



Name \_\_\_\_\_

Teaching set \_\_\_\_\_

## Northgate Year 7 Science.

### Knowledge Organiser.

This booklet contains questions from topics that will be covered during year 7. It is broken down into sections to correspond with lessons. You do not need to remember it all in the first few weeks. This is to be used throughout the year, alongside any homework that has been set.

Use it to help learn the definitions of common scientific terms. You can get family members to test your knowledge, make quizzes, games or flashcards.

Mini quizzes may also pop up during lesson time based on the information inside this booklet.

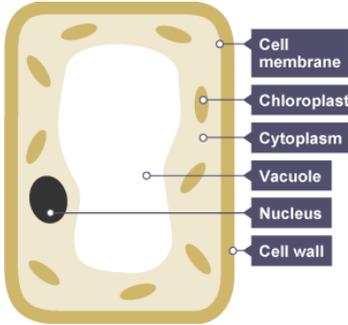
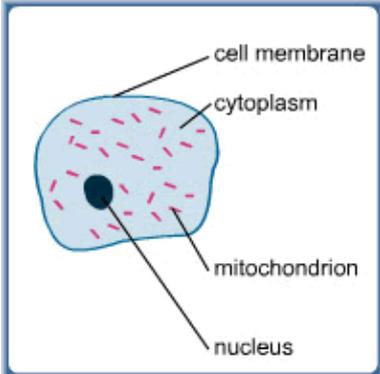
The Activate text book and other digital resources are available online. [www.Kerboodle.com](http://www.Kerboodle.com). Your username is your initial and surname e.g. jsmith and the institution code is po7.

Working scientifically.

	Question	Answer
1	What is meant by accurate?	Close to the true value of what you are measuring.
2	What does analyse mean?	The process of looking at data and writing about what you have found out.
3	How should you present data when one variable is discrete or catagoric and the other is continuous?	In a bar chart.
4	How can you describe categoric data?	A variable that has values that are words. Ie blue or brown eyes.
5	What is a conclusion?	What you write down to say what you have found out during an investigation.
6	What does confidence mean?	How sure you are of your conclusion based on the data/
7	What is continuous data?	A variable that has values that can be any number.
8	What is a variable that you have to keep the same in an investigation?	A control variable.
9	What is data?	Words or numbers that you obtain when you make observations or measurements.
10	What is the dependent variable?	A variable that changes when you change the independent variable. It is the variable you measure.
11	What is discrete data?	A variable that can only have whole-number values. Ie number of people.
12	What does evaluate mean?	To discuss the quality of data collected during an investigation and suggest improvements to the method.
13	What is the variable you change called?	Independent variable.
14	What is an investigation?	An experiment or set of experiments designed to produce data to answer a scientific question or test a theory.
15	What is the best way of presenting results when there are two numerical sets of data?	A line graph
16	What is a line of best fit?	A smooth line on a graph that travels through or very close to as many of the points plotted as possible.
17	How do you calculate the mean?	An average of a set of data, found by adding together all the values in the set and dividing by the number of values in the set.
18	What is observation?	Carefully looking at an object or process.
19	What is an outlier?	A result that is very different from the other measurements in a data set.
20	What is meant by precise?	This describes a set of repeat measurements that are close together.
21	What is a prediction?	A statement that says what you think will happen.

22	Describe a random error	An error that causes there to be a random difference between a measurement and the true value each time you measure it.
23	What is the range in a data set?	The difference between the lowest and highest values a variable can have.
24	What is meant by repeatable?	When you repeat measurements in an investigation and get similar results they are repeatable.
25	What is meant by reproducible?	When other people carry out an investigation and get similar results to the original investigation the results are reproducible.
26	Describe a risk assessment	A description of how you will make it less likely that people will be injured, or equipment damaged, and what to do if this happens.
27	What is the spread?	The difference between the highest and lowest measurements of a set of repeat measurements.
28	Describe a systematic error	An error that causes there to be the same difference between a measurement and the true value each time you measure it.
29	What is uncertainty?	The doubt in the result because of the way that a measurement is made.
30	What is a variable?	A quantity that can change, for example, time, temperature, length, mass.

## Cells and reproduction

	Question	Answer
1	What is an organ? Give an example of an organ in humans.	A structure in a living thing that does one or more important jobs. Any sensible named organ such as liver, brain, heart, lungs.
2	What is a cell?	The smallest structural unit of living things.
3	Draw and label a typical plant cell.	 <p>The diagram shows a rectangular plant cell with a thick cell wall. Inside, there is a large central vacuole, a dark nucleus, and several green chloroplasts. The cytoplasm is the fluid-filled space between the cell wall and the vacuole. Labels with lines pointing to each part are: Cell membrane, Chloroplast, Cytoplasm, Vacuole, Nucleus, and Cell wall.</p>
4	Draw and label a typical animal cell.	 <p>The diagram shows an irregularly shaped animal cell with a thin cell membrane. Inside, there is a dark nucleus, a mitochondrion, and cytoplasm. Labels with lines pointing to each part are: cell membrane, cytoplasm, mitochondrion, and nucleus.</p>
5	What is the function of the nucleus?	Contains the genetic material, the 'instructions' for running the cell.
6	What is the function of the cytoplasm?	Where the cell's chemical reactions happen.

7	What is the function of the cell membrane?	To control what goes in and out of the cell.
8	What is the function of the cell wall in plants?	To protect the cell and give it shape and rigidity.
9	What is the function of the vacuole in plants?	It is filled with a fluid that contains sugar for the cell and gives the cell shape and rigidity
10	What is the function of the chloroplasts in plants?	To use energy from light to produce food.
11	What is a flower for?	It contains the plant's sexual organs and makes sex cells
12	Briefly describe fertilisation in plants.	Pollen grain from anther lands on stigma. The nucleus from the pollen grain and ovule fuse and this then becomes the seed.
13	How does pollen from one plant reach the stigma of another?	Blown by wind or carried by insect/bee/butterfly/moth/hummingbird/bat etc.
14	Name the main mechanisms of seed dispersal.	Wind, water, explosive, animal (hooks/burrs), animal (buried/stored), animal (eaten and excreted).
15	State some changes that occur during puberty in boys.	Testes start producing sperm and become larger, voice deepens, shoulders become broader, hair grows in pubic area, chest, armpits and face, sweat more, acne, mood swings, etc.
16	State some changes that occur during puberty in girls.	Ovaries begin releasing eggs/ova, periods start, breasts develop, hips widen, hair grows in pubic area and armpits, sweat more, acne, mood swings etc.
17	What causes the physical changes that take place at puberty?	Hormones
18	Why do these physical changes at puberty occur?	To prepare the body for reproduction
19	Name the sex cells in humans.	Sperm and egg.
20	How is a sperm cell adapted to its function?	Tail to swim to egg, enzymes in head to break down jelly coat of egg, half the normal number of chromosomes, many mitochondria to release energy for long swim
21	How is an egg cell adapted to its function?	Jelly coat to protect and harden after sperm entry to prevent other sperm from getting in, large store of food to provide energy for cell division/growth after fertilisation.
22	Describe what happens at fertilisation in humans.	Sperm reaches egg, head enters the egg cell, nuclei of sperm and egg fuse.
23	Describe the function of the ovaries.	Organs in a woman where an egg is released from.
24	Describe the function of the uterus (womb).	Muscular organ in a woman where the foetus/baby develops until it is ready to be born.
25	Describe the function of the testes.	To produce sperm.
26	How often does a woman have a period (on average)?	Once per month/every 28 days
27	What is a period?	Shedding of the lining of the uterus that happens if an egg is not fertilised.
28	How often does a woman release an egg?	Once a month/every 28 days.
29	How long does pregnancy last in humans?	9 months, or 40 weeks.
30	How do food water and oxygen reach the growing baby?	Through the placenta.
31	Briefly describe birth.	Waters break (amniotic sac breaks), contractions (of uterus) start. Contractions push the baby out through the vagina.

Particles, atoms, elements and compounds.

1	What is an atom?	The smallest part of an element, atoms are the building blocks of molecules
2	What is a chemical change?	A change that results in a new chemical, chemical changes are not easy to reverse.
3	Give three examples of a chemical change.	Combustion or burning, corrosion and neutralisation.
4	What is a compound?	A chemical substance that is made from two more different types of atom or elements.
5	What is concentration?	It is a measure of the amount of particles in a given volume.
6	What is condensation?	The process when a gas cools down and turns into a liquid, (it is the opposite of evaporation).
7	What is diffusion?	The movement of one substance through another substance.
8	What are the three "states of matter"?	Solid, liquid and gas
9	What is dissolving?	Dissolving happens when a solid mixes with a liquid to become a solution.
10	What is an element?	An element is a substance that is made up of only one type of atom.
11	What is evaporation?	Evaporation is the process that turns a liquid into a gas, (it is the opposite of condensation).
12	What is freezing?	Freezing is the process that turns a liquid into a solid, it is the opposite of melting?
13	What is melting?	Melting is the process that turns a solid into a liquid, (it is the opposite of freezing).
14	What do we call the change from gas to liquid?	Condensing
15	How are the particles arranged in a gas?	They are very far apart, moving very fast, they have lots of energy and are arranged randomly.
16	What is kinetic energy?	The energy of movement.
17	How are the particles arranged in a liquid?	They are close together and touching, they can move past one another and are arranged in an irregular fashion.
18	What is a molecule?	A molecule is a group of atoms that have been chemically joined together.
19	What is a particle?	A very small part of a substance, it is sometimes used instead of the word molecule.
20	What is a physical change?	A change that affects the way a substance looks but that doesn't affect the way it reacts.
21	Give three examples of a physical change.	Melting, freezing, evaporation (or you could have sublimation , condensing).
22	How are the particles arranged in a solid?	They are close together and touching, they cannot move past one another and are arranged in a regular orderly fashion.
23	Name the three particles that make up an atom	Protons, neutrons and electrons
24	What is a mixture?	More than one type of atom, but not chemically joined together.
25	What are the columns in the periodic table called?	groups

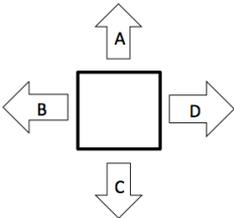
26	What are the rows in the periodic table called?	periods
27	What feature links elements in the same group?	They have similar chemical properties (their reactions are the same)
28	Where do we find metals on the periodic table?	Towards the left and the bottom
29	Where do we find non-metals on the periodic table?	Towards the right and the top
30	What are metalloids?	They are elements that behaves like a metal sometimes and like a non-metal other times ( intermediate behaviour)

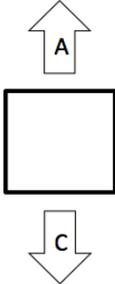
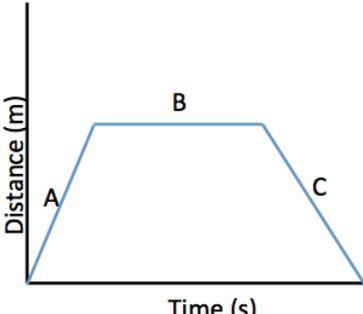
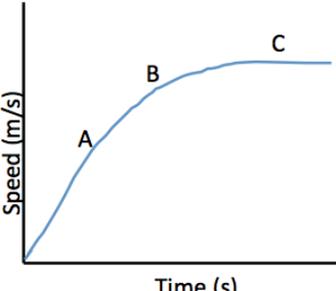
### Chemical reactions

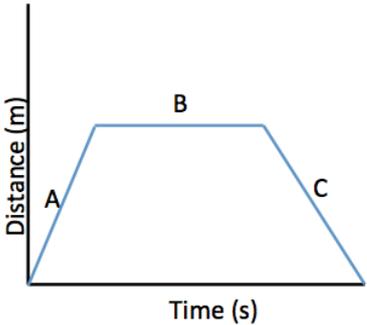
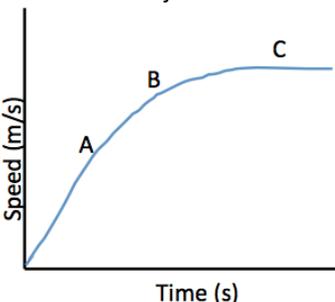
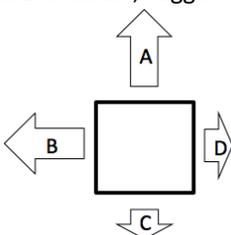
1	which metal would show no signs of corrosion even after hundreds of years?	Gold
2	What word means "the liquid that a solid dissolves in"	Solvent
3	Which has a fixed melting point, a compound or a mixture?	A compound
4	Which is easily reversed, a chemical or a physical change?	A physical change
5	What gas is formed when a metal reacts with an acid?	Hydrogen
6	If acid is added to sodium hydrogen carbonate the mixture fizzes. What does the fizzing indicate?	That the reaction is producing a gas.
7	In chemistry, what does the word "product" mean?	A product is a new substance made in a chemical reaction.
8	What two products are made when an acid and an alkali react?	A salt and water.
9	What does the word " insoluble" mean?	A substance is insoluble if it will not dissolve.
10	In chemistry, what does the word " corrosive" mean?	A corrosive substance can burn living tissue e.g. Skin
11	What can chromatography be used for?	Chromatography can be used to separate and identify miscible liquids according to the weight of the particles in the substance e.g. Mixtures of inks.
12	Give an example of two imiscible liquids.	Oil and water.
13	What is distillation used for?	Distillation is used to separate miscible liquids according to their boiling points e.g. Alcohol and water
14	What is a physical reaction?	A change that is easily reversible
15	What is a chemical reaction?	A change that is not easily reversible
16	What are the four signs that a chemical reaction has taken place?	<ol style="list-style-type: none"> <li>1. Colour change</li> <li>2. Temperature change</li> <li>3. A gas is given off (bubbles/fizzing)</li> <li>4. A change in state e.g a precipitate is made</li> </ol>
17	What is a reactant?	A substance we have at the start of a reaction
18	What is a product?	A substance we have at the end of a reaction
19	What does the arrow in a word equation indicate?	It shows that a reaction has taken place
20	What two things does the formula of a compound tell us?	<ol style="list-style-type: none"> <li>1. What elements are in a compound</li> <li>2. What ratio of those elements in the compound</li> </ol>
21	Give three ways in which a mixture is different from a compound.	<ol style="list-style-type: none"> <li>1. The ratio of the elements is not fixed</li> <li>2. The properties of a mixture are often the "average" of those of the elements (whereas compounds can have properties</li> </ol>

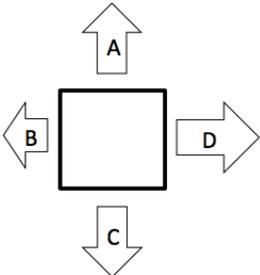
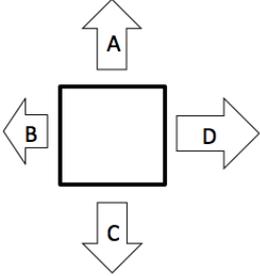
		that are entirely different from those of the elements that make them up.) 3. The components of a mixture are not chemically joined together.
22	Describe what "distillation" is	Distillation is the separation of two miscible liquids (liquids that mix, e.g. water and alcohol), by means of their different boiling points.
23	When magnesium burns does it gain or lose mass, and why?	Magnesium gains mass because of the mass of the oxygen added to it.
24	What is the principle of "conservation of mass"?	Matter cannot be created or destroyed. The total mass of the products of a reaction is the same as the total mass of the reactants.

### Forces

1	Name 8 forces	Thrust, air resistance, friction, weight/gravity, reaction, upthrust, lift, magnetism
2	State the unit for force	Newton, N
3	State an example where friction is useful	Any example of useful friction (e.g. shoes on floor, tyres on road)
4	State Newton's first law of motion	If the forces on an object are balanced, the object will continue to do what it is already doing.
5	State Newton's second law of motion	If the forces on an object are unbalanced, two things about the object can change, the speed of the object and the direction of motion
6	State Newton's third law of motion	If object A exerts a forces on object B, then object B exerts an equal but opposite force on object A
5	What is the motion of the car if all forces are balanced?	Constant speed/stationary
7	Describe what will happen to the car if the largest force is thrust?	It will accelerate
8	If C is weight/gravity, what is the force A? 	Reaction
9	State the formula for speed	Speed = distance / time
10	Suggest how you can decrease friction	Using a lubricant such as oil, Vaseline or ball bearings
11	A car travelled 20km in 1 hour, calculate it's speed in km/h.	Equation: speed = distance/ time Substitute: speed = 20 / 1 Calculate: 20 / 1 = 20 Units: 20km/h
12	What is the standard unit for speed?	Metres per second, m/s

13	<p>If force A is 10N and force C is 10N, what is the resultant force acting on this object:</p> 	0N
14	What is the unit for weight?	Newtons, N
15	<p>At which points A, B or C, does the object have the greatest speed?</p> 	A- where the graph has the steepest gradient
16	If an object has a resultant force of 0N, describe its motion	It is either stationary or moving at a constant speed
17	State an example of when friction is not useful	Any example of friction not being useful (e.g. in an engine, axles, motor, machinery)
18	<p>Describe the motion of the object at C</p> 	The object is travelling at constant speed
19	What two things do the arrows on a force diagram demonstrate?	Size of force Direction of force
20	What is terminal velocity?	Terminal velocity acts on a falling object when all forces are balanced and the object is falling at a constant speed
21	Describe the motion of the object at B	The object is stationary

		
22	Suggest a suitable astronomical unit	Light years
23	Calculate the time taken for an object to travel 16m at a speed of 4m/s	Equation: speed = distance/ time Rearrange: Time: Distance / speed Substitute: Time: Distance / speed Calculate: $16 / 4 = 4$ Units: 4s
24	Describe the objects motion at A	The object is accelerating fast
		
25	If D is thrust, suggest the name of force B	Friction/drag/air resistance
		
26	Calculate the distance travelled by an object whose speed is 5m/s over a time period of 10 minutes	Convert: 10 minutes into seconds: $10 \times 60 = 600$ Equation: speed = distance/ time Rearrange: Distance = speed x time Substitute: Distance = $5 \times 600$ Calculate: $5 \times 600 = 3000$ Units: 3000m

27	If D is thrust, describe the motion of the object 	The object is accelerating in the direction of D
28	For this accelerating object, state the resultant force if A is 15N, B is 5N, C has a force of 15N and D is 15N 	10N in the direction of D

### Space

	Question	Answer
1	What is an artificial satellite?	A manmade spacecraft.
2	What is an asteroid?	Lumps of rock orbiting the Sun left over from when the Solar System formed.
3	What is a scientist called who studies space?	astronomer.
4	What is the imaginary line that the Earth rotates around?	axis.
5	What is a comet?	Dust particles frozen in ice that orbit the Sun.
6	What is a constellation?	A collection of stars that make a pattern in the sky.
7	How long does it take for a planet to rotate one full spin on its axis?	A day.
8	What is a dwarf planet?	A small lump of rock in orbit around the sun.
9	Name the rocky inner planet, third from the Sun in our Solar System.	Earth.
10	What shape is an ellipse?	A squashed circle or oval shape.
11	What are exoplanets?	Planets in orbit around a star other than our Sun.

12	What do we call a group of stars and the solar systems that surround them? galaxy	A galaxy.
13	What is a gas giant?	An outer planet in the Solar System made mainly from gas.
14	What is the non-contact force that acts between two objects?	gravity
15	What is a lunar eclipse?	An eclipse that happens when the Earth comes between the Sun and the Moon.
16	Name the rocky inner planet, fourth from the Sun in the solar system.	Mars
17	Name the planet closed to our Sun	Mercury
18	What is a meteor?	A piece of rock or dust that makes a streak of light in the night sky.
19	What is a meteorite?	A stony or metallic object that has fallen to Earth from outer space.
20	What is the name of the galaxy containing our Sun and Solar system? Milky Way	The Milky Way
21	What is the rock orbiting Earth called?	The Moon.
22	Give an example of a natural satellite	A moon in orbit around a planet.
23	What is the name for the time when part of the Earth is facing away from the sun?	Night
24	What is an orbit?	The path taken by one body in space around another.
25	What is a partial eclipse?	A solar eclipse where only part of the Sun is covered by the Moon.
26	The different shapes of the moon that we see on Earth are known as?	Phases of the Moon.
27	What is a planet?	Any large body that orbits a star in a Solar System.
28	How do we get seasons on Earth?	As the Earth moves around its orbit. It causes changes in the temperature during the year.
29	What is a solar eclipse?	An eclipse where the Moon comes between the Sun and the Earth.
30	What makes up our Solar System?	The Sun and the planets and other bodies in orbit around it. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus Neptune
31	What is a star?	A body in space that gives out its own light.
32	What is the Sun?	The star at the centre of our Solar System.
33	What does the word terrestrial mean?	Made of rock.

34	What is a total eclipse?	An eclipse where all of the Sun is covered by the Moon.
35	What is the name for everything that exists?	Universe
36	Name a rocky inner planet that is second from the Sun?	Venus.
37	What is a year?	The length of time it takes for a planet to orbit the Sun.

Drawing graphs.

1. Look at your range of data and the type of data you have.
2. Choose the correct type of graph (working scientifically section of the booklet will help you choose).
3. Draw on your X and Y axis to fit the paper
4. Choose an appropriate scale to fit onto the paper, remembering each square has to be worth the same. Label your axis with the variable they represent and the units measured in.
5. Using your data plot along the X axis then up the Y axis.
6. Draw a line of best fit.

