and Khalid are learning about **inequalities**.
Read and listen to the lesson. Then, do the activities.



Good morning, class. Did you know that **inequality** means that the numbers on each side are not equal? How do we show an inequality, Khalid?

We can show an inequality by using a **greater than** or **less than** symbol, Mr. Ahmed.

There may be more than one solution. How can we show the solutions, Khalid?

Well, Mohammed, to show **solution of an inequality** the we can use arrows with circles at the end. Do you see the number lines on the board? How do we know when to use the right circle, Mr. Ahmed?

If the solution includes the number shown on the number line, then we use a **closed circle**. If the solution does not include the number shown on the number line, then we use an **open circle**.

INEQUALITIES

Task 1: **Choose the correct word from the box below to complete these sentences.**

greater than less than open circle closed circle inequality

1. When we show a solution from on a number line that includes the number, we use a ..... circle

2. When an expression or term is not equal to another expression or term, then it is a/an ..... .

3. If the number on the left of the symbol is smaller than the number on the right, we use the ..... symbol.

4. If the number on the left is larger than the number on the right, we use the ..... symbol.

5. If a solution set is greater than a number but not equal to that number, then we use a/an ..... .

Task 2: **MATCHING**

Draw lines to match each word with its picture or example.

1. greater than	a) $23 - 1 > 12 + 4$
2. inequality	b) 
3. closed circle	c) $>$
4. less than	d) 
5. open circle	e) $<$
6. solutions	f) $x = -1, 0, 1, 2, 3...$

Task 3: MULTIPLE CHOICE.

Circle the correct answer. Is it a, b or c?

1. The answers for an inequality are known as the ..... .

   a) open circles **b)** solutions **c)** closed circles

2. If the solutions include the number, the arrow starts with ..... .

   a) a closed circle **b)** an inequality **c)** an open circle

3. A(n) ..... should be treated like an equation.

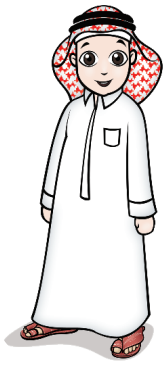
   a) inequality **b)** solution **c)** open circle

4. Inequalities that have the larger amount to the left use the ..... .

   a) less than sign **b)** greater than sign **c)** equal sign.

5. If the amount on the left is less, then we use the ..... .

   a) greater than sign **b)** closed circle **c)** less than sign.



ACTIVITY: Use any keyword and draw a cartoon to illustrate it.

Write the keyword in the box

TODAY'S MATHEMATICS KEYWORDS

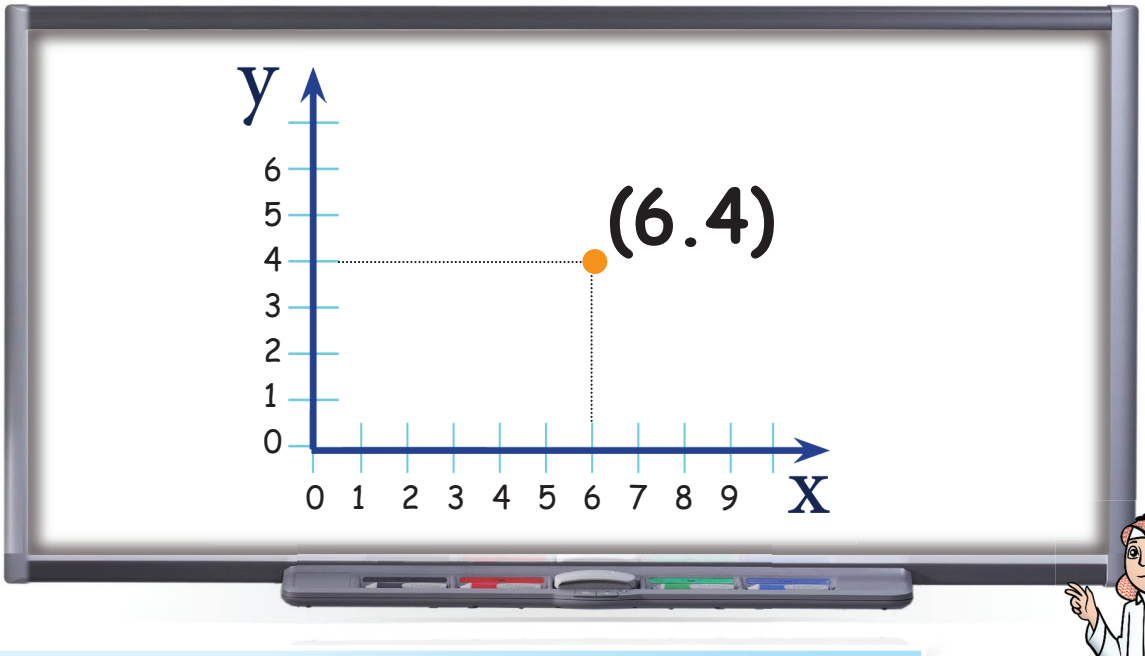
Write the **keyword** to match the meaning and picture or example for each row in the chart below.

inequality open circle closed circle less than
greater than solution of inequality

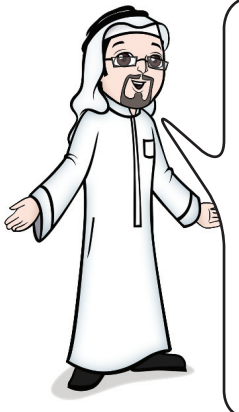
KEYWORD	MEANING	PICTURE or EXAMPLE
	The values on each side of the symbol are not equal.	$-2 > 5y - 7$
	The amount on the number line is included in this solution.	
	All the possible answers to the inequality.	-2,-1,0,1,2,
	When an amount on the number line is not included in that solution.	
	The value on the left is larger than the value on the right.	$>$
	The value on the left is smaller than the value on the right.	$<$

THE COORDINATE PLANE

KEYWORDS: graph x-axis y-axis coordinates x-coordinate y-coordinate



Good morning, Sir. Can you tell us about graphs and coordinates?



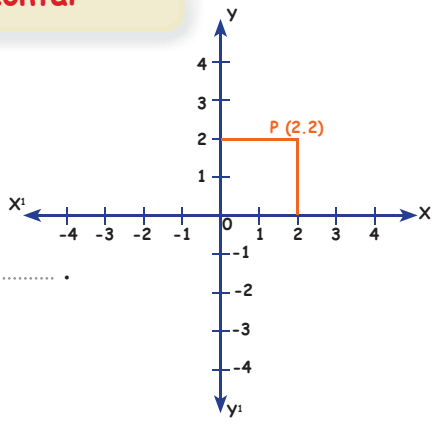
Yes! Look at the board.
A **graph** is a chart that shows relationships between numbers.
We use bars or lines.
On a **graph**, the **x–axis** goes across from left to right through zero.
It is a horizontal line.
The **y–axis** goes from top to bottom through zero. It is a vertical line.
Coordinates are two numbers that show an exact point on a graph. For example, (6,4). The 6 is the **x–coordinate**. We read it first. The 4 is the **y–coordinate**. We read it second.

So that's 6 to the right and 4 up. That's very clear, Sir. Thank you.

THE COORDINATE PLANE

Task 1: **Complete the following sentences using the words in the box.**

vertical	point	graphs	horizontal



1. The x-axis is a ..... line.
2. The y-axis is a ..... line.
3. Coordinates are 2 numbers that show an exact ..... .

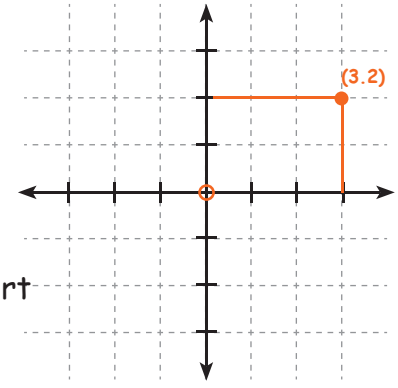
..... show relationships between numbers.

Task 2: **In each of these sentences, one word is wrong. Find it and correct it.**

1. The x-axis is a vertical line; it goes across. .....
2. 5 and 8 are coordinates on a picture. .....
3. In the coordinates (3,9), nine is the x-coordinate. .....
4. The y-axis is a horizontal line; it goes up and down. .....

Task 3: **MULTIPLE CHOICE**

Choose the correct answer. Is it a, b, or c?



1. The x-axis is a ..... line.

   a) vertical b) horizontal c) short

2. The y-axis is a ..... line.

   a) vertical b) horizontal c) short

3. We use brackets and a comma to write ..... .

   a) coordinates b) the x-axis c) the y-axis

4. In (7,2), 7 is the ..... .

   a) y-coordinate b) x-coordinate c) y-axis

5. In (7,2), it's 7 to the ..... and 2 up.

   a) right b) left c) middle

Task 4: PUZZLE TIME!

Do the crossword.

Across

3) A ..... has an x-axis and a y- axis.

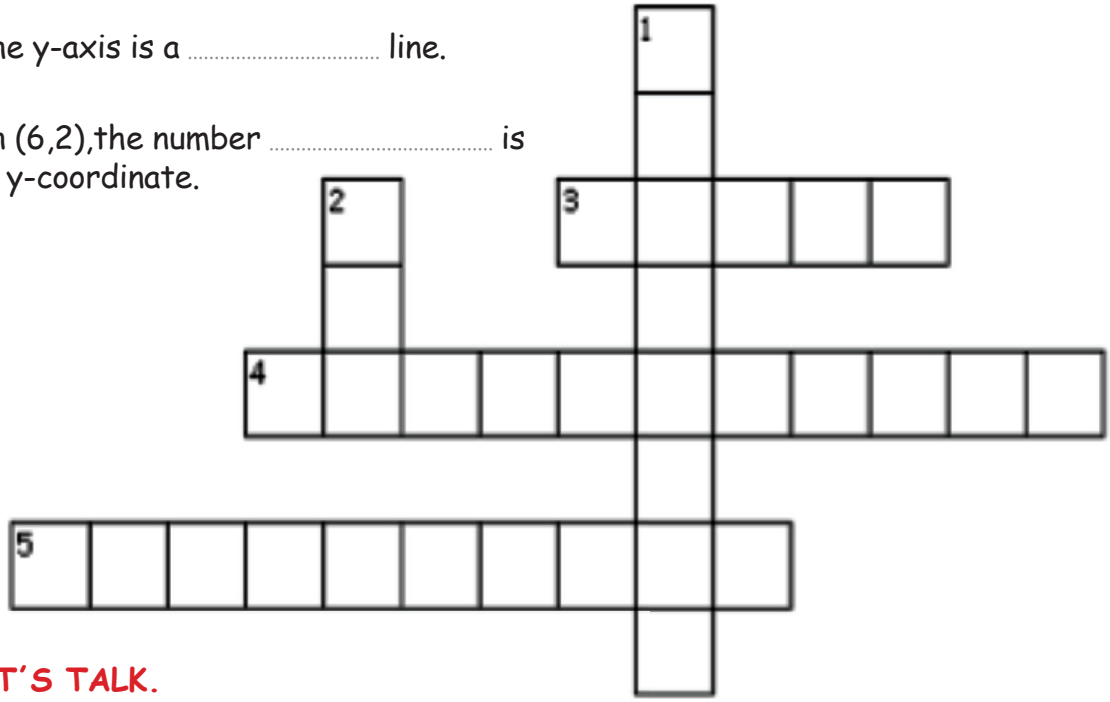
4) ..... are two numbers that show an exact point on a graph.

5) The x-axis is a ..... line.

Down

1) The y-axis is a ..... line.

2) In (6,2),the number ..... is the y-coordinate.



Task 5: LET'S TALK.

Ask a partner the following questions.

We are the two numbers that show the exact position on a graph. What are we?

I am the line on a graph that goes from side to side through zero. What am I?

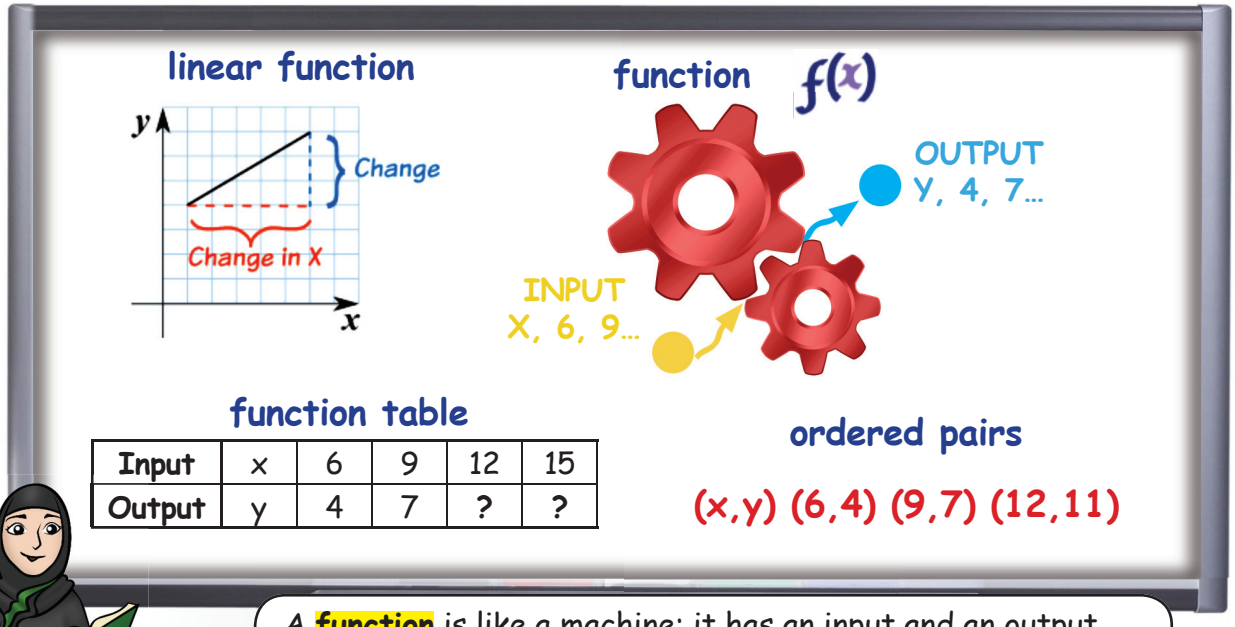
I am the line on a graph that goes straight up through zero. What am I?

When you read coordinates, you read me second. What am I?

When you read coordinates, you read me first. What am I?

LINEAR FUNCTIONS

KEYWORDS: function input output function rule function table ordered pairs linear function



Input	x	6	9	12	15
Output	y	4	7	?	?

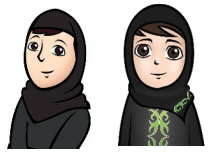
A **function** is like a machine: it has an input and an output. The function relates the input to the output in a specific way. It is often written as $f(x)$.
A function has three parts: **Input**, **Output**, and **Rule**.

The **input** is the number you begin with. The **output** is the changed number. The input is changed by the rule of the function. A **rule** tells how one number is related to another. On the board, the rule is: Subtract 2, if x-2=y, 6-2=4, and 9-2 =7.
What are the next two numbers?

That's easy! 12 – 2 = 10 and 15 – 2 = 13. I can see the function better when I arrange the input and output in a **function table** like the one on the board. What is a **linear function**?

A **linear function** is the rule that generates a straight line on a graph. You can write the input and output of a function as an **ordered pair (x,y),** such as (6,4) and (9,7). They are called ordered pairs because the input always comes first, and the output second: (input, output). We must have at least two ordered pairs to determine the correct rule.

Task 1: **Fill in the blank and read each sentence to a partner. Start with the letter given.**



1. The f ..... r ..... is the operation that changes the input.
2. (6,4) and (9,7) are examples of an o ..... p .....
3. The number that you begin with in a function is called the i .....
4. If you can graph the function as a straight line, it is a l ..... f .....
5. The number that is changed by the function rule is called the o .....
6. A f ..... relates an input to an output.

Task 2: **PUZZLE TIME!**

a) Unscramble each of the clue words.

F O U T I C N N

7		14			12		9

T U F N I N C O

						13	

T E L B A

			1	4

F I N U O C N T

			10				3

R L E U

6			

U T P N I

			8	

P U U T O T

					11

D O R R E D E

A R P I

5	2		

b) Then copy the letters in the numbered boxes to the boxes with the same number.

1	2	3	4	5	6

7	8	9	10	11	12	13	14

TODAY'S MATHEMATICS KEYWORDS

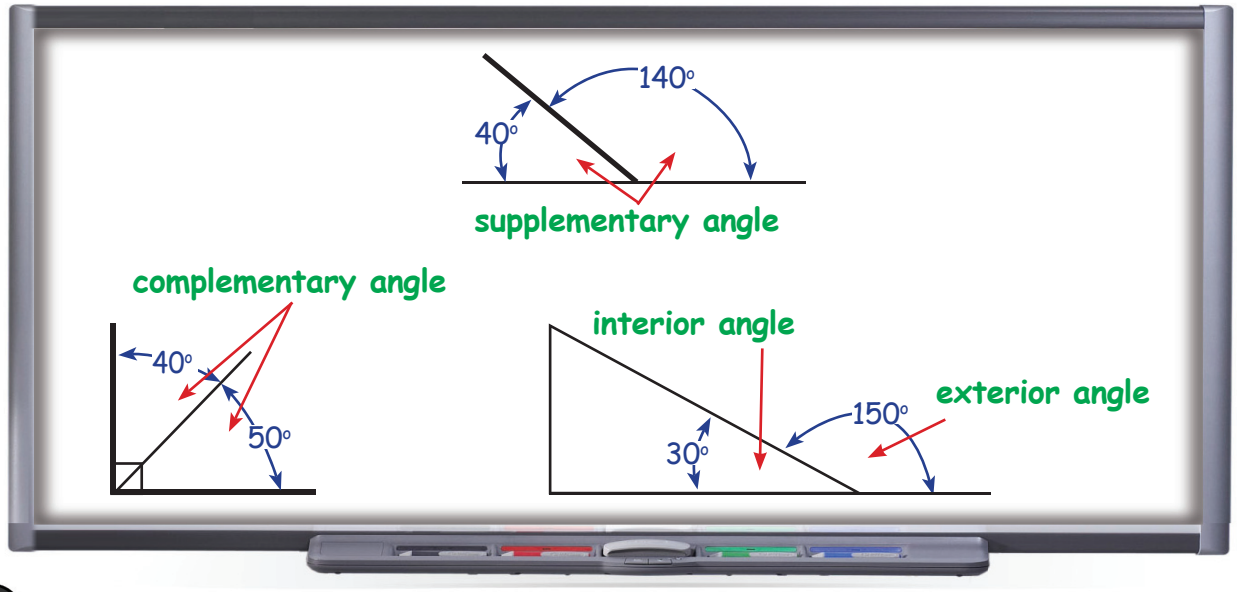
Complete the table. Write each word in the boxes below. Next to the word write its meaning, and in the last box draw a picture or give an example.

function input output function rule
function table ordered pair linear function

KEYWORD	MEANING	PICTURE or EXAMPLE

ANGLES 1

KEYWORDS: interior angle exterior angle supplementary angle complementary angle



Hello, girls. Today we are going to talk about angles. Look at the board and tell me about these angles.

Yes, Mrs Hessa. An **interior angle** is the angle inside a shape.
An **exterior angle** is the angle outside a shape.
Complementary angles are two angles that add up to 90°.
Supplementary angles are two angles that add up to 180°.

How can we remember that?

C for Complementary stands for **C**orner of 90°.

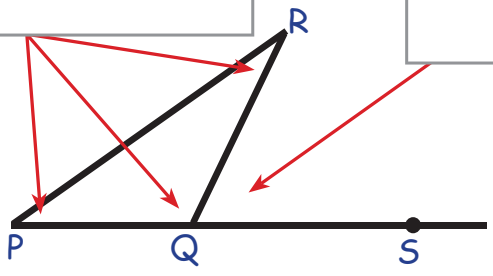
S for Supplementary stands for **S**traight angle of 180 °.

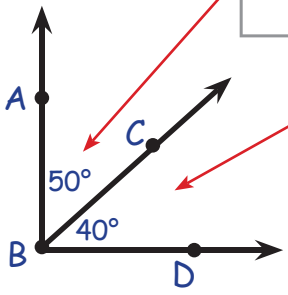
So that's C for Corner... and S for Straight angle!

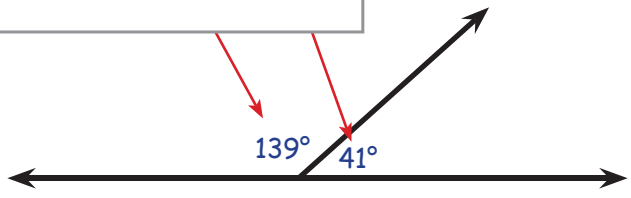
Task 1: LABEL.

Use these terms to label each angle.

supplementary angle | interior angle | complementary angle | exterior angle



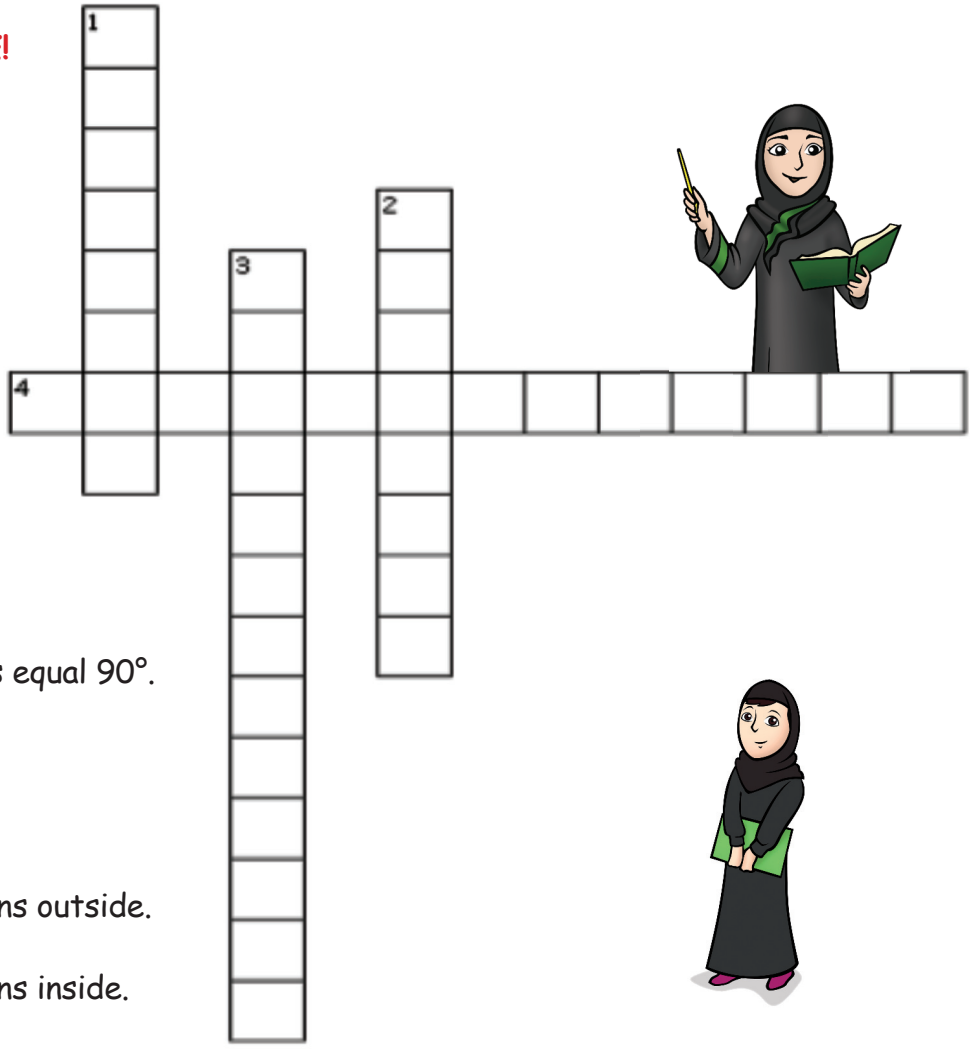




Task 2: PUZZLE TIME!

Work in pairs.

Do the crossword.



Across

4) Two ..... angles equal 90°.

Down

1) ..... means outside.

2) ..... means inside.

3) Two ..... angles equal 180 °.

Task 3: LET'S TALK.

My angles add up to 180°. What am I?

My angles add up to 90°. What am I?

I am outside a shape. What am I?

I am the angle inside a shape. What am I?

Task 4: COMPLETE.

Use these words to complete the sentences.

outside | supplementary | straight | corner | inside | right

1. A supplementary angle makes a ..... line.
2. A complementary angle makes a ..... angle.
3. When we add two ..... angles together, we get a straight angle.
4. An interior angle is ..... a shape.
5. An exterior angle is ..... a shape.
6. When we add two complementary angles together, we make a ..... angle.

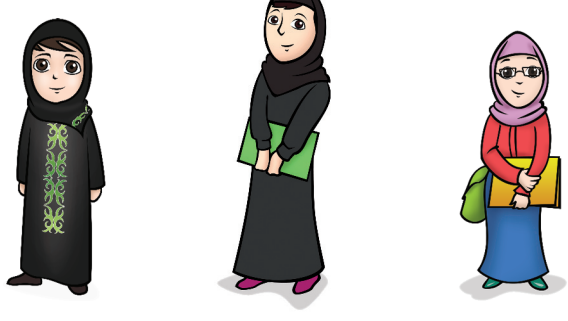
Task 5: MATCHING.

a) An angle of 40^0 and an angle of 50^0 make this angle. — interior

b) An angle of 120^0 and 60^0 make this type of angle. — straight line

c) An angle inside a shape is called an ..... angle. — exterior

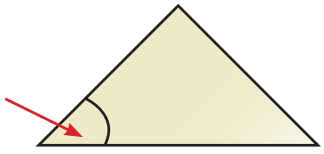
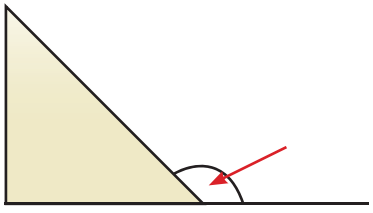
d) An angle outside a shape is called an ..... angle. — right angle



TODAY'S MATHEMATICS KEYWORDS

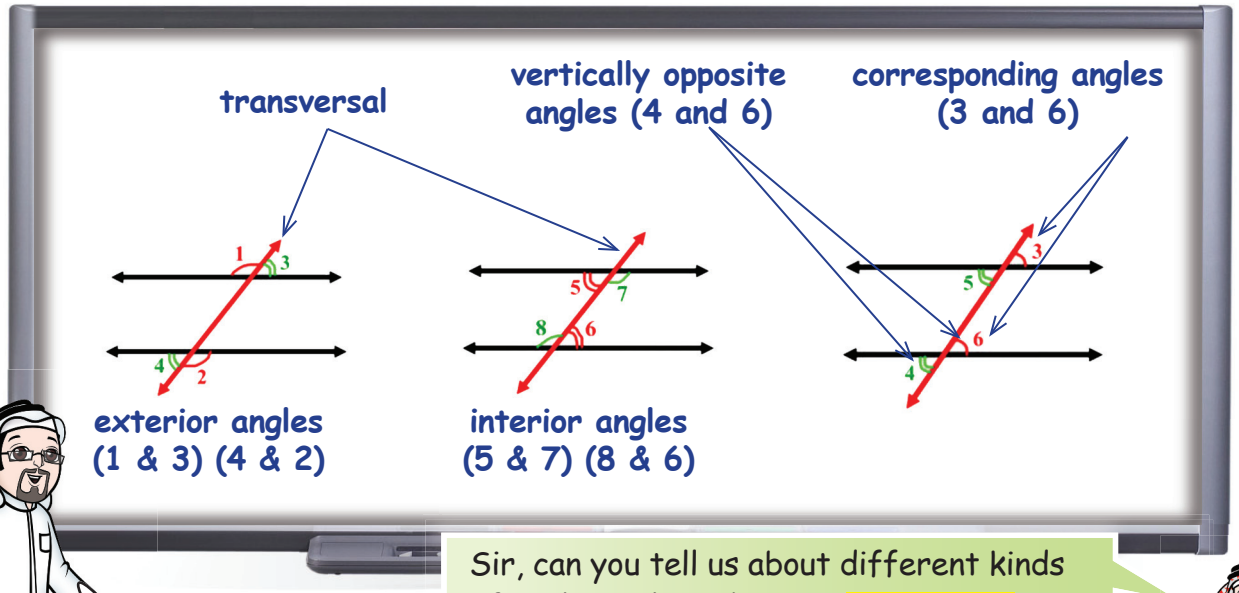
Complete the table. Match the keywords listed below with either the meaning or picture/example. Fill in all blanks in all columns: keywords, meaning, picture or example.

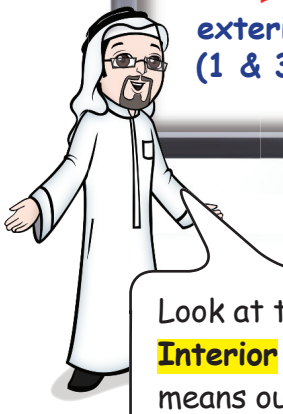
interior angle exterior angle
supplementary angle complimentary angle

KEYWORD	MEANING	PICTURE or EXAMPLE
	The angle inside a shape.	
exterior angle		
supplementary angle		
	Two angles that add up to 90° .	

ANGLES 2

KEYWORDS: transversal interior angle exterior angle corresponding angle vertically opposite angle





Sir, can you tell us about different kinds of angles? Also, what is a **transversal**?

Look at the board. A **transversal** is a line that crosses two or more lines. **Interior** means inside, so an **interior angle** is inside a shape. **Exterior** means outside, so an **exterior angle** is outside a shape. Now, can you tell me about **corresponding angles** and **vertically opposite angles**?

Correspond means 'matches with', so **corresponding angles** are angles in the same position on another line and they are equal.
When two lines cross each other, they make **vertically opposite angles**. These are two sets of angles that are opposite and equal to each other.

Task 1: MATCHING.

Draw lines to match each term with its meaning.

1 exterior	a) a line that crosses other lines
2 vertically opposite	b) inside
3 correspond	c) outside
4 transversal	d) match with
5 interior	e) opposite and equal to each other

Task 2:

Choose the correct word from the box to complete the sentences. Use each word once.

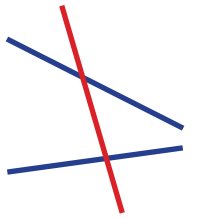
exterior	transversal	interior	corresponding

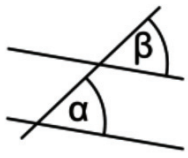
1. ..... angles are inside a shape.
2. ..... angles are outside a shape.
3. ..... angles are equal to each other.
4. The ..... is a line that cuts two or more lines.

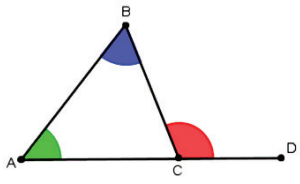
Task 3: MATCHING.

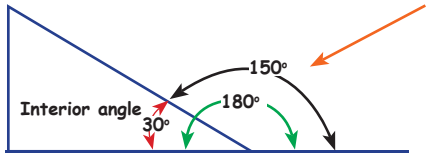
Draw lines to label the pictures.

1. corresponding angles
2. vertically opposite
3. interior angles (x2)
4. exterior angle
5. transversal









Task 4: PUZZLE TIME!

Work in pairs to the crossword puzzle.

Across

3) A ..... is a line that crosses two or more lines.

5) ..... angles are inside a shape.

Down

1) ..... means 'to match'

2) ..... angles are in the same position and are equal.

4) ..... angles are outside a shape.

Task 5: LETS TALK!

Ask and answer the questions with your friend.

What is another word for 'matches with'?

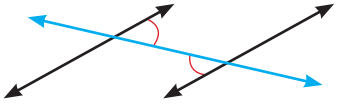
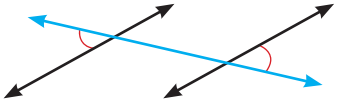
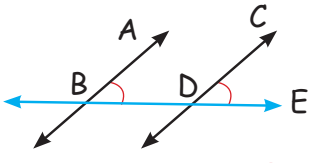
What does exterior mean?

What's the opposite of exterior?

TODAY'S MATHEMATICS KEYWORDS

Complete the table. Match the keywords listed below with either the meaning or picture/example. Fill in all blanks in all columns: keywords, meaning, picture or example.

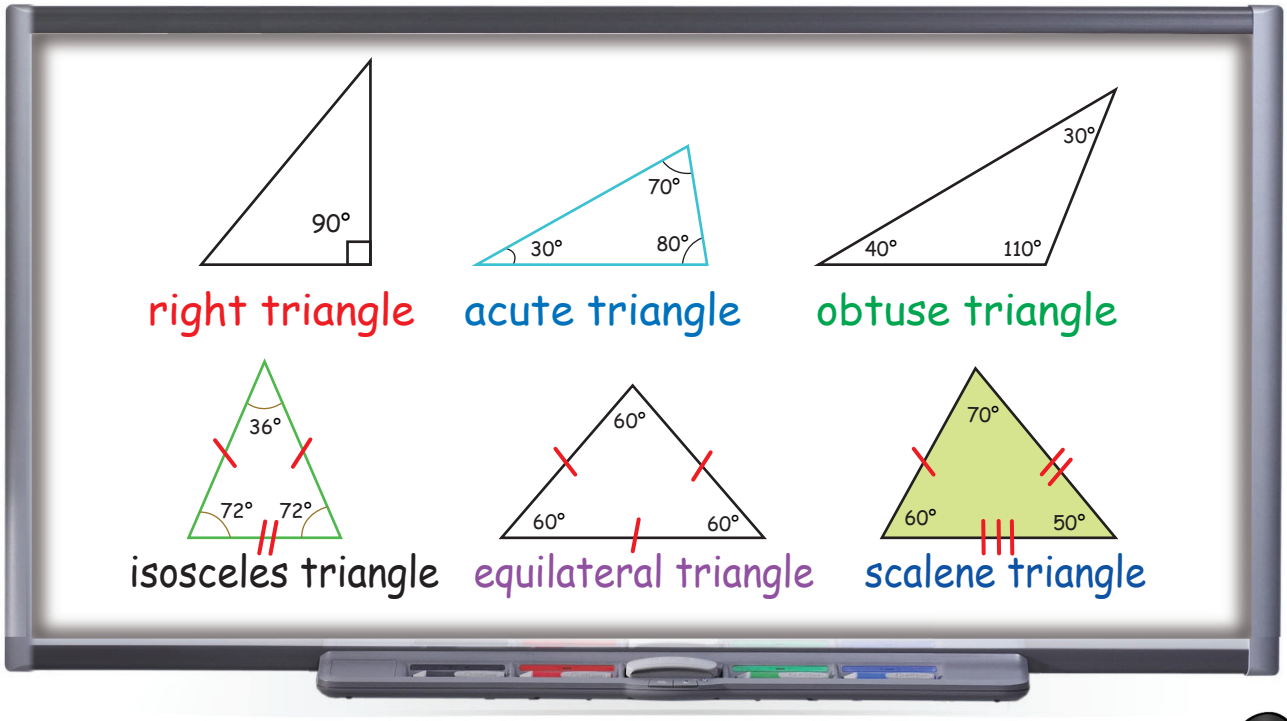
exterior angles transversal interior angles
corresponding angles vertically opposite angles

KEYWORD	MEANING	PICTURE or EXAMPLE
transversal	A line that crosses two or more lines.	
	Angles inside a shape.	
exterior angles		
		 ∠ ABD = ∠ CDE
vertically opposite angles	Two angles that are opposite each other when 2 lines cross.	

TRIANGLES

KEYWORDS: isosceles triangle, equilateral triangle, scalene triangle, right triangle, acute triangle, obtuse triangle

Huda, Sheikha and Maha are learning about **triangles**.
Read and listen to the lesson. Then, do the activities.



Hello, class. Today, we are looking at angles in triangles. The sum of the 3 angles in a triangle is always 180°. How can that fact help us calculate each angle in a triangle?

I know! If we know 2 angles, we can find out the third angle. We just subtract the sum of 2 angles from 180°. An **equilateral triangle** is easiest. Since the sides are equal, all three angles are the same. 180° divided by 3 is 60°.

That's correct Huda. An **isosceles triangle** is also easy because it has two equal sides and two equal angles. A **scalene triangle** has no equal sides or angles, so you need to know 2 angles to calculate the third.

Does anyone remember how we classify triangles by their angles?

I love triangles

I remember! A **right triangle** has one 90° angle and 2 acute angles. An **obtuse triangle** has one obtuse angle and 2 acute angles. An **acute triangle** has 3 acute angles.

Equilaterals are my favorite triangles!

Yes! So an equilateral triangle is always an acute triangle because each angle is 60°.

Task 1: **MATCHING.**

Draw lines to complete each sentences.

1 An equilateral triangle	a) has two equal sides and two equal angles.
2 An isosceles triangle	b) has one angle between 90° and 180°.
3 An obtuse triangle	c) has 3 angles less than 90°.
4 An acute triangle	d) has one 90° angle.
5 A right-angled triangle	e) has 3 equal sides and angles.

Task 2: TRUE or FALSE.

Are the following sentences true or false? Correct the false sentences.

1. A triangle has 3 sides and 3 angles. **TRUE**
2. An isosceles triangle has 3 sides and angles the same. .....
3. An equilateral triangle has a right angle . .....
4. A scalene triangle has no sides or angles the same. .....
5. An obtuse triangle has a right angle. .....

Task 3: MULTIPLE CHOICE!

Choose the correct answer. Is it a, b or c?

1. A / An ..... triangle has 3 angles and sides the same.

   a) isosceles b) equilateral c) right

2. A / An ..... triangle has an obtuse angle.

   a) right b) scalene c) obtuse

3. A / An ..... triangle has 3 different sides and angles.

   a) scalene b) equilateral c) right

4. A / An ..... triangle has 2 sides and angles the same.

   a) isosceles b) scalene c) acute

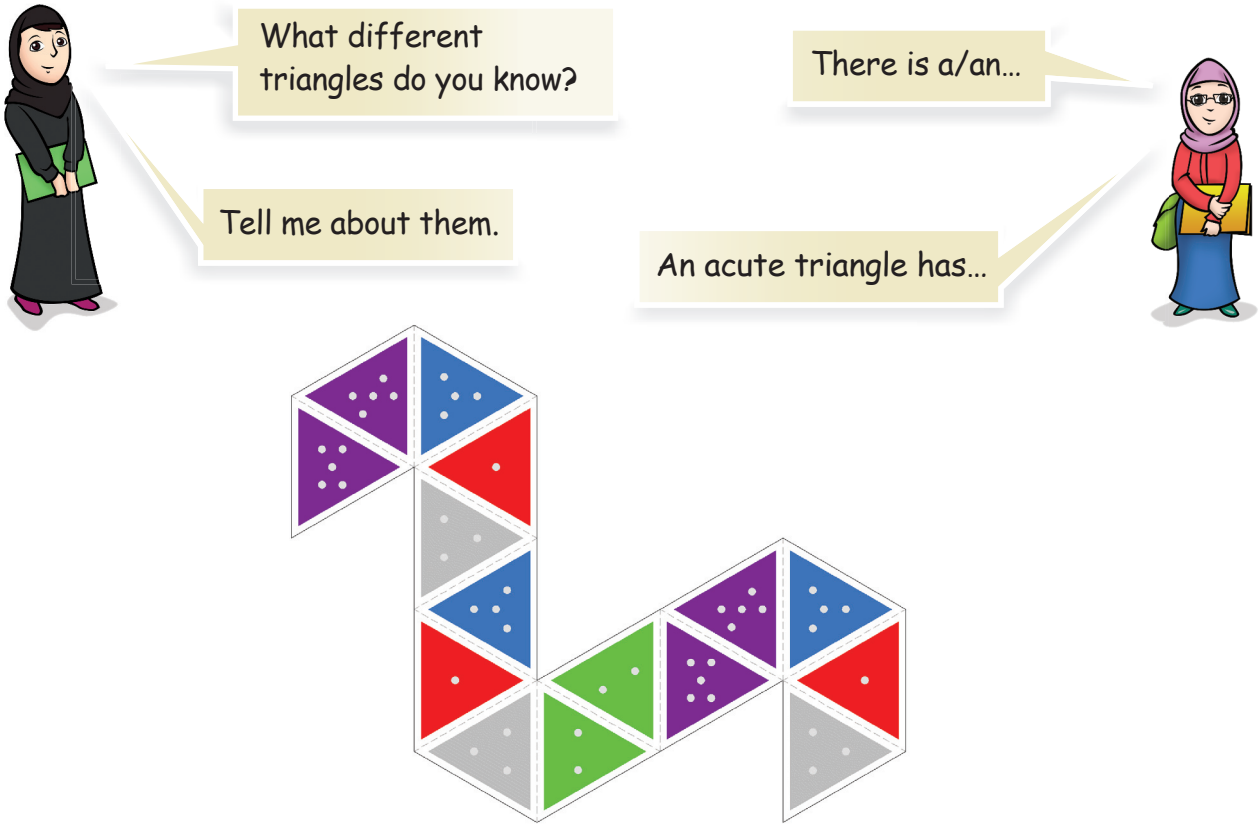
Task 4: LET'S DRAW!

Unscramble the letters and draw the correct triangle that illustrates each word.

1. selisceso .....
2. elenasc .....
3. esubto .....

Task 5: LET'S TALK!

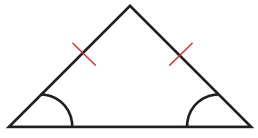
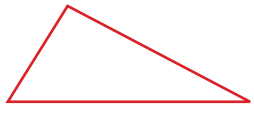
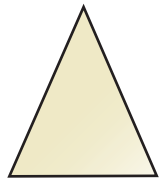
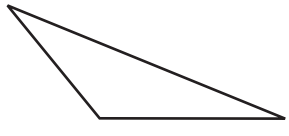
Ask and answer these questions.



TODAY'S MATHEMATICS KEYWORDS

Complete the table. Match the keywords listed below with either the meaning or picture/example. Fill in all blanks in all columns: keywords, meaning, picture or example.

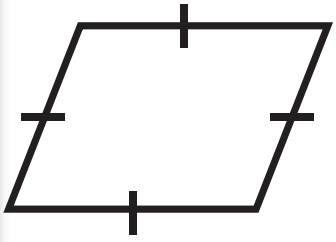
acute triangle | equilateral triangle | scalene triangle
right triangle | obtuse triangle | isosceles triangle

KEYWORD	MEANING	PICTURE or EXAMPLE
equilateral triangle	A triangle with all angles and all sides congruent.	
	A triangle with two congruent sides and two congruent angles.	
scalene triangle		
right triangle	A triangle with one right angle.	
	A triangle with three acute angles all less than 90°.	
obtuse triangle		

FOUR-SIDED SHAPES

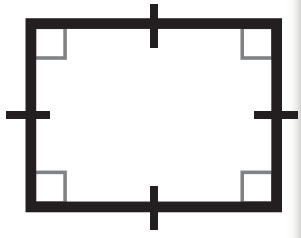
KEYWORDS: quadrilateral rectangle parallel parallelogram rhombus

quadrilateral: a four-sided shape.



rhombus

rectangle



square

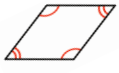
All these are parallelograms.

What's a quadrilateral, Sir? It sounds difficult. The shapes on the board are **quadrilaterals** (KWA-DRI-LA-TER-ALS). Can you tell us what a **quadrilateral** is?

Yes, I can. A **quadrilateral** is any shape with four straight sides. Can you tell me about a square and a rectangle, Khalid?

Yes. A square has four equal sides and four right angles. A **rectangle** has two pairs of equal, opposite sides and four right angles. But what does parallel mean, and what is a parallelogram?

Parallel lines are straight lines which always stay the same distance apart. You can see that the square and the rectangle both have 2 sets of parallel lines. A **parallelogram** is a four-sided shape with all its opposite sides parallel. All the shapes on the whiteboard are parallelograms. A **rhombus** is a parallelogram with congruent (equal) sides and congruent opposite angles. Like this.



FOUR-SIDED SHAPES

Task 1: TRUE or FALSE.

One of these sentences is FALSE. Which one is it? Explain why.

1. A rhombus has four equal sides. **TRUE** **FALSE**
2. A rhombus has four equal angles. **TRUE** **FALSE**
3. A rhombus is a quadrilateral and a parallelogram. **TRUE** **FALSE**

Number ..... is FALSE, because .....

Task 2: WHAT SHAPE AM I?

Write the names of these four-sided shapes. Then DRAW THE SHAPE!

All my sides are the same length, but my angles aren't all equal.

What shape am I? .....

Draw me here.

All my angles are the same and so are all my sides.

What shape am I? .....

Draw me here.

All my angles are 90° and I have two pairs of sides that are the same length.

What shape am I? .....

Draw me here.

Task 3: MULTIPLE CHOICE.

Choose the correct answer. Is it a, b, or c?

1. Lines that are the same distance apart all the time are ..... .

   a) parallel b) rectangular c) rhombuses

2. A rhombus has equal ..... angles.

   a) parallel b) right c) opposite

3. Rectangles and squares are both ..... .

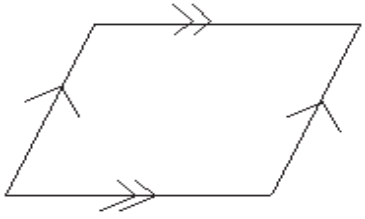
   a) rhombuses b) parallelograms c) exactly the same.

4. Rhombuses, rectangles and squares are all ..... .

   a) parallelograms b) quadrilaterals. c) Both a and b

Task 4: TRUE or FALSE

Look at this shape. Are the sentences TRUE or FALSE?



1. This is a rhombus. **TRUE** **FALSE**
2. It has equal opposite angles. **TRUE** **FALSE**
3. It is a quadrilateral. **TRUE** **FALSE**
4. Two angles are more than 90°. **TRUE** **FALSE**
5. All angles are the same. **TRUE** **FALSE**
6. Opposite sides are parallel. **TRUE** **FALSE**

Task 5: LET'S TALK.

Ask and answer these questions about triangles:

What's a quadrilateral?

What is a rhombus?

What's the difference between a rhombus and a square?

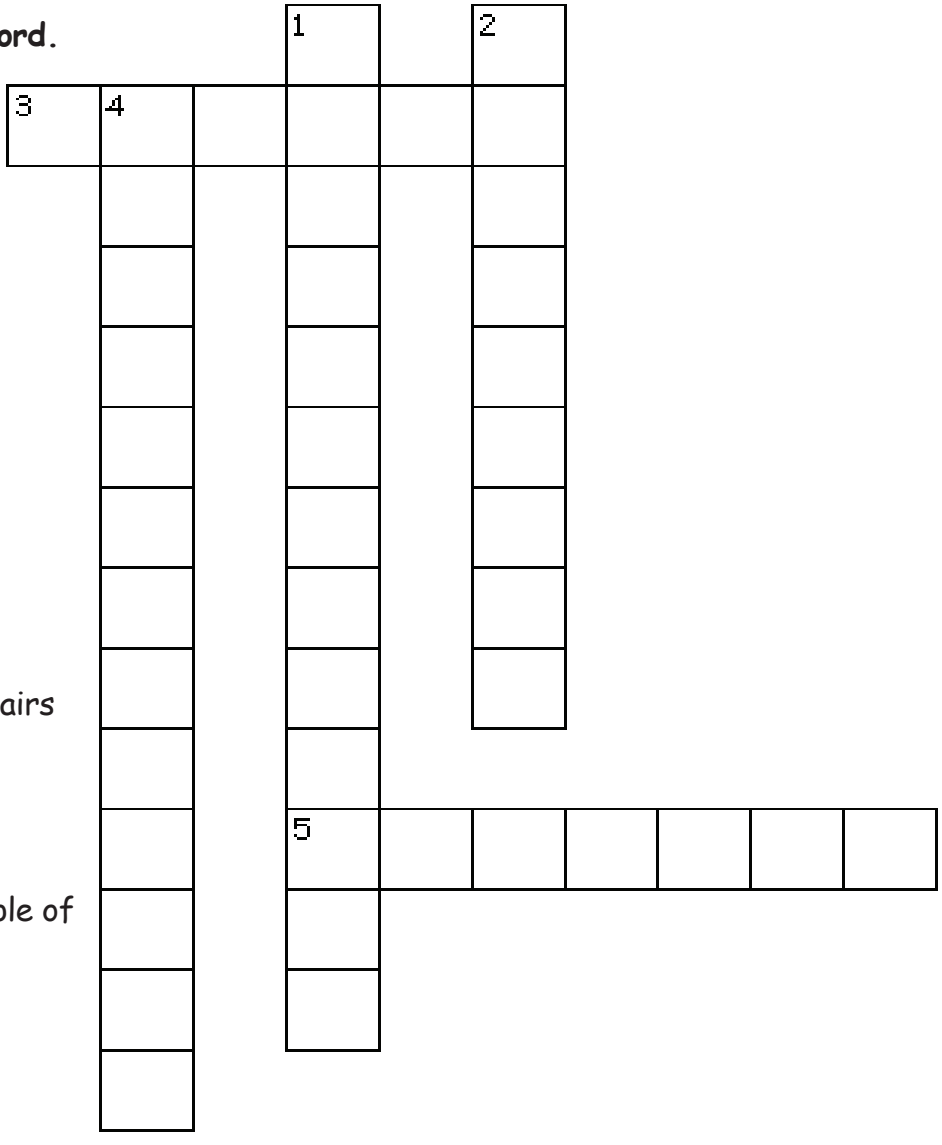
Easy! It's a shape...

A rhombus is...

A rhombus is... but a square is...

Task 6: PUZZLE TIME!

Complete the following crossword.



Across

3) A shape with four congruent sides and four congruent angles is a ..... .

5) This shape  is a ..... .

Down

1) Any shape with two pairs of parallel sides is a ..... .

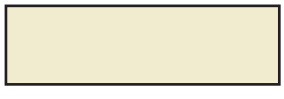
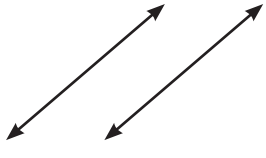
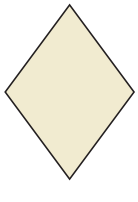
2) This page is an example of this shape.

4) Any shape with four straight sides is a .....

TODAY'S MATHEMATICS KEYWORDS

Complete the table. Match the keywords listed below with either the meaning or picture/example. Fill in all blanks in all columns: keywords, meaning, picture or example.

parallel rectangle rhombus
quadrilateral parallelogram

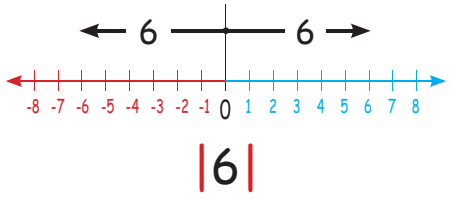
KEYWORD	MEANING	PICTURE or EXAMPLE
quadrilateral	Any shape with four straight sides.	
rectangle		
	Two lines that always stay the same distance apart.	
parallelogram	A four-sided shape with all its opposite sides parallel.	
	A parallelogram with congruent (equal) sides and congruent opposite sides.	

GRADE 7 QUIZ

Task 1: CAN YOU REMEMBER THE KEYWORDS FROM THIS SEMESTER?

Complete the table. Match the keywords listed below with either the meaning or picture/example. Fill in all blanks in all columns: keywords, meaning, picture or example.

decimal negative integer absolute value index/exponent/power
cubed square root radical sign √ additive inverse squared equation

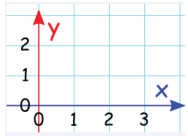
	KEYWORD	DEFINITION	PICTURE or EXAMPLE
1		The product of using the base as a factor three times.	2^3 $2 \times 2 \times 2 = 8$
2	radical sign	A symbol that means the root of a number.	
3	negative integer		-3
4		The product of using the base as a factor two times.	4^2 $4 \times 4 = 16$
5			 $\|6\|$

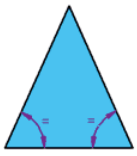
	KEYWORD	DEFINITION	PICTURE or EXAMPLE
6		The expression on the left of the equal sign is equal to the number expression on the right.	$x + 2 = 6$
7	additive inverse		$3 + (-3) = 0$
8		The number used as a factor two times to give the number inside the radical.	$\sqrt{9} = 3$
9	decimal	a number that uses a decimal point followed by digits that show values less than one	
10	exponent index power		9^2

Task 2: MATCHING

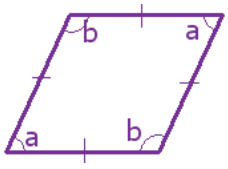
Help us draw lines to match the words with their correct meaning or picture.

1. rhombus
2. closed circle
3. x-axis
4. isosceles triangle
5. open circle
6. y-coordinate
7. vertically opposite angles
8. parallelogram
9. transversal
10. inequality

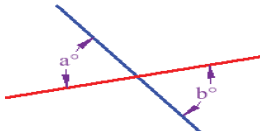
a) 

b) 

c) $n \geq 3$

d) 

e) (3, 9)

f) 

g) $n < 3$

h) $-2 > 5y - 7$

i) 

j) 

Task 3: MULTIPLE CHOICE!

Choose the correct words to complete the following sentences

1. The ..... is the number changed by the function rule.
   a) function **b)** input **c)** output

2. A ..... makes a straight line when it is graphed.
   a) linear function **b)** function rule **c)** function table

3. The ..... is the change applied to the input to make the output.
   a) linear function **b)** function rule **c)** function table

4. A ..... is any flat shape with four straight sides
   a) triangle **b)** polygon **c)** quadrilateral

5. A ..... has four straight sides and four right angles.
   a) triangle **b)** rectangle **c)** quadrilateral

6. Two angles are ..... if they add up to 180°.
   a) supplementary **b)** complementary **c)** interior

7. Angles on the inside of a shape are ..... angles.
   a) supplementary **b)** complementary **c)** interior

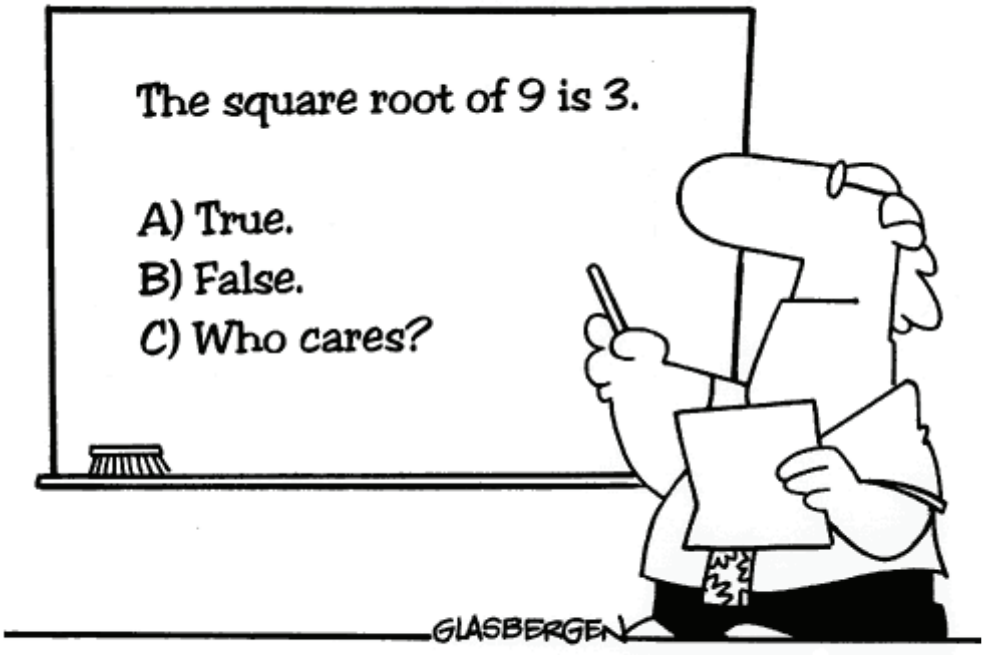
8. Two angles are ..... if they add up to 90°.
   a) supplementary **b)** complementary **c)** interior

9. A triangle with no equal angles or sides is a/an ..... triangle
   a) acute **b)** scalene **c)** equilateral

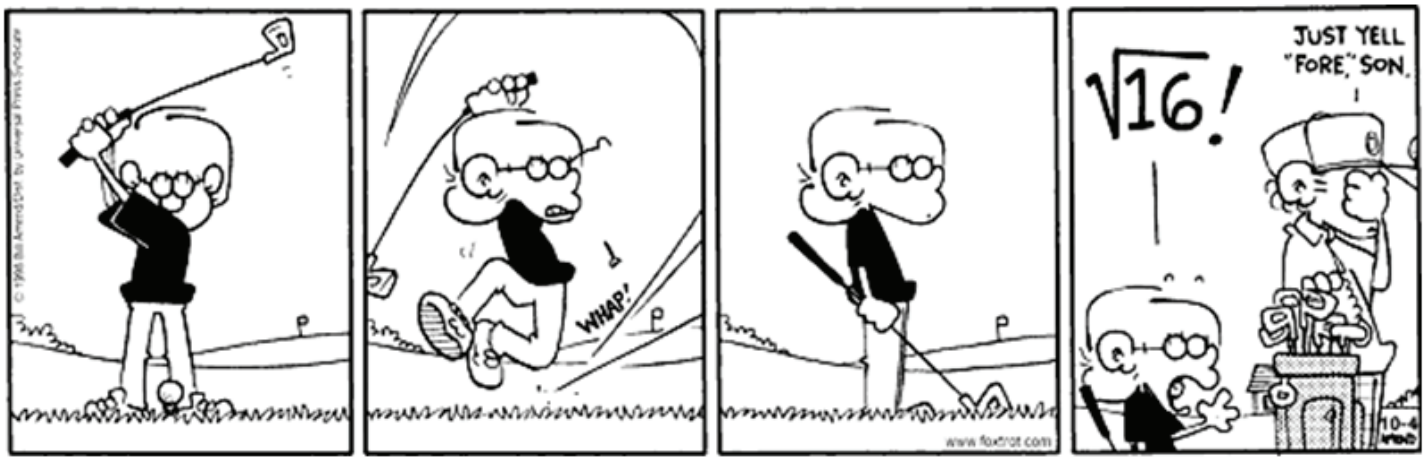
10. A triangle with an angle that is > 90° is a/an ..... triangle.
    a) scalene **b)** obtuse **c)** equilateral

JUST FOR FUN!

When you have completed the quiz and checked your answers, read these cartoons. On the next page, make your own cartoon about any keyword you learned this semester.



Many students actually look forward to Mr. Atwadder's math tests.



ACTIVITY: Use any keyword and draw a cartoon to illustrate it.
Write the keyword in the box

My KEYWORD:

quotient $4\overline{)24}$ 6

The answerin a division problem.

x-axis

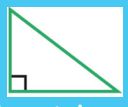
index

opposites

-3 and 3

Two integers that are the same distance from zero on a number line.

right triangle



A triangle with one right angle.

term

sequence

radical sign √

A symbol meaning the root of the number following it.

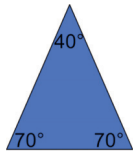
For example **√81 = 9**

GLOSSARY

GLOSSARY

A

absolute value
(pg. 14)
How far a number is from zero on a number line.

acute triangle


(pg. 57)
A triangle with three acute angles all less than 900

addition of decimals
$$\begin{array}{r} 2.34 \\ +\,1.15 \\ \hline 3.49 \end{array}$$
(pg. 10)
To add decimals, line up the decimal points and add.

additive inverse
$-2 + 2 = 0$
$3 + -3 = 0$
(pg. 19)
The numbers you add to another number to get zero.
The negative of a number.

ascending order
(pg. 14) *-2, -1, 0, 1, 2, 3*
An arrangement of integers from lowest to highest.

B

base
$10^3 = 10 \times 10 \times 10$
(pg. 22)
The number used as a factor.
In 10^3, the base is 10.

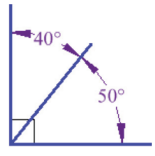
C

closed circle


(pg. 37)
The solution of the inequality includes the number shown on the number line.

coefficient
$5c$
(pg. 27)
The number used to multiply a variable.

comparing integers
$-7 < +3$
(pg. 14)
Using > or < or =, to show if numbers are larger, smaller or equal to each other.

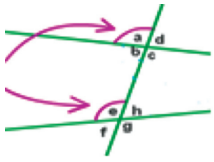
complementary angles


(pg. 48)
Two angles that add to 900 .

coordinates
(2,1)
(pg. 42)
Two numbers that show an exact point on a graph.

corresponding angles

(pg. 53)



Angles in the same position on another line.

cubed

(pg. 22) $2^3 = 2 \times 2 \times 2 = 8$

To use the base as a factor three times.

D

decimal 4.25

(pg. 10)

A number that uses a decimal point followed by digits to show values less than one.

descending order

(pg. 14)

5, 4, 3, 2, 1, 0, -1, -2...

An arrangement of integers from highest to lowest.

dividend $4\overline{)24}$

(pg. 10)

The number that is being divided.

divisor $4\overline{)24}$ (6)

(pg. 10)

The number you divide by.

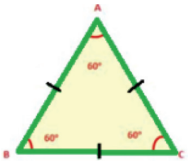
E

equation $4x + 3y = 24$

(pg. 27)

A maths sentence that contains an equal (=) sign.

equilateral triangle



(pg. 57)

A triangle with three equal angles (60^0) and three equal sides.

exponent $4^3 = 4 \times 4 \times 4$

(pg. 22)

Tells us how many times to use the base as a factor.

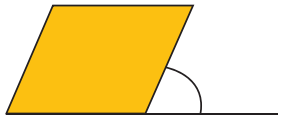
In 4^3, the exponent is 3.

expression $4x + 3y$

(pg. 27)

Has numbers, variables and operation signs (+ - x), but no equal sign.

exterior angle



(pg. 48, 53)

The angle outside a shape.

GLOSSARY

F

factor $6 \times 4 = 24$

(pg. 19)

A number that is multiplied by another number.

function $3 \rightarrow \boxed{\times 2} \rightarrow 6$

(pg. 45)

Relates the input to the output in a specific way.

function rule

(pg. 45)

An expression that describes the relationship between each input and output.

function table

(pg. 45)

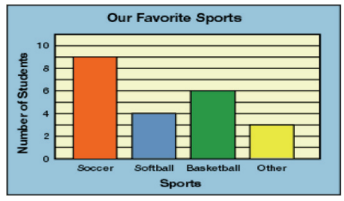
A table used to organize the input numbers, output numbers, and the function rule.

Input (x)	Output (2x – 7)
0	-7
1	-5
2	-3
3	-1
4	?

G

graph

(pg. 42)



A chart that shows relationships between numbers. We use bars or lines.

greater than $>$

(pg. 37)

The number on the left is larger than the number on the right.

greater than or equal to $\geq$

(pg. 37)

The number on the left is larger than, or the same as, the number on the right.

I

index $3^2 = 3 \times 3$

(pg. 22)

Tells us how many times to use the base as a factor.
Same as exponent or power.

GLOSSARY

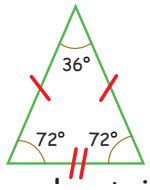
inequality
(pg. 37)
A mathematical sentence that contains $<, >, \neq, \leq, \geq$.

input
$2 \times 3 = 6$
(pg. 45)
The number you begin with when using a rule or function.

integer …-2, -1, 0 1, 2 …
(pg. 14)
A number with no fractional part.

interior angle

(pg. 48, 53)
The angle inside a shape.

isosceles triangle


2
(pg. 57)
A triangle with at least sides of the same length.

L

less than <
$-3 < -1$
(pg. 37)
The number on the left is smaller than the number on the right.

less than or equal to ≤
(pg. 37)
$x + 2 \leq 9$
The number on the left is smaller than or the same as the number on the right.

like terms
$3y + 2y$
(pg. 27)
Terms with exactly the same variable.

linear function
(pg. 45)
The rule that generates a straight line on a graph.

M

multiplication of decimals
(pg. 10)
$4.2 \times 3.8 = 15.96$
The product must have the same number of decimal places as those in the factors.

N

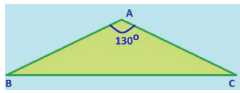
negative integer
-3
(pg. 14)
An integer that is less than zero.

GLOSSARY

nth term 2, 4, 6, 8, ...nth
(pg. 31)
Any term in a sequence.

O

obtuse triangle
(pg. 57)



A triangle with one obtuse angle which is between 90^0 and 180^0 .

open circle
(pg. 37)

The solution of the inequality does not include the number shown on the number line.

opposites -3 and 3
(pg . 19)
Two integers that are the same distance from zero on a number line.

ordered pair (4,8)
(pg. 45)
A pair of numbers used to name a point on the coordinate grid.

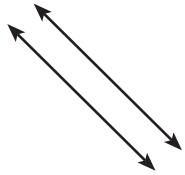
ordering integers
(pg. 14)
Arranging according to some rule.

output
(pg. 45)

The changed number after a function.

P

parallel
(pg. 62)



Straight lines that always stay the same distance apart.

parallelogram
(pg. 62)

A four-sided shape with opposite sides parallel.

position-to-term
(pg. 31)
3, 6, 9, ☐
1st 2nd 3rd 4th
Using the position of a term to find a rule for any term.

positive integer 1, 2, 3, ...
(pg. 14)
An integer that is greater than 0.

GLOSSARY

power $6^2 = 6 \times 6$

(pg. 22)

Tells us how many times to use the base as a factor.

product $3 \times 8 = 24$

(pg. 19)

The answer to a multiplication problem..

Q

quadrilateral

(pg. 57)

Any shape with four straight sides.

quotient $4\overline{)24}$ with 6 above

(pg. 62)

The answerin a division problem.

R

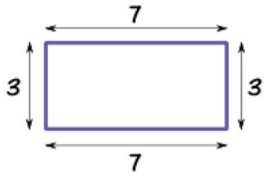
radical sign $\surd$

(pg. 22)

A symbol meaning the root of the number following it.

For example $\surd 81 = 9$

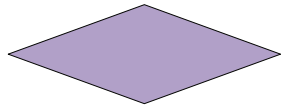
rectangle



(pg. 62)

A quadrilateral with four right angles; opposite sides are equal and parallel.

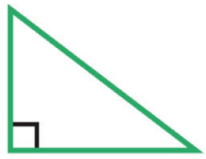
rhombus



(pg. 62)

A parallelogram with four congruent sides.

right triangle



(pg. 57)

A triangle with one right angle.

S

scalene triangle

(pg. 57)

A triangle with no sides or angles the same.

sequence - 4 - 2 0 +2 +4 ...

(pg. 31)

A list of numbers in a special order.

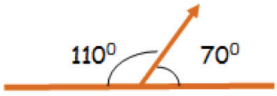
solution of an inequality
(pg. 37)
The answer to an inequality.

squared 4^2 is 4 x 4
(pg. 22)
To use the base as a factor two times.

square root $\sqrt{16} = 4$
(pg. 22)
The number used as a factor two times to give the number inside the radical sign.

subtraction (of decimals)
$$\begin{array}{r} 3.96 \\ -\ 1.42 \\ \hline 2.54 \end{array}$$
(pg. 10)
To subtract decimals just line up the points and subtract.

supplementary angles
(pg. 48)

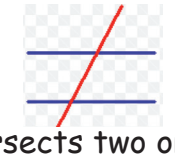


Two angles that add upto 1800

T

term
(pg. 27, 31)
0, 2, 4, 6, 8... or $2x + 3 - y$
Each number in a sequence.In algebra: A single number or a variable, or numbers and variables multiplied together in an expression.

term-to-term
(pg. 31)
Using the difference between two terms to find the next term in a sequence.

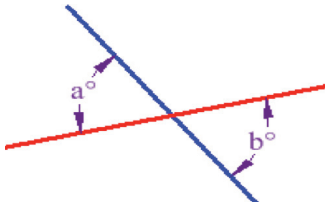
transversal

(pg. 53)
A line that intersects two or more other lines.

V

variable $3 + a = 7.$
(pg. 27)
A letter that takes the place of an unknown number.

vertically opposite angles

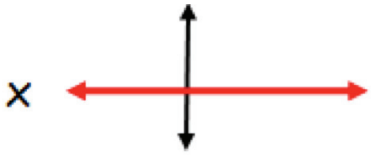
(pg. 53)



Two angles that are opposite and equal to each other.

X

x-axis



(pg. 42)

A horizontal line on a coordinate plane that goes through zero.

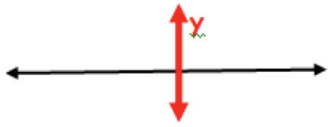
x-coordinate (x,y) (4,6)

(pg. 42)

The first number in an ordered pair.

Y

y-axis



(pg. 42)

A vertical line on a coordinate plane that goes through zero.

y-coordinate (x,y) (4,6)

(pg. 42)

The second number in an ordered pair.

SCIENTIFIC ENGLISH

SCIENCE

GRADE 7

GRADE 6 REVIEW

TODAY'S SCIENCE KEYWORDS

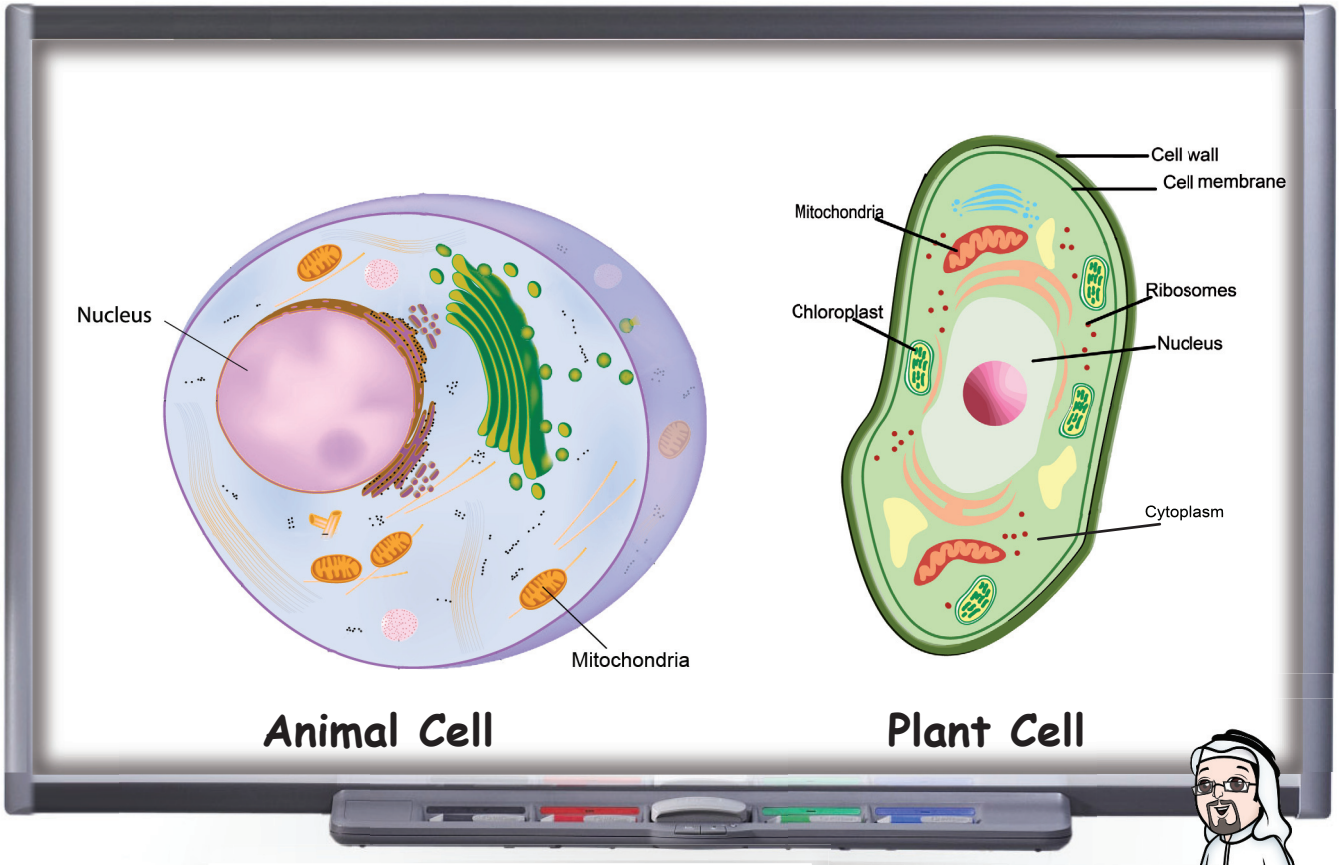
Look at the keywords column in the table below (from Grade 6). Rewrite each word in the next column. Next to the word write its meaning, and in the last box draw a picture or give an example. The first one is done for you!

KEYWORD	REWRITE	MEANING	PICTURE or EXAMPLE
Molars		Type of teeth at back of mouth used for crushing and grinding food	
Esophagus			
Reversible change			

KEYWORD	REWRITE	MEANING	PICTURE or EXAMPLE
Irreversible change			
Evaporation			
Spectrum			
Gravity			

SPECIALISED CELLS 1

KEYWORDS: cell organelle, cell membrane, cell wall, nucleus, chloroplast, mitochondria



Sir, can you tell us about cell organelles?

A **cell organelle** is a special part of the cell that has a special job. There are many organelles. Look at the board and tell me about them.

The **cell wall** protects the cell. The **cell membrane** lets materials in and out. Animal cells do not have a cell wall.

The **nucleus** controls activity in the cell. The **mitochondria** make energy for the cell.

Only plant cells have **chloroplasts**. Chloroplasts use energy from the sun to make food for the plant.

Task 1:

Draw lines to match the two parts of the sentences.

1 The nucleus	a) is part of the cell that has a special job.
2 The cell wall	b) controls activity in the cell.
3 A cell organelle	c) lets things in and out.
4 The mitochondria	d) make energy for the cell.
5 The cell membrane	e) protects the cell.
6 Chloroplasts	f) make food for the plant.

Task 2:

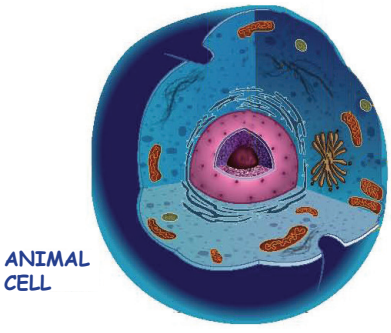
Work with your partner and correct the underlined words.

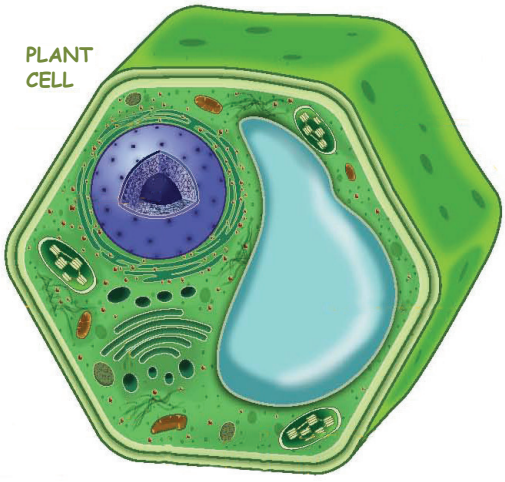
1 The ~~cell wall~~ is the control centre of the cell.

2 The ~~chloroplasts~~ protect the cell.

3 The ~~nucleus~~ makes energy for the cell.

4 ~~Mitochondria~~ make food for the plant.





Task 3:

Use the words from the box below to complete the sentences.

food	organelle	energy	cell membrane	chloroplast

1. The ..... controls what passes in and out of the cell.
2. Chloroplasts take the sun's energy to make ..... for the plant.
3. Only plant cells have a ..... .
4. The mitochondria make ..... .

Task 4:

Choose the correct answer. Is it a, b or c ?

1. The ..... protects the cell.
   a) nucleus b) cell wall c) mitochondria
2. Water, carbon dioxide and oxygen go through the ..... .
   a) chloroplast b) mitochondria c) cell membrane
3. The ..... controls what happens inside the cell.
   a) cell wall b) mitochondria c) nucleus
4. An animal cell doesn't have a ..... .
   a) cell wall b) nucleus c) cell membrane

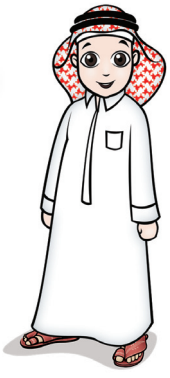
Task 5:

Play this game with your partner and ask the following questions.

Don't forget to take turns.

I make energy for the cell. What am I?

I control activity in the cell. What am I?



I am a special part of the cell with a special job. What am I?

I protect the cell but you will not find me in animal cell. What am I?

I make food for the plant. What am I?

Task 6: PUZZLE TIME!

Fill in the puzzle.

Across

4) The cell ..... lets things in and out.

5) The cell ..... protects the cell.

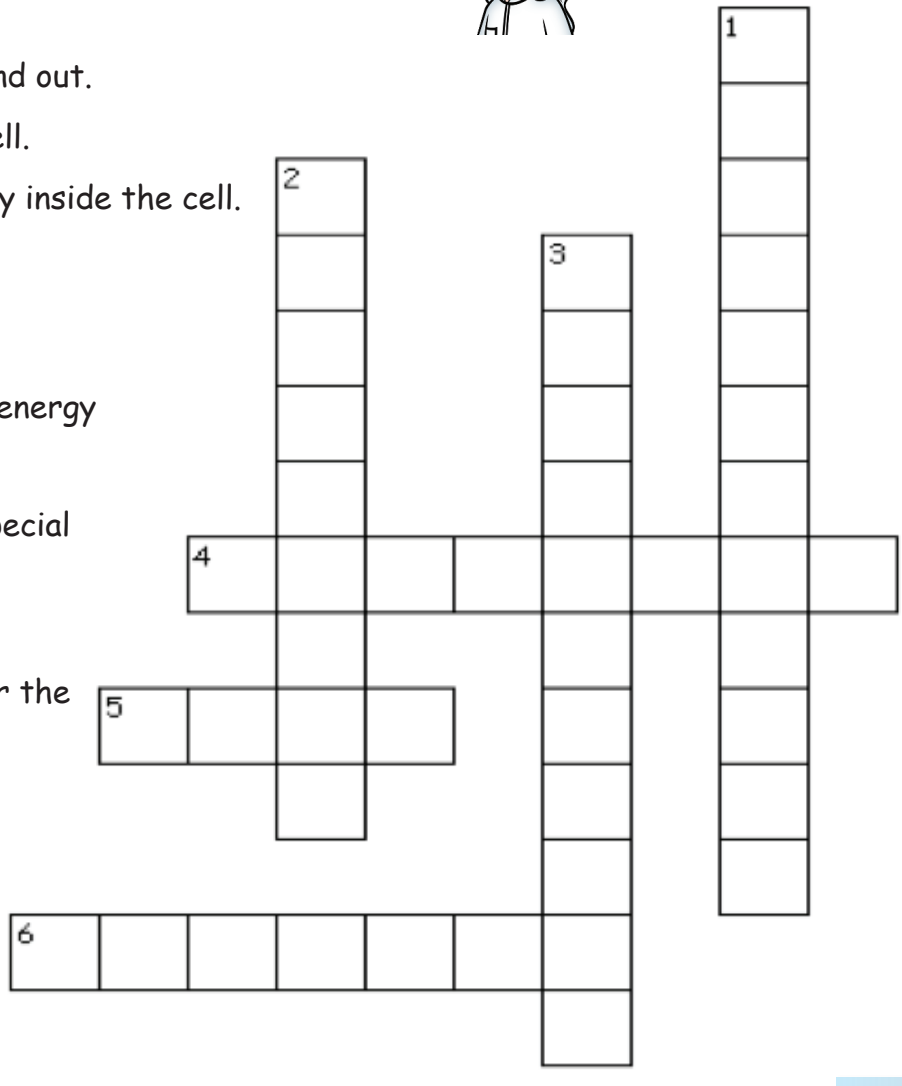
6) The ..... controls activity inside the cell.

Down

1) The ..... make energy for the cell.

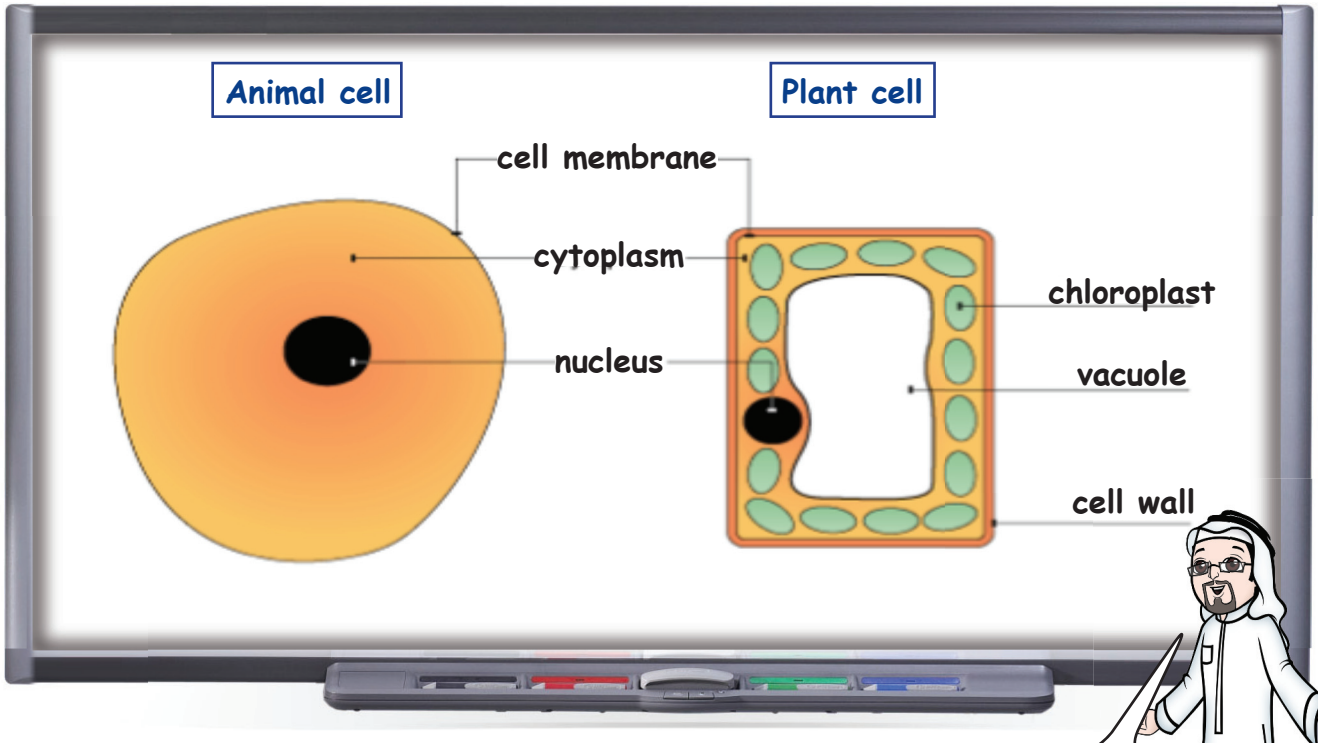
2) A cell ..... is a special part of the cell with a special job.

3) A ..... makes food for the plant.



SPECIALISED CELLS 2

KEYWORDS: cytoplasm nucleus chloroplast vacuole chlorophyll



Look at the cells on the board and tell me what you see.

Ok! I'll start. Plant and animal cells have cytoplasm, a cell membrane and a nucleus. Chemical reactions happen in the **cytoplasm**.

The cell membrane controls what goes into and out of the cell. The **nucleus** controls what happens inside the cell and has information to make a new living thing.

Plant cells have **chloroplasts**. They have **chlorophyll**.

This takes the sun's energy to make food for the plant.

The **vacuole** in plant cells has a liquid made of salt and sugar called cell sap that keeps the cell firm.

The cell wall supports the plant cell and gives it shape.

Task 1:

Match the two parts of the following sentences. Draw lines.

1 The cell membrane	a) keeps the cell firm.
2 Chemical reactions	b) controls what happens inside the cell.
3 The nucleus	c) supports the cell.
4 The vacuole	d) happens in the chloroplasts.
5 The cell wall	e) controls what goes into and out of the cell.
6 Photosynthesis	f) happen in the cytoplasm.

Task 2:

Choose the correct answer. Is it a, b, or c ?

1 You will find ..... , and a nucleus in plant and animal cells.

a) cytoplasm, a cell membrane b) a cell wall, chloroplasts c) vacuole, chloroplasts

2 We call the nucleus the 'brain' of the cell because it ..... what happens in the cell.

a) supports b) makes c) controls

3 ..... contain/s chlorophyll.

a) Sunlight b) Chloroplasts c) The nucleus

4 The liquid inside the ..... is called cell sap.

a) vacuole b) nucleus c) cell wall

5 The cell wall ..... the cell.

a) supports b) makes c) controls

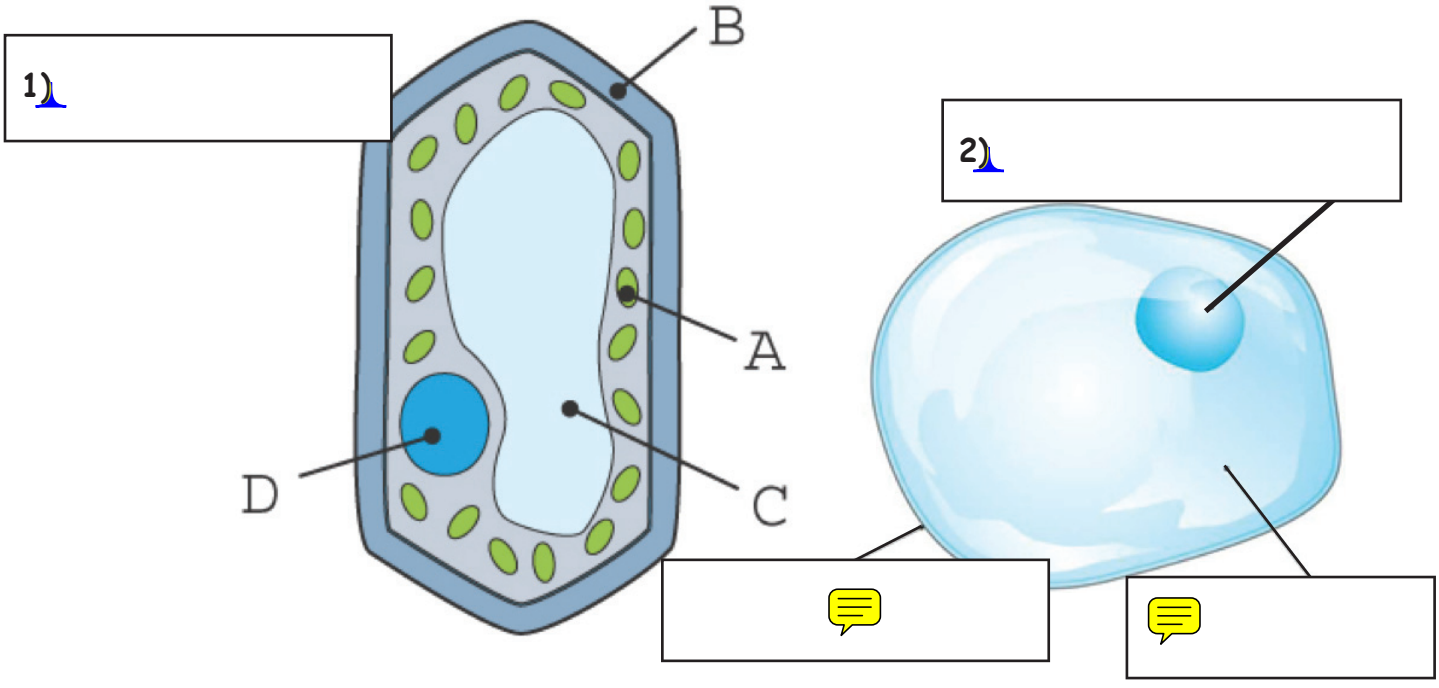
Task 3:

Work with your partner and correct the underlined word in each sentence.

1. **Photosynthesis** happens inside the **nucleus**. .....
2. Liquid in the vacuole is made of sugar and **chlorophyll**. .....
3. The ~~**vacuole**~~ gives the plant cell shape. .....
4. The ~~**chloroplast**~~ has information to make new living cells. .....
5. Only plant cells have chloroplast, a cell wall and a **cell membrane**. .....

Task 4:

Label the following diagrams: write in the boxes!



Write the labels for diagram 1 here.

A	
B	
C	
D	

Task 5:

Find the following words in the wordsearch below:

N	K	D	G	Y	Z	C	V	F	J	J	T	X	Q	O
W	U	F	G	F	L	Z	U	J	Z	B	S	Y	A	Y
M	Y	C	O	G	C	M	T	G	P	Z	A	P	V	W
O	V	Y	L	G	D	C	S	O	M	L	L	J	A	E
W	Z	X	L	E	L	H	D	M	L	J	P	V	C	E
A	E	J	S	Y	U	Z	H	Y	F	Y	O	R	O	L
I	F	L	U	L	O	S	H	O	C	Q	R	V	U	L
V	V	C	Y	T	O	P	L	A	S	M	O	J	L	S
K	C	Y	B	O	O	L	S	Q	F	M	L	S	E	J
G	X	F	B	R	W	L	U	X	W	Y	H	E	K	M
X	V	E	O	K	V	G	I	S	P	B	C	B	Q	Z
V	E	L	A	Q	Q	L	K	H	N	N	F	Z	I	S
E	H	V	U	P	B	W	V	C	P	F	G	V	S	K
C	L	K	Y	C	L	J	E	Y	K	G	P	S	A	Q
X	T	M	W	R	M	M	R	E	K	N	H	I	G	O

CHLOROPHYLL
CHLOROPLAST
CYTOPLASM
NUCLEUS
VACOULE

Task 6:

Play this game with a partner. Ask your partner the following questions.

I support the cell and give it shape. What am I?

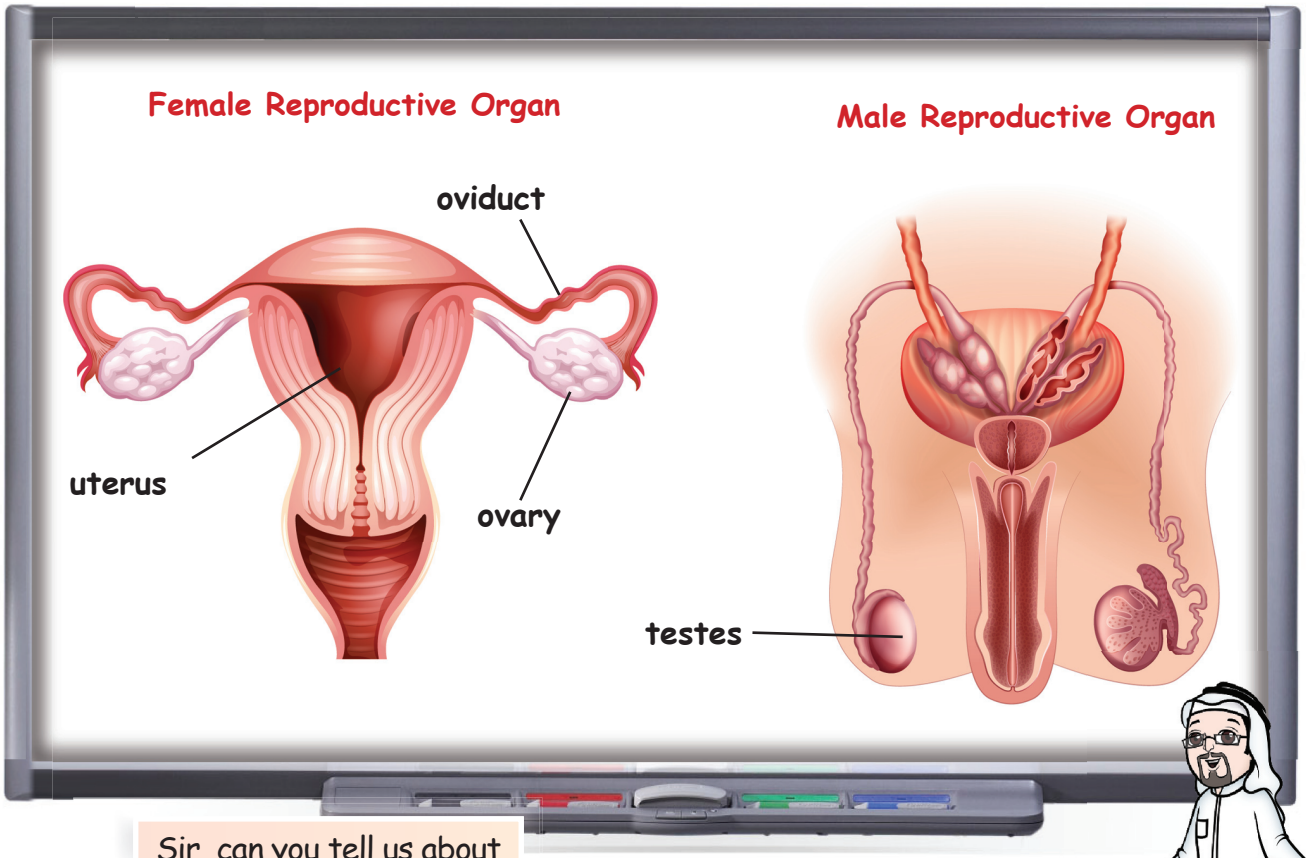
Chemical reactions take place inside me. What am I?

I control everything inside the cell. What am I?

I have a mixture of salt and sugar called cell sap. What am I?

HUMAN REPRODUCTION 1

KEYWORDS: fertilisation, oviduct, ovary, uterus, testes, embryo, foetus



Sir, can you tell us about human reproduction?

Fertilisation happens when the male and the female sex cells join. The male has two **testes** that make male sex cells. The female has two **ovaries** that make and keep her egg cells.

The male cells go into the **uterus** where one male cell joins with the female cell. The female cell is fertilised and divides into a ball of cells called an **embryo**.

The embryo becomes a **foetus** and then a baby. That's how humans reproduce.

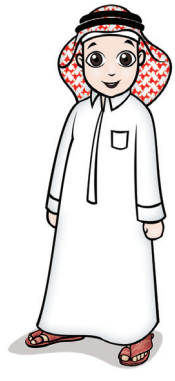
Task 1:

Match the two parts of the sentences. Draw lines.

1	Fertilisation happens	a)	divides to become an embryo.
2	The testes	b)	join in the uterus.
3	The ovaries	c)	becomes a foetus.
4	A fertilised cell	d)	when a male and female sex cell join.
5	The embryo	e)	make male sex cells.
6	The male and female cells	f)	make and keep female sex cells.

Task 2:

Choose the correct answer. Is it a, b, or c?



1. The male has two ..... .
   a) eggs b) testes c) embryos
2. Egg cells are in the ..... .
   a) ovaries b) testes c) kidneys
3. Fertilisation happens in the ..... .
   a) uterus b) testes c) testis
4. The fertilised cell divides into many cells called a/an ..... .
   a) foetus b) embryo c) ovary
5. The ..... becomes a baby.
   a) foetus b) ovaries c) testis

Task 3: **Work with a partner. Choose a word from the box below to complete the paragraph.**

uterus embryo (x2) testes foetus ovaries

The (1) ..... make male sex cells. The (2) ..... keep the egg cells. The male cell joins with the egg cell in the (3) ..... . The egg cell is fertilised here and divides into many cells called the (4) ..... . The (5) ..... becomes a (6) ..... and later a baby.

Task 4: **PUZZLE TIME!**

Fill in the puzzle.

Across

4) A fertilised cell divides to become a/an ..... .

5) Male and female cells join in the ..... .

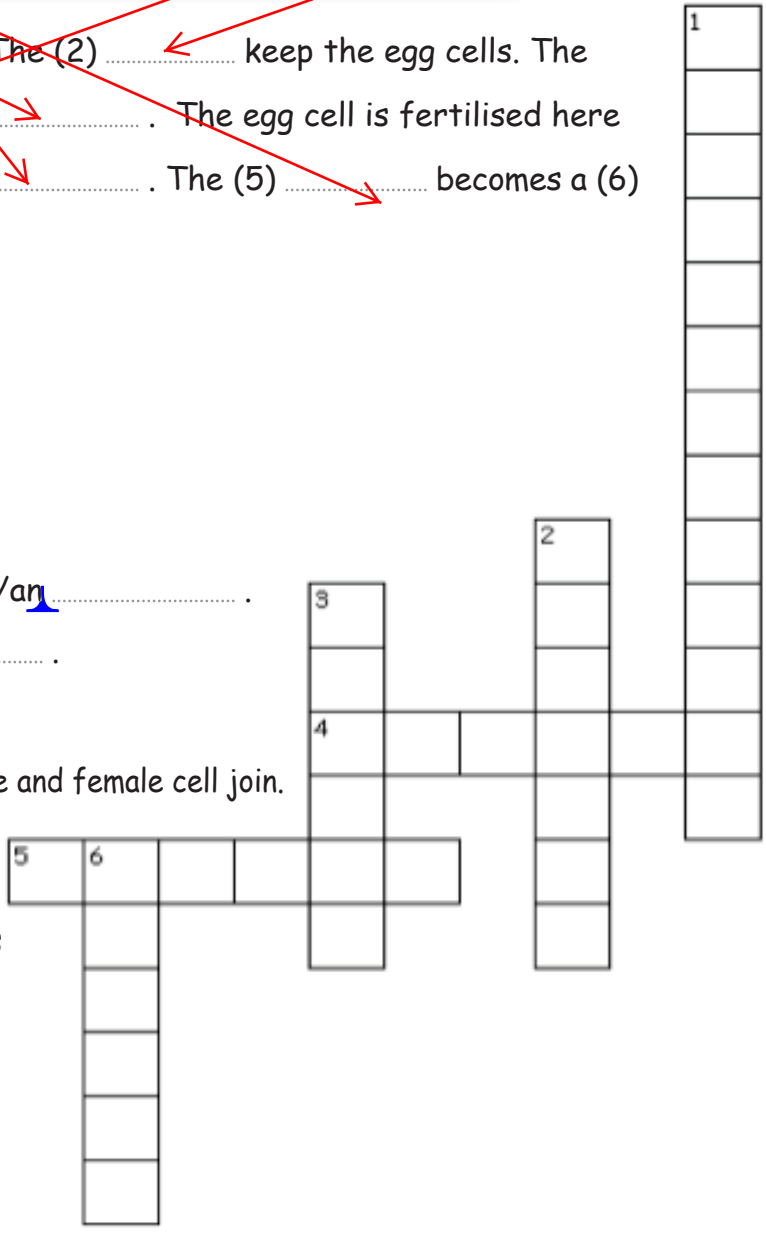
Down

1) ..... happens when the male and female cell join.

2) ..... keep egg cells.

3) The ..... becomes a baby.

6) ..... make male sex cells



Task 5:

Work in pairs.

Ask your partner to answer the following questions.

What keeps the female egg cell?

What does an embryo become?

What does a fertilized cell become?

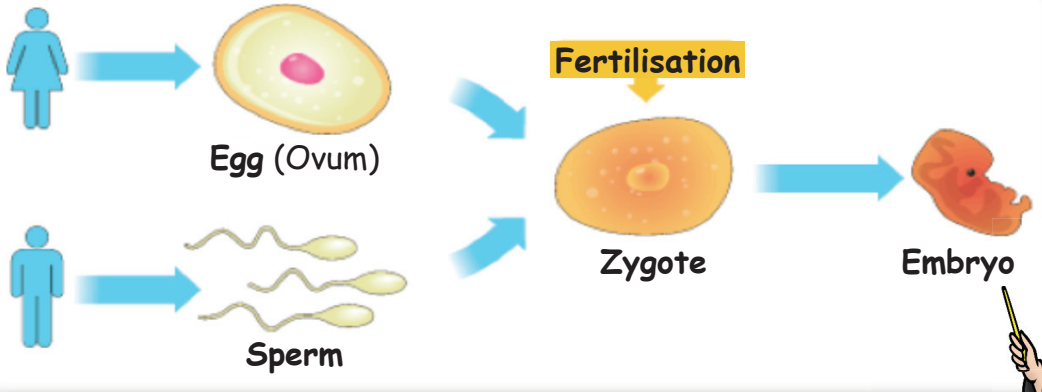
Where does fertilization happen?

What makes male sex cells?

HUMAN REPRODUCTION 2

KEYWORDS: gametes umbilical cord placenta amniotic fluid ovulation

Organisms have sex cells called **gametes**. In human beings, the male sex cells are called sperm and the female sex cells are called eggs, or **ova**. Sexual reproduction happens when a male gamete and a female gamete join. This is called fertilisation!



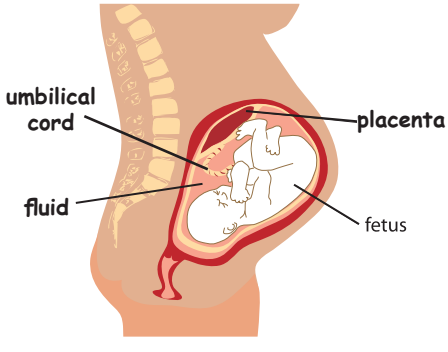
Sir, can you tell us more about human reproduction? What happens after fertilisation?

Ok...Let's start from the beginning!

As you know an egg cell is produced about once a month by the female. This is called **ovulation**. Fertilization may take place in the **oviduct**. After this an embryo is formed. As it grows, it is called a foetus.

As you can see in the diagram, the baby is in a fluid-filled sac, The liquid is called the **amniotic fluid**.

Ah! Ok I get it! This joining of **gametes** is called fertilisation. Ok, what about the EMBRYO? How does it survive?



The embryo is looked after by the **placenta**. It is an organ that allows food uptake, waste to go out, and gas exchange via the mother's blood supply. The **umbilical cord** is the tube that connects the baby and the placenta.

The womb, also called a uterus, protects the baby from pressure inside and from outside. It is a strong muscle.

Task 1:

Use the words from the box below to complete the following sentences:

day, week, embryo, oviduct, uterus, month, ovary, foetus, womb, amniotic fluid

1. Egg cells are produced at the rate of about one every ..... .
2. Fertilisation may happen while the egg is in the ..... .
3. Just after fertilisation, an ..... is formed.
4. Later in pregnancy the developing baby is called a ..... .
5. The foetus is surrounded by a liquid called ..... .

Task 2:

Match the questions on the left with their correct answers.

QUESTIONS	ANSWERS
1. What is fertilisation?	a) Once a month
2. Where is the sperm produced?	b) In the ovaries
3. Where are the eggs produced?	c) When the nucleus of a sperm joins with the nucleus of an egg
4. How often are egg cells released by the ovaries?	d) In the testes
5. Where does fertilisation normally take place?	e) In the oviduct.

VARIATION 1

KEYWORDS: variation characteristics inherited variation environmental variation

Discuss the inherited variation in theses faces!

Environmental variation

Hello, Sir. Can you tell us about variation?

Variation is the way living things look different from each other.
We all have different **characteristics**.

What are **characteristics**?

They show how things are different from others. They show how things look and act differently. Look at the board and tell me about inherited variation and environmental variation?

Inherited variation is the group of characteristics we get from our parents. Brothers look different because they inherit different genes from their parents.

Environmental variation is the surroundings that make living things look and behave differently.

Task 1:

Match the characteristics with their suitable descriptions. Draw lines.

1. Environmental variation
2. Inherited variation

a) We look a little like our father and a little like our mother.

b) I speak English and my brother speaks Arabic.

c) Different genes make us look different.

d) Things around us make us behave and look different.

Task 2:

Look at the photo of identical twins Jane (left), and Susan (right). Susan smokes but Jane doesn't. Susan also loves the sun.

Smoking, stress and the sun change the way we look.

Choose the correct answer to complete the sentences below.

1. The twins look different from when they were born because of

.....(inherited variation/ environmental variation)

2. The twins look different at the age of 61 because of .....

(inherited variation/ environmental variation)

Task 3:

Answer the following questions.

1. Are children always the same as their parents?

.....

2. Are two brothers always the same?

.....

3. Do identical twins look the same when they get older?

.....

4. Are identical twins the same at birth?

.....

5. Are identical twins the same after 20 years? Why? Why not?

.....

Task 4:

Ask a partner the following questions.

1. What is variation?
2. What is inherited variation?
3. What are characteristics?
4. What is environmental variation?

VARIATION 2

KEYWORDS: generation selective breeding desirable characteristics

BULLDOG

fast, will fight

MASTIFF

big, strong, good friend, no speed, won't fight

BULLMASTIFF

big, fast and quick, strong, will fight

Sir, can you tell us more about variation?

Yes, let's start with **desirable** characteristics. **Characteristics** are things that make you different. **Desirable** is something you want. **Desirable characteristics** are things you want. These **characteristics** are good and useful. Do you know anything about selective breeding?

Selective breeding is when we choose organisms so that the new organism has the characteristics you want. Farmers do this to get the best animal.

I see. So they intervene or get involved or step in so that the next generation of animals will have the characteristics they want.

What is a generation?

This is when children grow up and give birth. They're called the next **generation**.

Task 1:

Match the two parts of the following sentences

1	Desirable characteristics	a)	is choosing two organisms so that the new organism will have the characteristics you want.
2	The next generation	b)	means 'something you want'.
3	Characteristics	c)	is the children who grow up to have new children.
4	Selective breeding	d)	are useful things you want that will make you different.
5	Desirable	e)	are things that make you different.

Task 2:

Use the words below to complete the sentences.

desirable generation characteristics

..... characteristics are good and useful things you want in the next ..... . To get this, you intervene and breed selectively so that the next generation will have those ..... .

Task 3:

Choose the correct word from the box below and fill in the blanks.

selecting desirable characteristics selective breeding characteristics generation

In the 1800s, bird hunters wanted a dog that would be different, They used ..... to breed a dog that had all the ..... they wanted. People made a different dog by ..... and breeding a mastiff and a bulldog. They a produced a different ..... of dogs called bullmastiffs.

Task 4:

Put the steps for selective breeding in the correct order.
Write the number in the box. Work with a partner.

You want a cow that makes a lot of milk.

	Now let the new generation of cows that make lots of milk mate.
	Do this again and again until you get what you want.
1	Select cows that give a lot of milk.
	Let only those cows reproduce.
	In the next generation, select only the cows that give a lot of milk.

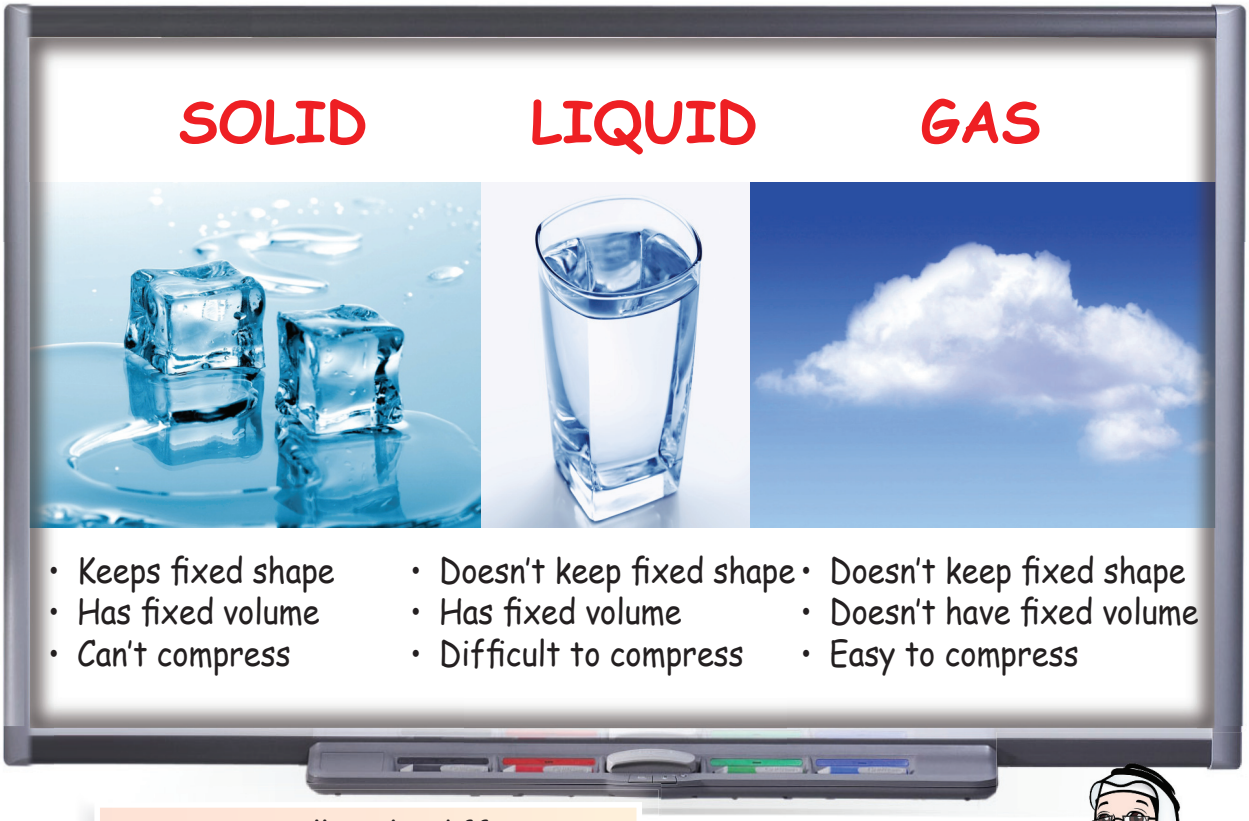
Task 5:

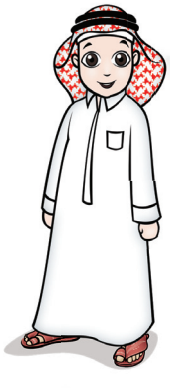
Discuss with your partner what you would do with hens to lay big eggs. Use these words.

1. Select
2. Choose
3. Breed

LIQUIDS, SOLIDS AND GASES 1

KEYWORDS: solid liquid gas volume particles





Sir, can you tell us the difference between a solid, a liquid and a gas?

Yes, but first let's look at words we use to explain them. Fixed **volume** is the amount of space something takes which does not change. **Particles** are so small, we can't see them, but everything we see is made of them. Compress means to push together. Now, look at the board and tell me about solids, liquids and gases.

Solids keep their shape and volume. You can't compress them.

Liquids can flow because their particles slide over one another. They keep their volume but take the shape of the container.

Gases take the shape and volume of the container they're in. They're easy to compress.

Task 1:

Complete the sentences by matching the two parts. Draw lines.

1	Compress	a)	are so small that can't see them.
2	Volume	b)	keep their shape and volume.
3	Particles	c)	keep their volume but not their shape.
4	Solids	d)	means to push together.
5	Liquids	e)	take the shape and volume of the container they're in.
6	Gases	f)	is the amount of space something takes.

Task 2:

Use the words from the box below and fill in the blanks.

solids liquids gases

1. You can't compress ..... .
2. ..... and ..... take the shape of the container they're in.
3. ..... and ..... have fixed volume.
4. ..... and ..... don't keep their shape.
5. ..... are easy to compress.

Task 3:

Choose the correct answer. Is it a, b, or c?

1. Liquids have ..... and ..... .

   a) shape, fixed volume b) fixed volume, no shape c) no fixed volume, shape

2. Solids have ..... and ..... .

   a) shape, fixed volume b) no fixed volume, shape c) no shape, fixed volume

3. Gases have ..... and ..... .

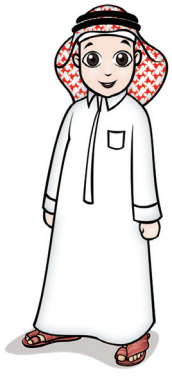
   a) no shape, fixed volume b) no fixed volume, shape c) no shape, no fixed volume

Task 4:

Play this game with your partner. Ask your partner the following questions. Don't forget to take turns.

I have volume but no shape. What am I?

You can easily compress me. What am I?



I have shape and volume. What am I?

You can't compress me. What am I?

I have no shape and no volume. What am I?

Task 5: PUZZLE TIME!

Fill in the puzzle.

Across

4) ..... are so small we cannot see them.

6) .... is the amount of space something takes.

Down

1) ..... means to push together.

2) ..... keep their volume and shape.

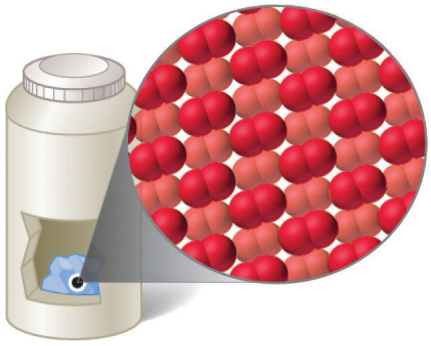
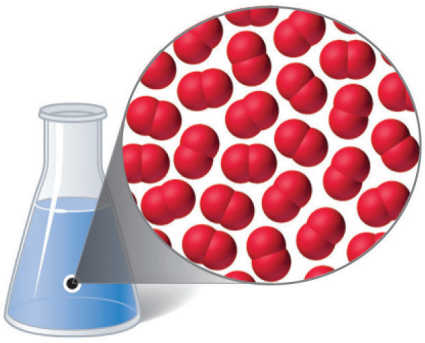
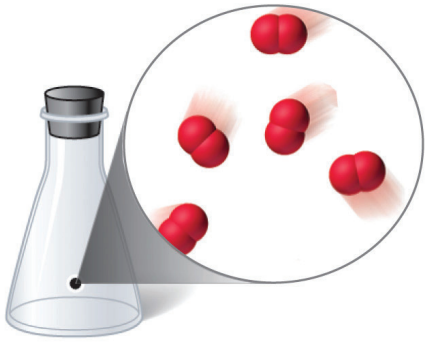
3) ..... does not have fixed volume or fixed shape.

5) ..... takes the shape and volume of its container.

Task 6:

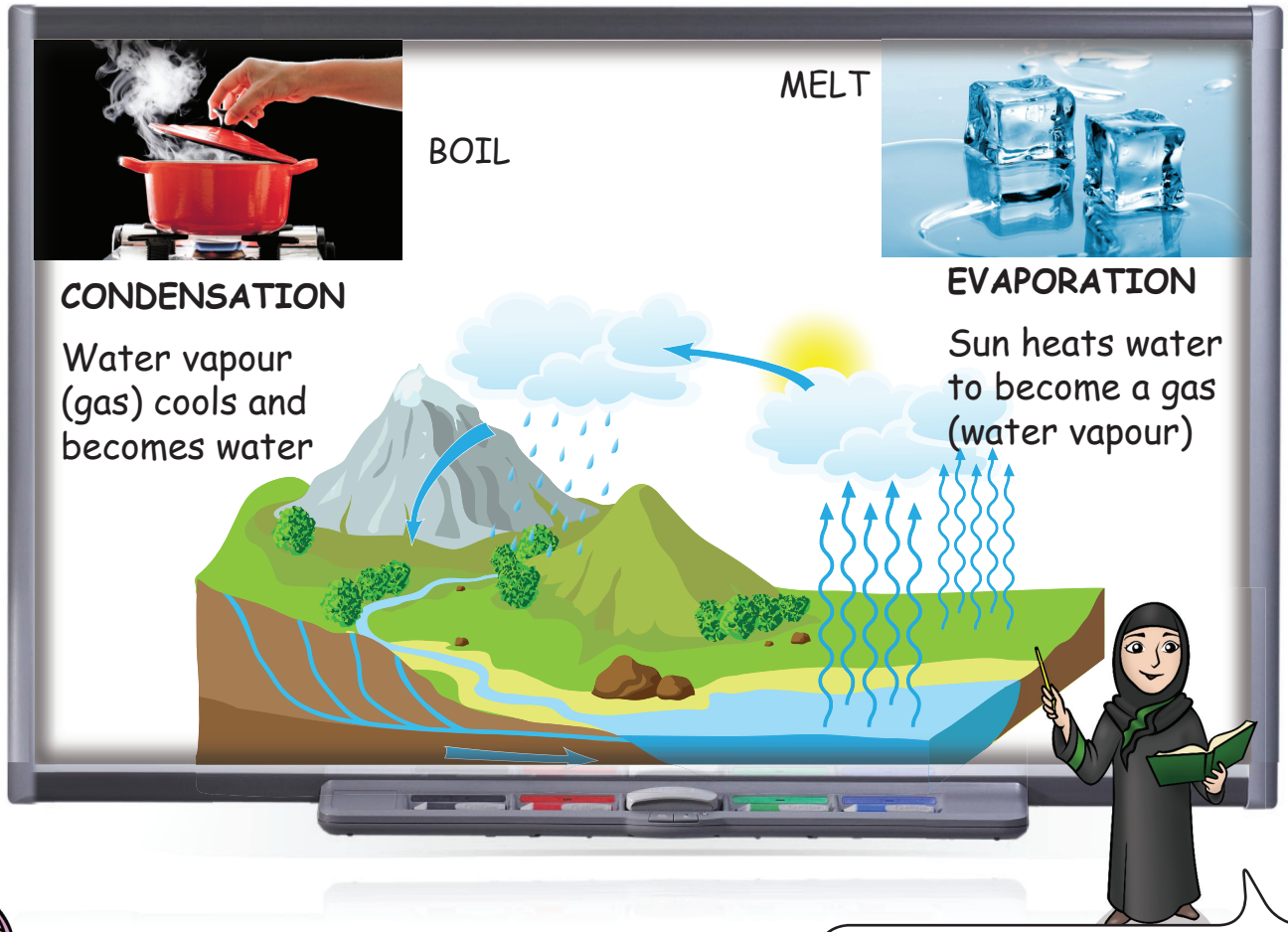
Look at the particle models in the table. Explain what each one is and describe the particles. Use the following words for each type.

Particle , fixed volume , solid, liquid , gas , compress , shape

	solid	particles close, fixed volume, fixed shape...cannot compress
	liquid	
	gas	

LIQUIDS, SOLIDS AND GASES 2

KEYWORDS: freeze melt boil condense evaporate



To **melt** is to change a solid to a liquid by increasing the temperature.

To **boil** is to heat a liquid until bubbles appear.

To **freeze** is to change a liquid into a solid by lowering the temperature.

Today we are going to talk about changes of state. You remember that there are three states of matter: liquids, solids and gas. Can you tell me how they change?

To **condense** means to change from a gas to a liquid by cooling.

To **evaporate** means to change from a liquid to a gas by heating.

Task 1:

Match the two parts of the following sentences. Draw lines.

1	Boiling is when	a)	gas cools down to become a liquid.
2	Condensation is when	b)	liquid becomes a gas because of heating.
3	Melting is when a	c)	changing from a liquid to a solid by cooling.
4	Evaporation is when a	d)	you heat a liquid until you see bubbles.
5	Freezing is	e)	solid becomes a liquid after increasing the temperature.

Task 2:

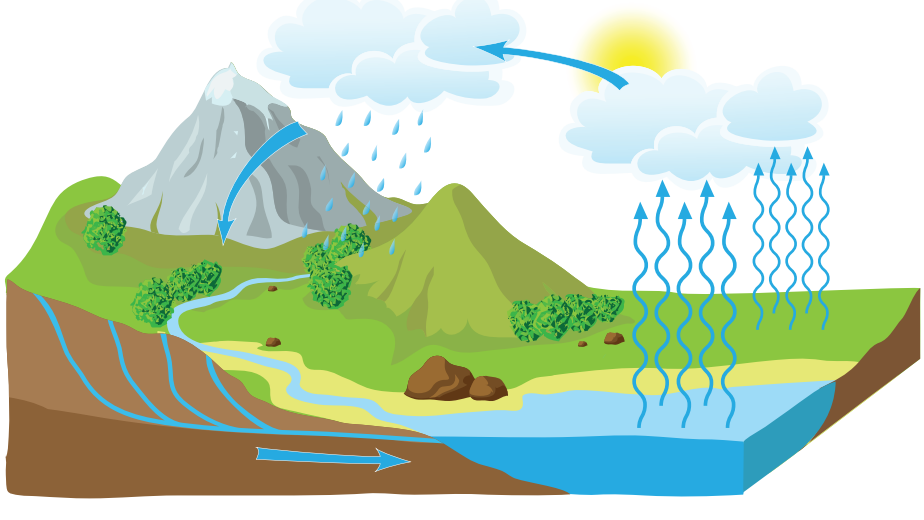
Use the words from the box below and fill in the blanks.

gas	condensation	sun	evaporation	water

1 The ..... heats the water and it becomes a ..... .
This is ..... .

2 The gas rises into the air and cools down. Now the gas changes back into ..... .

3 This is ..... .



Task 3: **Choose the correct answer. Is it a, b, or c?**

1. Melting is changing from a ..... by heating.
   a) solid to a gas b) solid to a liquid c) liquid to a gas
2. Freezing is changing from a ..... by cooling.
   a) solid to a gas b) solid to a liquid c) liquid to a solid
3. Condensation is changing from a ..... by cooling.
   a) gas to a liquid b) liquid to a gas c) solid to a gas
4. ..... is heating a liquid until it bubbles.
   a) Freezing b) Melting c) Boiling
5. Evaporation is changing from a ..... by heating.
   a) solid to a gas b) solid to a liquid c) liquid to a gas

Task 4: **Correct the <u>underlined</u> word in each sentence. Work with a partner.**

1. Water vapour is a <u>solid</u>. .....
2. Water is a ~~<u>gas</u>~~. .....
3. Ice is a ~~<u>liquid</u>~~. .....
4. Evaporation is the opposite of ~~<u>boiling</u>~~. .....
5. Melting is the opposite of ~~<u>condensation</u>~~. .....

Task 5: **Ask your partner to answer the following questions.**

What is boiling?

What is evaporation?

What is freezing?

What is melting?

What is condensation?

GAS, PRESSURE AND DIFFUSION

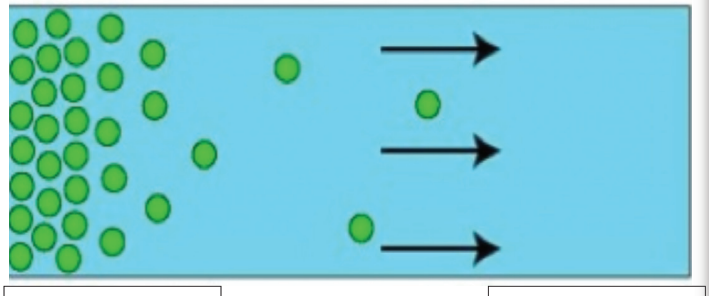
KEYWORDS: diffusion expand contract gas pressure concentration

DIFFUSION

When the ball is heated, it will not go through the ring; the ball expands.

A heated ball won't go through the ring. The ball expanded.

Gas Pressure



Today we are going to talk about gas pressure and diffusion.

Do you know anything about them? Look at the board and tell me.

Gas pressure is the force of a gas against the side of a container.

Diffusion is when gases move from a place of high concentration to a place of low concentration.

I know. **Concentration** is the amount of a substance in a space. The concentration of a gas is the number of gas molecules in a space.

One more question. What do the words expand, and contract mean?

What is concentration?

Expand means to make bigger and **contract** means to make smaller.

When particles get hot, they move more and expansion takes place. When they cool down, they move less and this is called contraction.

Task 1: **Match the two parts of the sentences.**

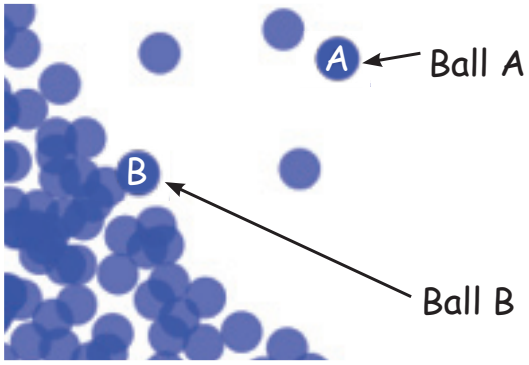
1	The concentration of a gas	a)	is a gas pushing against the side of a container.
2	Gas pressure	b)	moves from a place of high concentration to a place of lower concentration.
3	Expand	c)	means to make smaller.
4	Diffusion is when a gas	d)	is the number of gas molecules in an area.
5	Contract	e)	means to make bigger

Task 2: **Choose the correct word from the box below and fill in the blanks.**

lower diffusion smaller higher bigger

1. If you put a red paint brush into a glass of water, the water will turn red. This is because of ..... .
2. Gases move from places of ..... concentration to places of ..... concentration.
3. To expand means to make .....
4. To contract means to make ..... .

Task 3: **Discuss this question with a partner and write your answer on the line.**



Does ball A move to ball B, or does ball B move to ball A? Why?

What do we call this process?

.....

.....

.....

Task 4:

Choose the correct answer. Is it a, b, or c?

1. ..... is the force of a gas against the walls of a container.
   a) Expansion **b)** Concentration **c)** Gas pressure

2. If you force a lot of gas into a small container, the gas pressure will ..... .
   a) increase **b)** decrease **c)** concentrate

3. A high concentration of gas means a lot of molecules in a ..... space.
   a) big **b)** small **c)** medium

4. If you open a bottle of perfume in a room, the whole room will smell.
   This is because of ..... .
   a) diffusion **b)** gas pressure **c)** concentration

Task 5:

Ask your partner the following questions.

What is diffusion?

What does contract mean?

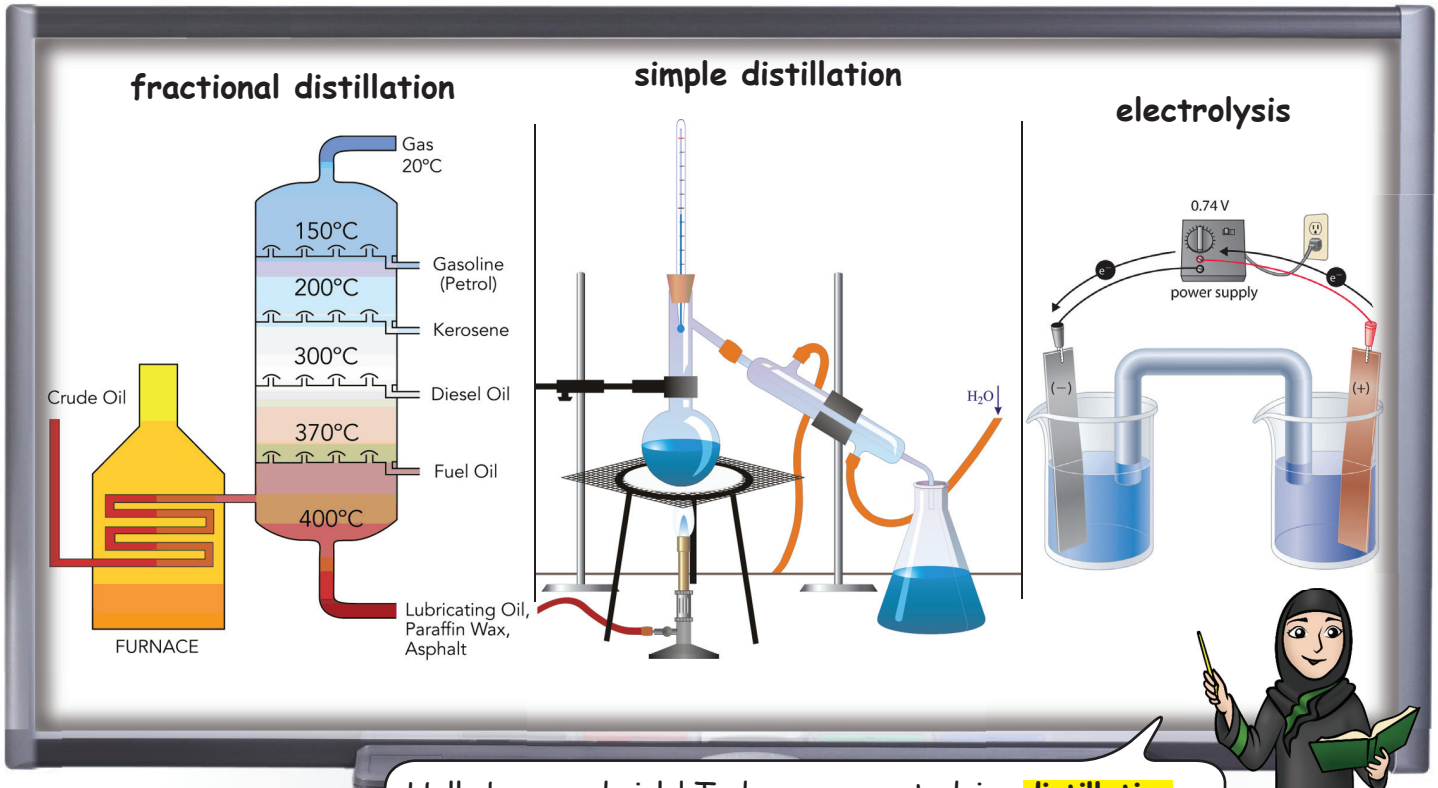
What does expand mean?

What does concentration of gas mean?

What is gas pressure?

PHYSICAL AND CHEMICAL CHANGES

KEYWORDS: distillation simple distillation fractional distillation electrolysis electrolyte electrode



Hello boys and girls! Today, we are studying **distillation** and **electrolysis**. **Distillation** is a process that uses heat to separate substances. Now look at the board.

Good! Now tell me about electrolysis.

Electrolysis is a process where we split or break apart things like liquids or compounds using electricity.

An **electrolyte** is a solution that allows electricity to pass through it.

An **electrode** is a conductor through which an electric current enters or leaves a substance.

In **simple distillation**, the liquids have a big difference in boiling point. There is only one distillation process and one product.

In **fractional distillation**, the liquids have a small difference in boiling point. There are at least two distillation processes and more than one product.

Task 1: Match the two parts of the sentences.

1. A solution that lets electricity go through it is an
2. There is a small difference in boiling point in
3. Using heat to separate a substance is called
4. There is a big difference in boiling point in
5. The conductor that lets electricity enter and leave is called an

a) simple distillation.
b) fractional distillation.
c) electrolyte.
d) electrode.
e) distillation.

Task 2:

Choose the correct answer. Is it a, b, or c?

1. Distillation means to ..... substances by heating.
   a) join b) separate c) connect
2. Fractional distillation means distilling ..... .
   a) into many parts b) into one part c) no parts
3. Simple distillation means separating a substance .....
   a) into one part b) into many parts c) one time only
4. In ..... , the difference between the boiling points of the substances is small.
   a) simple distillation b) fractional distillation c) central distillation
5. In ..... , the difference between the boiling points of the substances is big.
   a) simple distillation b) fractional distillation c) central distillation
6. ..... means using electricity to separate things.
   a) Electrolysis b) Electrolyte c) Electrode

Task 3:

Correct the <u>underlined</u> word in each sentence.

1. An ~~electrolysis~~ is a conductor. .....
2. An ~~electrode~~ is a liquid that lets electricity go through it. .....
3. Chemicals can be ~~joined~~ using electrolysis. .....
4. Distillation is using ~~ice~~ to separate substances. .....
5. ~~Only one~~ product is formed in fractional distillation. .....

Task 4: PUZZLE TIME!

Fill in the puzzle.

Across

5) ..... distillation is used to separate liquids with small differences in boiling point.

Down

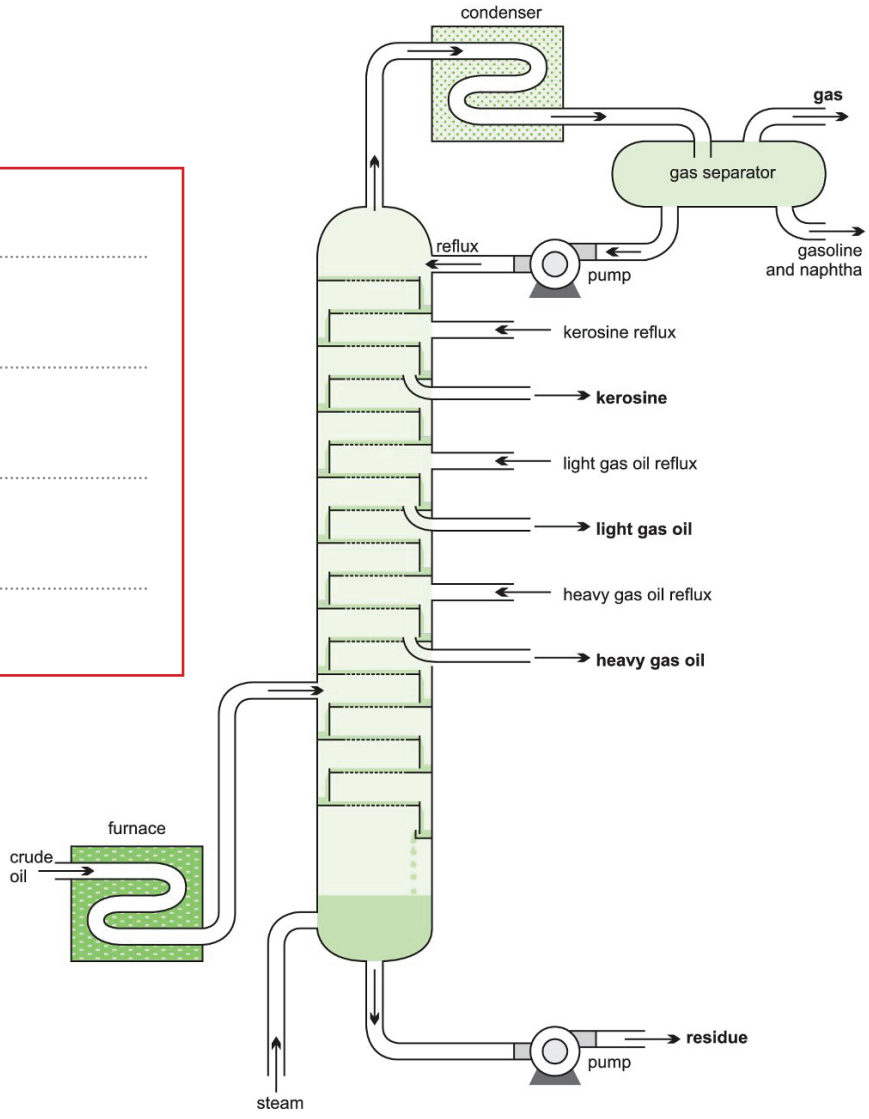
1) ..... electricity can pass through this solution

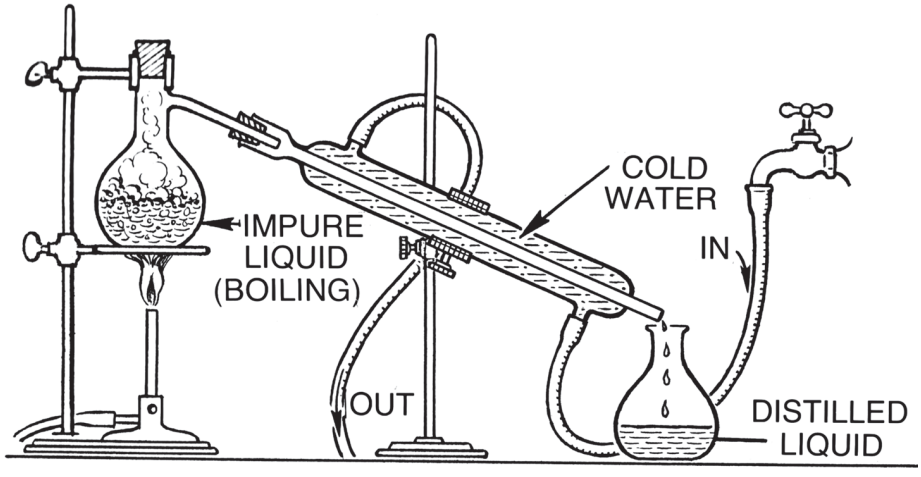
2) ..... is using electricity to break chemicals up

3) ..... distillation is used to separate liquids with big differences in boiling point.

4) An ..... is a conductor that allows electricity to come into and go out of a substance

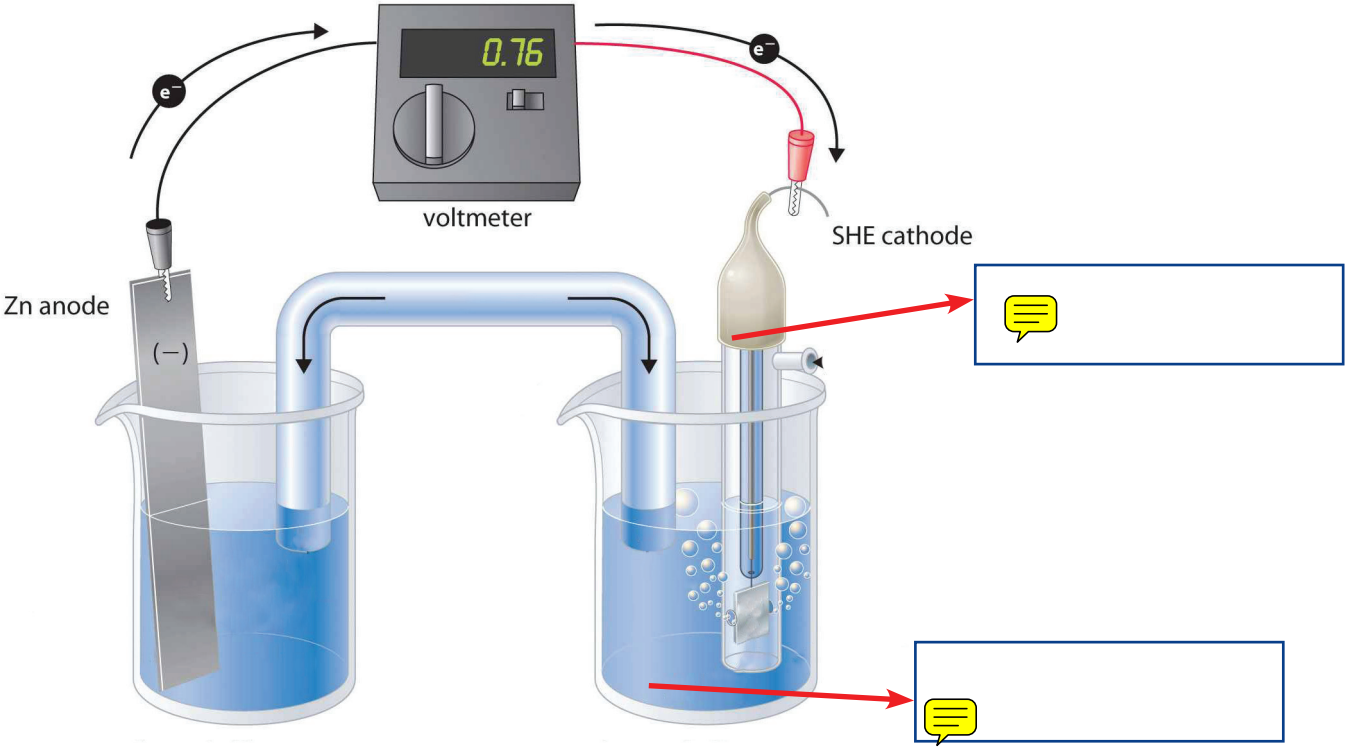
Task 5: **Choose the correct label for the following diagrams.**





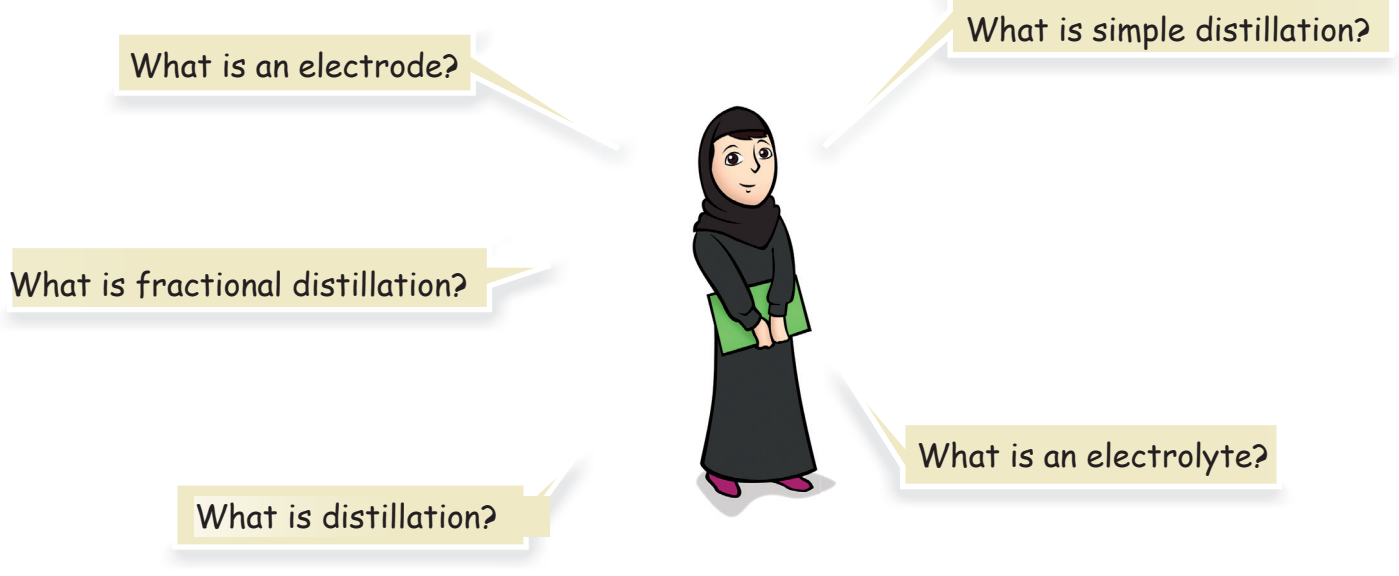
Task 6:

label the parts indicated by the red arrows.



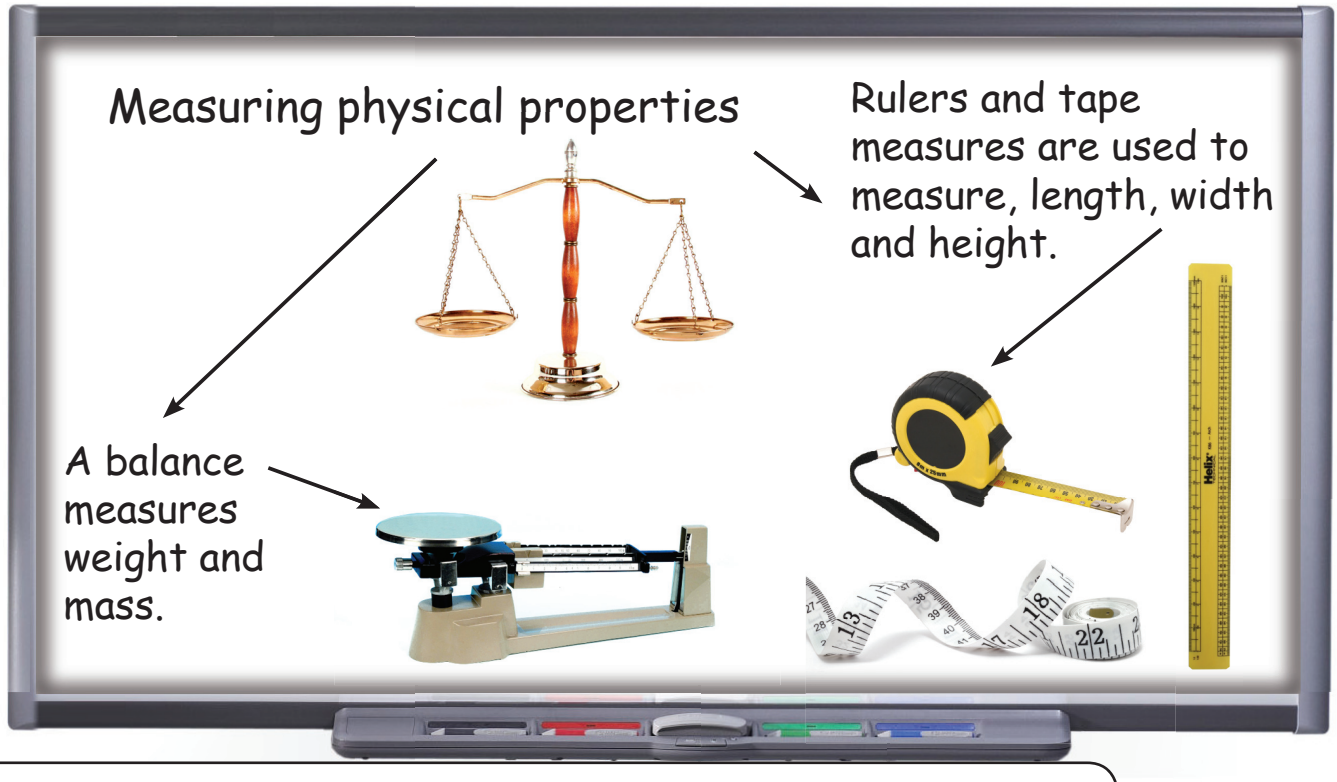
Task 7:

Ask your partner to answer the following questions. Don't forget to take turns.

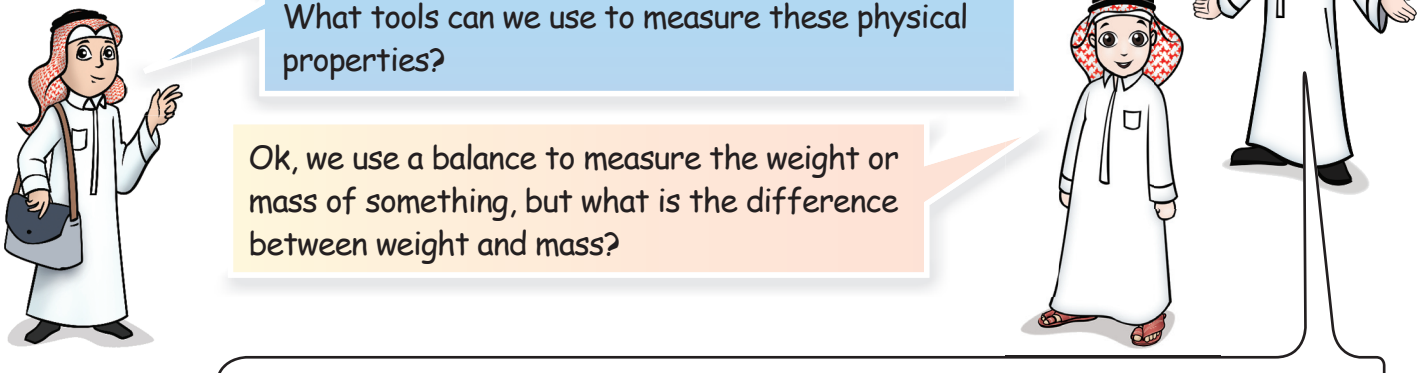


MEASURING AND DENSITY

KEYWORDS: metres, centimetres, grams, kilogram, mass, volume, density, measure



Mass, volume and density are three physical properties of matter. We **measure** these properties using different units. Height and length are measured in **metres** and **centimetres**, and weight is measured in **grams** and **kilograms**. **Density** is the amount of matter in an object compared to the space it takes up. It is measured by the relationship between the object's **mass** and **volume**.



Task 1:

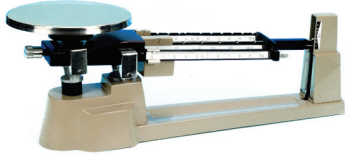
Match the two parts. Draw lines.

1	Mass	a)	is the space that an object takes up.
2	A balance	b)	is a measurement of length.
3	A centimetre	c)	can be measured in kilograms.
4	Volume	d)	measures mass and weight.

Task 2:

Choose the correct word/s to complete the following sentences. Is it a, b, or c?

1. We measure the length of a solid using a .....
   a) balance b) unit c) ruler
2. ..... is the relationship between an object's mass and volume.
   a) density b) weight c) height
3. We can measure ..... in kilograms.
   a) mass b) Weight c) both a and b.
4. We use a ..... to measure mass.
   a) ruler b) balance c) measuring cup



Task 3:

Find the following words in the wordsearch below:

D A U H R N A M O L W G J M N
E E X D Y A E O C R E A Z J H
N R N M C A D R P C C G Z A I
S P B V S D R E M T W H L S S
I Q X U B W B L M H S Z G J Q
T J R S E R T E M U D X O A E
Y E C H L J G Q X O L H E Q O
W X J V C M B K X O I O A O F
O A Y A K Y A L I O N G V H N
F P B Z S S E U H L I P S Z P
B V E Q I Z B E N G O F M D L
C E N T I M E T R E S G A J J
J C S M R O J L C S G L R Z M
I U P D K W W X A L X H G A K
E H S P H E U M M G J C G I M

CENTIMETRES
DENSITY
GRAMS
KILOGRAM
MASS
MEASURE
METRES
VOLUME

Task 4:

Work in pairs. Ask and answer these questions about measurement:

What can a balance measure?

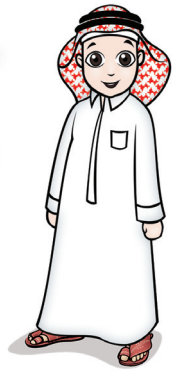
What's mass?

What units do we use to measure length and height?

It can measure...

I know that! It's ....

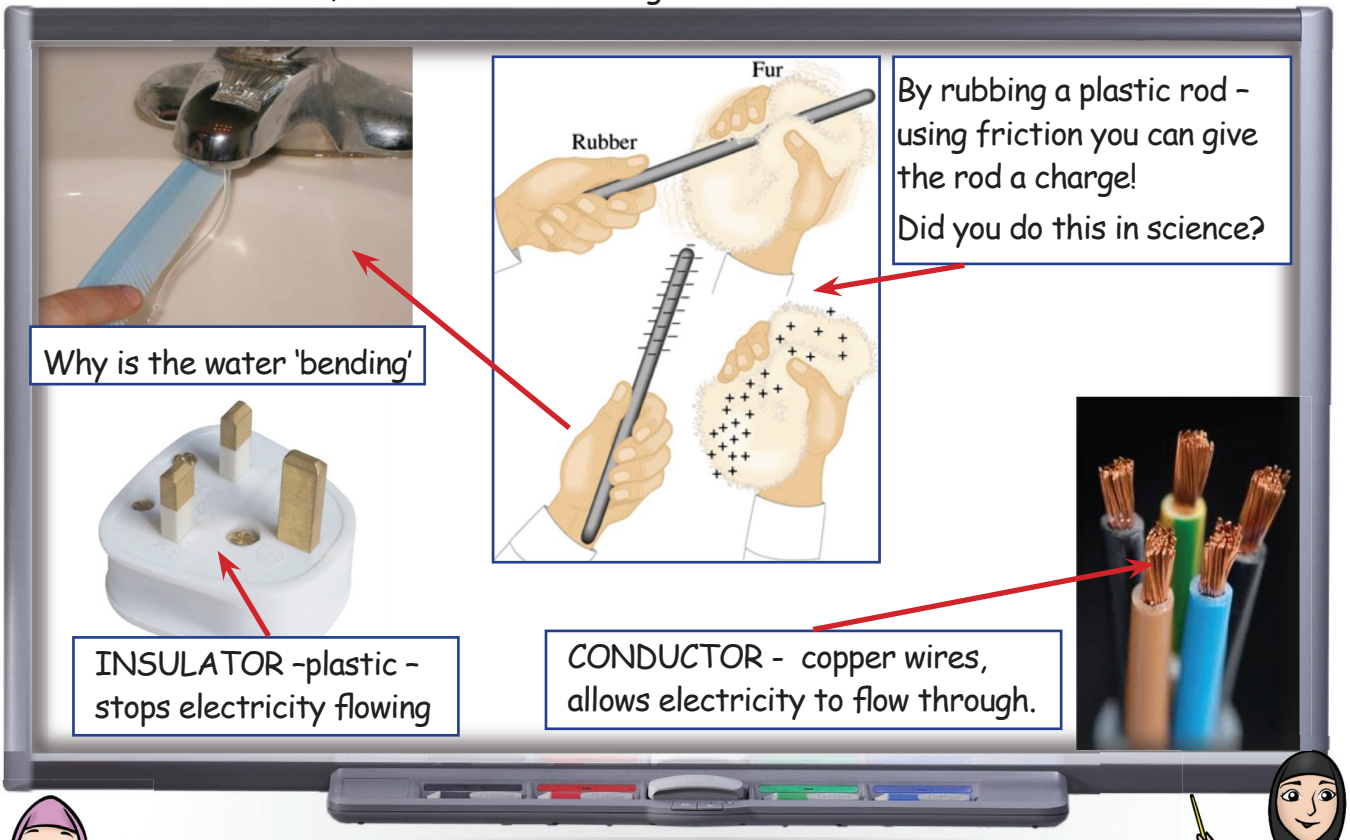
We use..

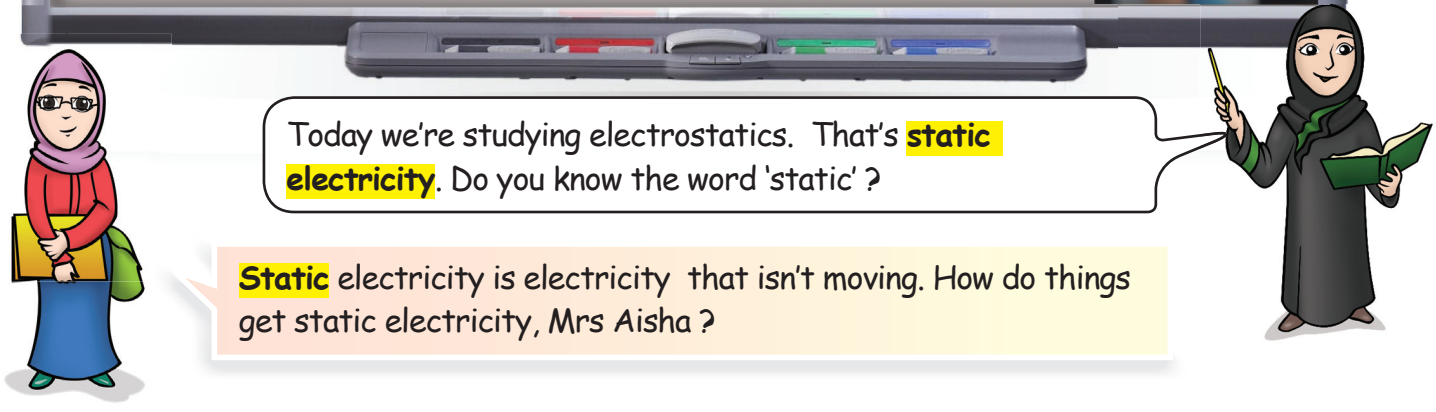


ELECTROSTATICS

KEYWORDS: **static electricity** **charge** **friction** **insulator** **conductor**

Today Mr Aisha is teaching Maha about **Electrostatics**. Read and listen to the lesson, then do the following activities.





Mrs Aisha: **Friction** causes static electricity. **Friction** is the force when two things rub together. An electric **charge** is an amount of electricity in an object. When we **charge** something, we give it electricity.

Maha: Sometimes I get an electric shock when I touch things. Is that static electricity?

Mrs Aisha: Yes, it is Maha. Look at the board. **Conductors** are materials that **conduct** electricity. That means electricity goes through them easily. **Insulators** are materials that do not conduct electricity. Electricity can't go through them. (When a boy touches the metal, he gets an electric charge. The electricity moves, it is not static anymore)

Task 1:

Help us draw lines to match these terms.

1	Static electricity	a)	Things that electricity can't go through.
2	Friction	b)	Electricity that stays in one place.
3	Insulators	c)	Things that electricity can go through.
4	Conductors	d)	The force of two things rubbing.

Task 2:

Help Sheikha and Maha choose the correct words to complete the sentences. Is it a, b, or c?

1. When we ..... something, we give it electricity.

   a) conduct b) charge c) insulate

2. ..... do not let electricity go through them.

   a) Insulators b) Conductors c) Door handles

3. ..... happens when two things rub together.

   a) Insulation b) Conduction c) Friction

Task 3:

Let's work in pairs. ONE of the following sentences is FALSE. Which one is it? Explain why!

1. When something is static, it stays in one place. **TRUE/FALSE**
2. When we want electricity to move, we use a conductor. **TRUE/FALSE**
3. Friction stops static electricity. **TRUE/FALSE**

Number ..... is FALSE, because .....

Task 4:

Work in pairs. Ask and answer these questions about electrostatics!

What is the difference between an insulator and a conductor?

An insulator ..... but a conductor .....

How do we make static electricity?

By ..... ing two .....

What is static electricity?

What is static electricity?

Task 5: PUZZLE TIME!

Help Sheikha and Maha complete the crossword below!

Across

2) The man got a ..... when he touched the door handle!

4) Friction can give things an electric ..... .

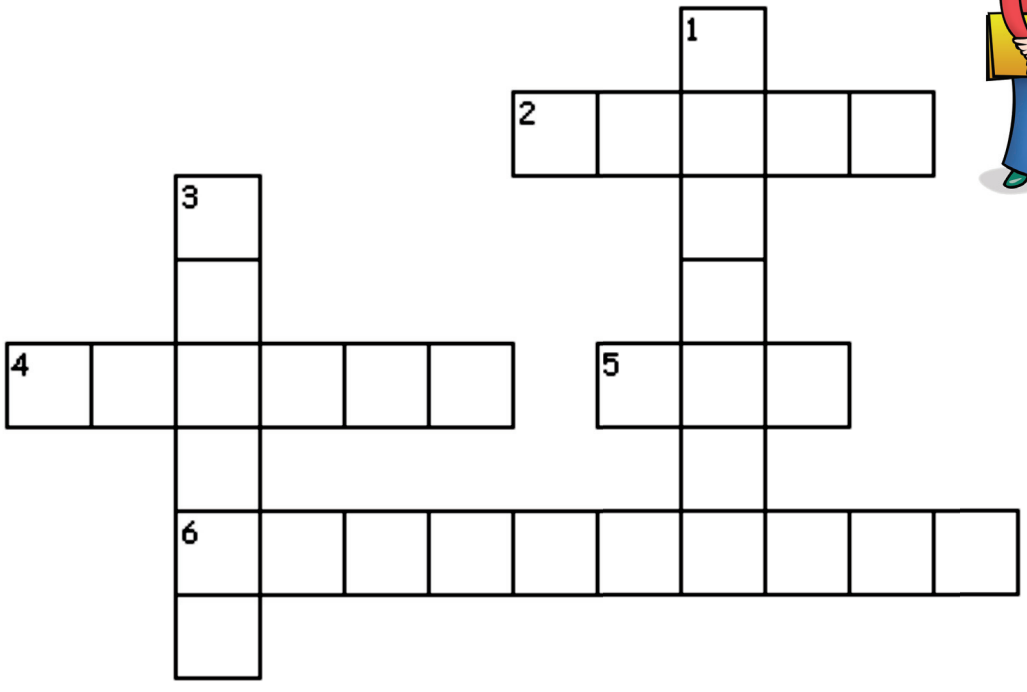
5) We make friction when we ..... two things together.

6) ..... do not conduct electricity.

Down

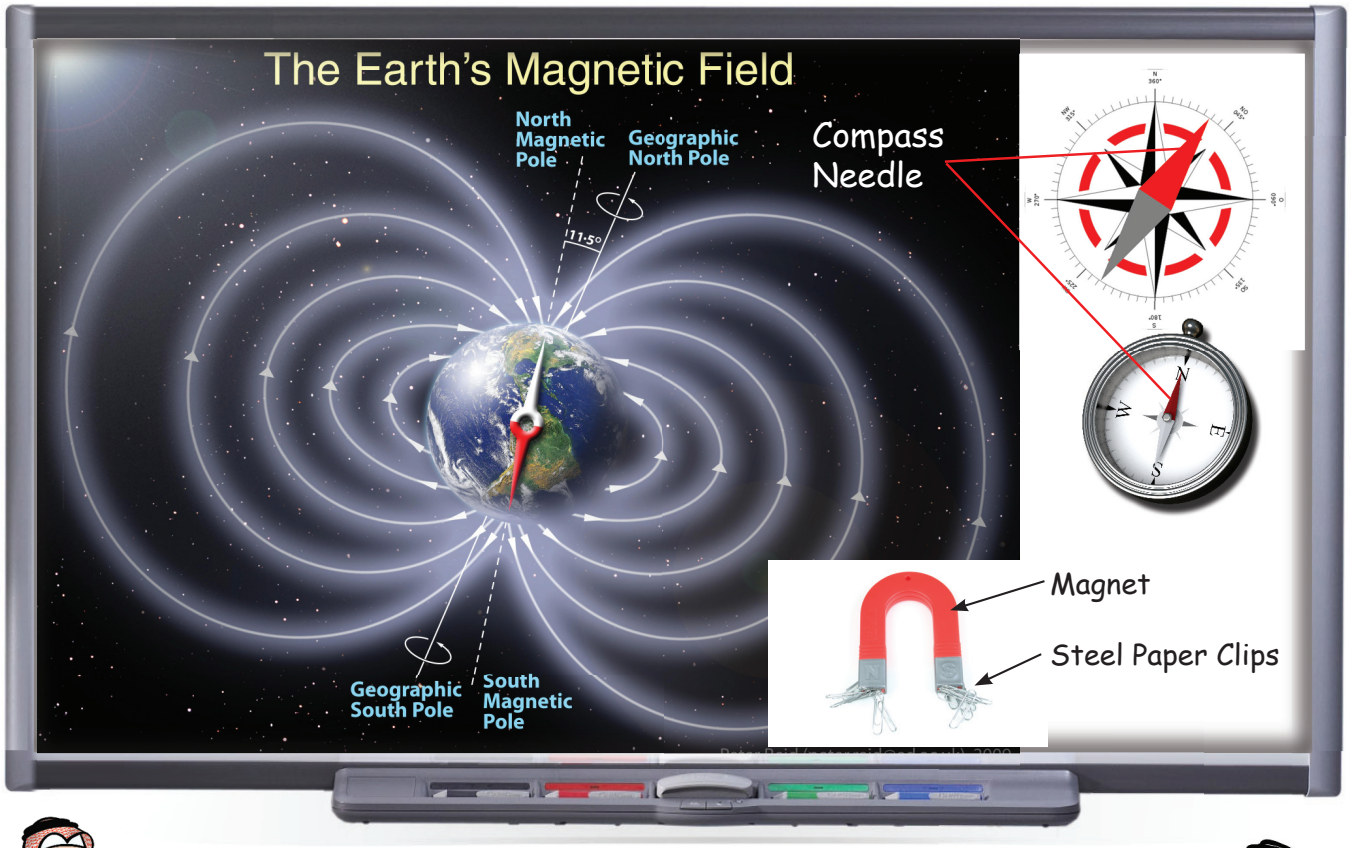
1) Metal door handles ..... electricity.

3) Staying in one place; not moving.



MAGNETISM 1

KEYWORDS: magnet iron steel compass metal non-metal compass needle



Good morning. Today we are going to talk about **magnets** and **compasses**. Does any one know what a magnet is?

I do. A **magnet** is a metal object that can attract or pull other metals towards it.

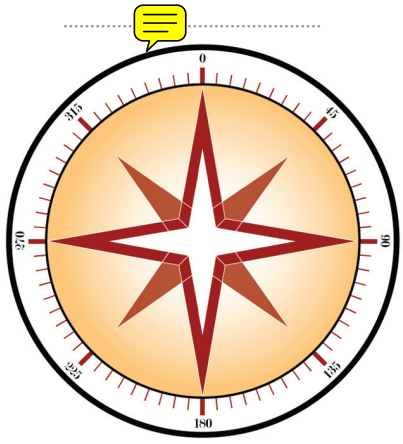
Right, but not all **metals** ! It can attract **iron** and **steel**. It can't attract **non-metals** such as paper or wood.

Now, what is a **compass**? What is a **compass needle**?

I know! We use a **compass** to find directions. It has a metal needle which is called the **compass needle**. It always points north because of the earth's magnetic field. This way we know where north, south, east and west are and we can find the direction we want.

Task 1:

Write the four compass points. North, South, East and West.



Task 2:

Choose words from the box below and fill in the blanks. Some words may be used more than once.

non-metals	paper	compasses	metals

1. ..... are used to find direction.
2. A magnet attracts ..... like, steel.
3. A magnet cannot attract ..... and plastic.
4. Iron and steel are ..... .
5. Wood and plastic are ..... .

Task 3:

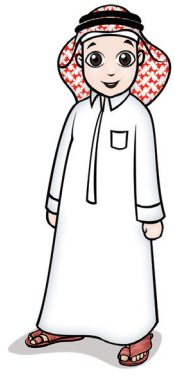
Correct the <u>underlined</u> word in each sentence.

1. <u>A plastic</u> cup attracts metal. .....
2. The compass needle always points <u>south</u>. .....
3. A traveller uses <u>a metal</u> to find his way. .....
4. A compass has <u>three</u> points. .....

Task 4:

Choose the correct answer. Is it a, b, or c?

1. Magnets attract ..... .
   a) all objects b) all metals c) some metals
2. Iron and steel are ..... .
   a) metals b) non-metals c) false-metals
3. ..... attract iron and steel.
   a) Magnets b) Plastic c) Metals
4. A magnet ..... attract/s paper and rubber.
   a) sometimes b) can c) cannot
5. A compass needle always points to the ..... .
   a) west b) east c) north



Task 5:

Ask a partner to answer these questions.

A magnet cannot attract wood. Why?

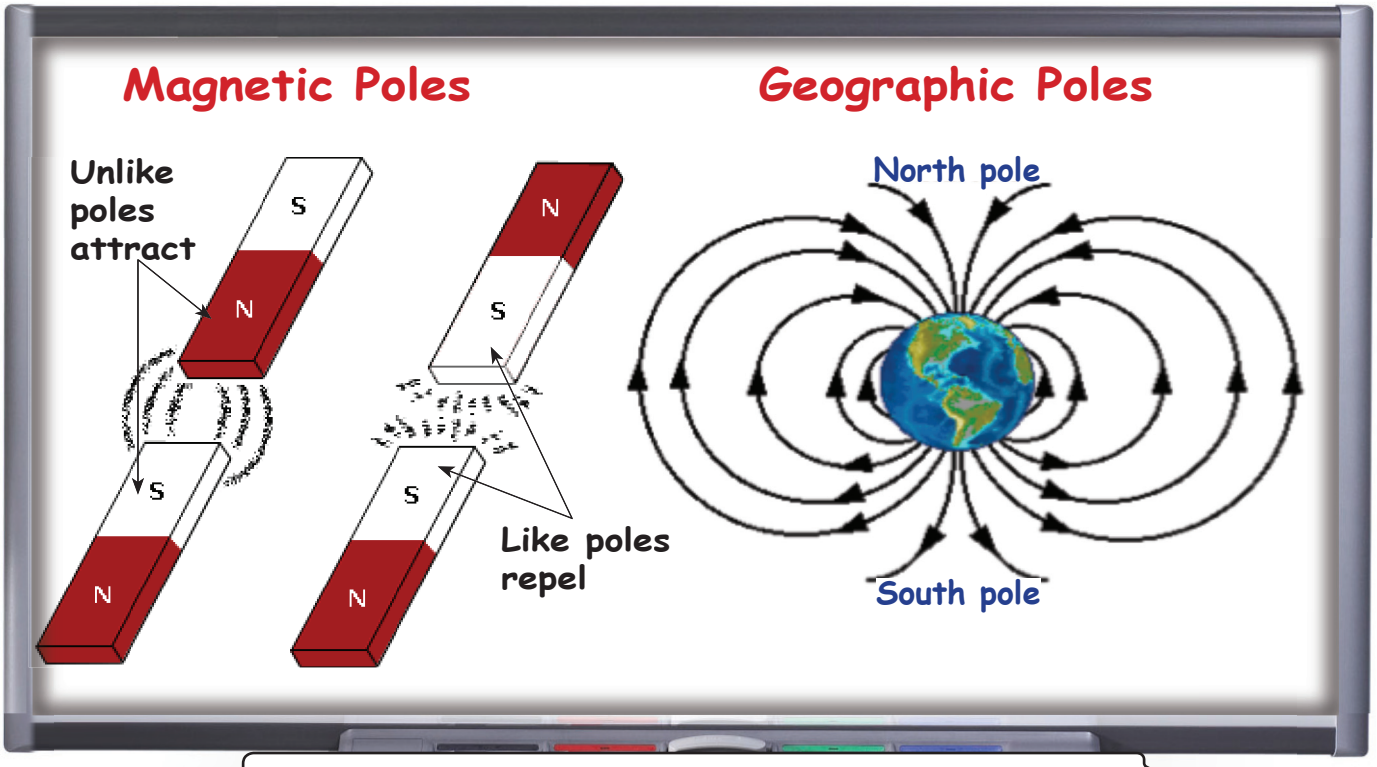
What are the four compass points?

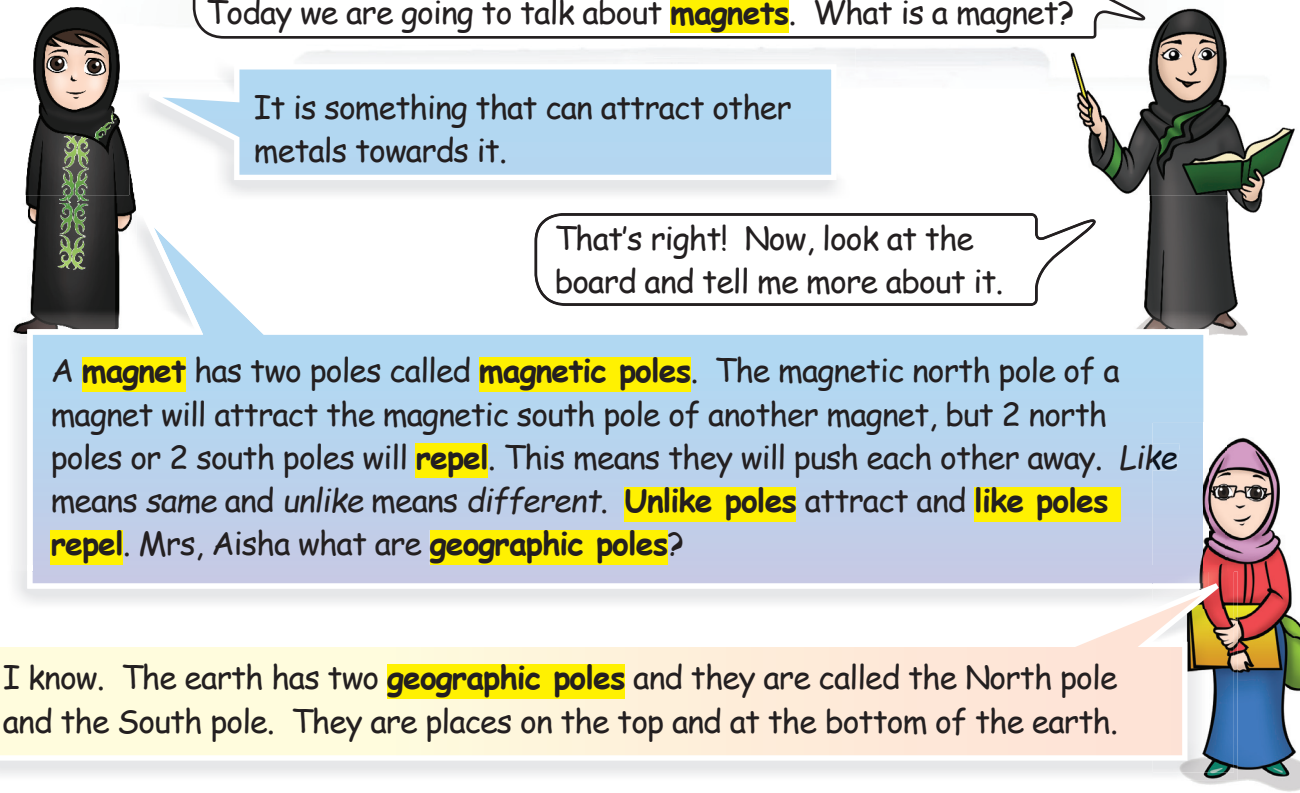
What do travellers use to find their direction?

What direction does a compass needle point to?

MAGNETISM 2

KEYWORDS: magnet, like poles, unlike poles, repel, magnetic pole, geographic poles





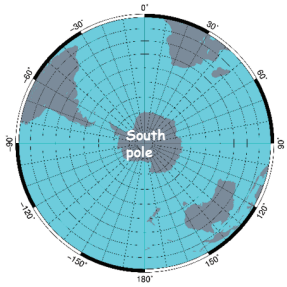
Task 1:

Correct the underlined word in each sentence.

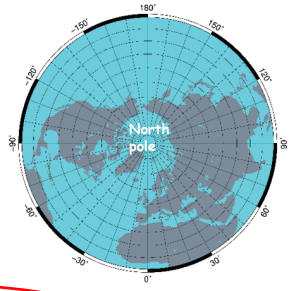
1. The magnet has two poles called geographic poles. .....
2. Magnetic north repels magnetic south. .....
3. To 'push away' means to attract. .....
4. A ~~compass~~ attracts metals. .....
5. The earth has ~~four~~ geographic poles. .....

Task 2:

Choose the correct answer. Is it a, b, or c?



1. A ..... is an object that attracts some metals.
   a) compass b) magnet c) like pole
2. Two north poles will ..... each other.
   a) attract b) repel c) touch



3. North and south poles will ..... each other.
   a) attract b) repel c) give
4. The geographic poles are the ..... .
   a) East and West poles b) East and South poles c) North and South poles
5. A magnet has ..... poles.
   a) four b) three c) two

Task 3: PUZZLE TIME!

Fill in the puzzle.

Across

1) A ..... is an object that attracts metals.

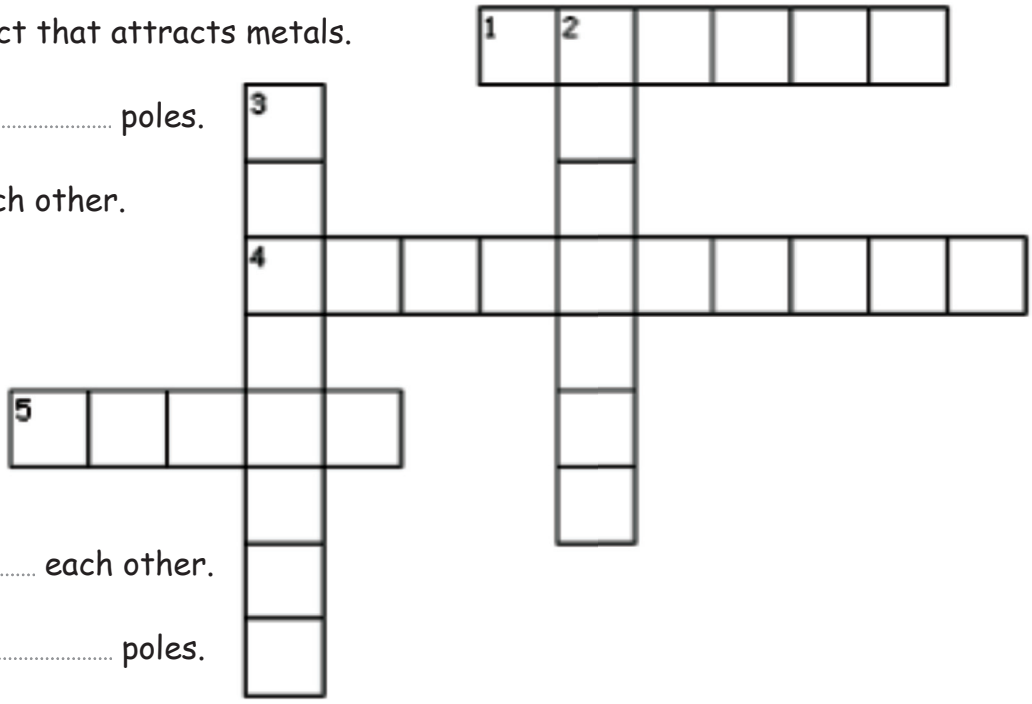
4) The earth has 2 ..... poles.

5) Like poles ..... each other.

Down

2) Unlike poles ..... each other.

3) A magnet has 2 ..... poles.



Task 4:

Work in pairs. The following sentences are all false.
Ask a partner to correct them. Don't forget to take turns.

Like poles attract each other.

North and south poles repel.

Unlike poles repel each other.

Two north poles attract.

The earth has two poles called magnetic poles.

A magnet has two poles called geographic poles.

Corrections

Page NO.	Note	Amendment

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