SKEGNESS ACADEMY



Name …… Set ……

Year 7 Knowledge Organiser Term 1 and 2

Assessment dates:

Practical Assessment 1 October 2027 Your practical assessment will be to outline the method to produce a chromatogram to separate different inks.

End of Term Written Assessment December 2027 This will look at all the topics you have completed this term.

Important Dates This Term

Pasteur Day 28th September

Curie Day 7th November



'Putting Every Student on the Path to a Happy, Successful and Fulfilling Life'

Topics Covered this term

Cells – You will be learning about the structure of different types of cells, learning how to use a microscope and how to write a scientific method

Particles – You will be learning about the states of matter and how they change. You will also investigate the density of different objects and diffusion, how particles spread out.

Forces – You will be able to describe forces in terms of balanced and unbalanced forces and calculate resultant forces and investigate how different surfaces affect friction.

Homework

Home Learning is seen to make an important contribution to pupils' progress at school and can ensure that teaching time is used to maximum effect. You will be set homework every Wednesday on GCSEpod the QR code will take you there. The expectation is that your homework will take you 10 minutes per week. Consolidating and revisiting the weeks learning

gcsepod an access company

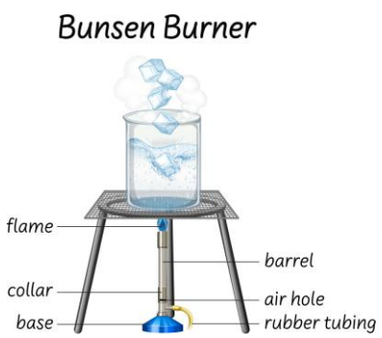
'Putting Every Student on the Path to a Happy, Successful and Fulfilling Life'

Year 7 Science: Term 1
Safe Working, Cells and Matter

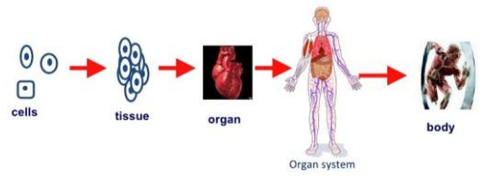
Week 1 and 2

Introduction to Science

- Safety Rules for science lessons
- How to spot hazards
- Using a Bunsen burner safely
- How to plan and carry out a safe investigation







Week 3

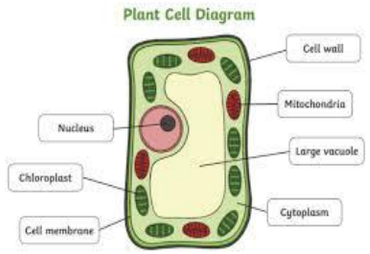
Big Picture: Cells

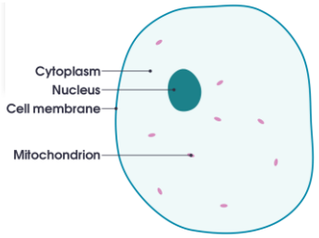
Everything that is alive is made of tiny parts, called cells.

•**Animal Cells** have an irregular shape and contain 4 key components: cell membrane, nucleus, cytoplasm and mitochondria

•**Plant Cells** have a more regular structure and contain the extra components of a cell wall, vacuole and chloroplasts

•**Microscopes** help us to see cells by making them appear bigger





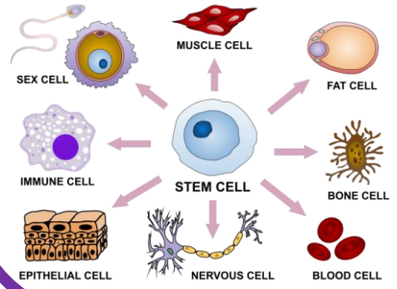
Week 4

Big Picture: Cells

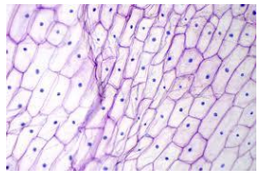
•**Writing methods** help us investigate changing factors in science and allow others to repeat an investigation to ensure results are valid

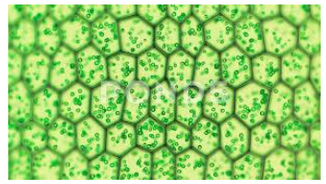
•**Observing Cells**, calculating magnification and making slides help us compare cells from different organisms

•**Specialised Cells** have particular shapes and features that carry out a job e.g. sperm cell designed to swim up the uterus









Week 5

Big Picture: Cells

- **Organising Cells**

Cells make up tissues, tissues make up organs and organs make up organ systems e.g Nerve cell – nerve tissue – spinal cord - nervous system

Big Picture: Particles

Materials are made up of tiny objects called particles. The particles are too small to see, even with a microscope. The are about 8 400 000 000 000 000 000 000 000 particles in a glass of water. The particle model is a way of thinking how a substance behaves in terms of its tiny moving or vibrating particles. You can use the particle model to explain properties of substances. The properties of a substance depend on 3 things: what it's particles are like, how it's particles are arranged and how it's particles move about.

Week 6

Big Picture: Particles

Water can exist in 3 states, as a solid, liquid or a gas. These are the states of matter. The particles of water in its 3 states are identical. But the properties of ice, liquid water and steam are different. You can use the **particle model** to explain why.

	Solid	Liquid	Gas
Arrangement of particles	Close together Regular pattern	Close together Random arrangement	Far apart Random arrangement
Movement of particles	Vibrate on the spot	Move around each other	Move quickly in all directions
Diagram			

Key words:

Cell - A tiny structure which can be found in all living things

Tissue - A group of similar cells working together.

Microscope - An instrument for observing objects which are too small for the eye to see.

Hazard – an event that has the potential to cause harm

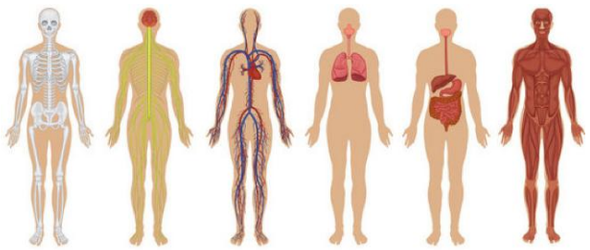
Particle – a very tiny object, such as an atom or molecule that materials are made from

Matter – any substance that has mass and takes up space by having volume made of particles

Year 7 Science: Term 1
Safe Working, Cells and Matter

Week 1 and 2

Questions	Answers
What is a hazard?	Something that can cause harm
What is a scientific theory?	An idea used to explain events in science
What is a measurement (in science)	The result of an experiment that can be measured with scientific equipment
Why might we repeat our experiment 3 times	We carry out 3 repeats and find an average in order to identify errors and make our results more reliable
What is an anomaly?	A result that does not fit with the rest of the data

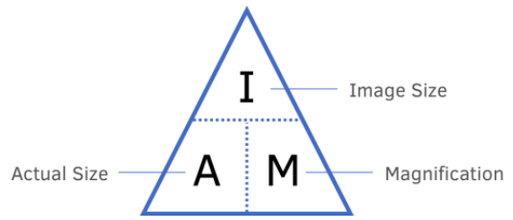


Week 3

Questions	Answers
Name the 3 key components of animal cells	Nucleus, cell membrane, cytoplasm, mitochondria
Name the extra components in plant cells	Cell wall, chloroplasts, vacuole
What is the function of the nucleus?	It contains genetic material (DNA) which controls the cell's activities
What is found inside a vacuole?	Sap – a liquid to store substances and keep the cell rigid
What is a Stem Cell?	undifferentiated cells that have not yet specialised to perform a specific function

Week 4

Questions	Answers
State 2 things you need to include in an investigation plan	What equipment you will use and why, what method you are going to use and why
What are the 3 types of variables?	Independent = you change Dependent = you measure Control = you keep the same
Who invented the microscope?	Anton Von Leuenhooke. Robert Hooke observed the first cells using a microscope
How do you calculate magnification?	$\text{Magnification} = \frac{\text{Image size}}{\text{Actual size}}$
What does specialised cell mean?	A cell whose shape and structure enable it to perform a particular function



Week 5

Questions	Answers
What is a tissue?	A group of specialised cells e.g. muscle cells
What is an organ?	Different tissues that work together to perform a function e,.g the lungs, the kidneys
How does increasing temperature affect movement of particles in a gas?	Heating increased kinetic energy so the particles move faster, in random directions
What is density?	Mass per unit volume, how tightly packed the particles are
What affects diffusion?	The movement of particles from an area of high to an area of low concentration

Week 6

Questions	Answers
What are the properties of a liquid?	Fixed volume, takes the shape of a container, can be poured, cannot be compressed, particles move freely
Describe a solid	A regular pattern of particle, all touching in a fixed position
Can you compress a liquid?	No, because the particles are already touching each other
What is melting?	When a solid become a liquid
What is condensation?	When a gas cools to become a liquid

Key words:

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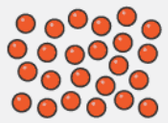
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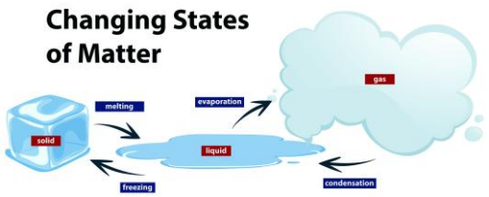
Year 7 Science: Term 2
Particles, Forces and Motion

Week 1

Big Picture: Particles

	Solid	Liquid	Gas
Arrangement of particles	Close together Regular pattern	Close together Random arrangement	Far apart Random arrangement
Movement of particles	Vibrate on the spot	Move around each other	Move quickly in all directions
Diagram			

Only gasses can be compressed because there is empty space between the particles

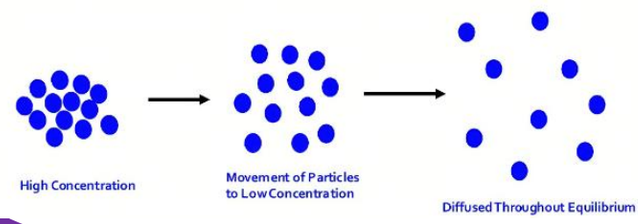


Week 2

Big Picture: Particles

Diffusion is the movement of particles from an area of high concentration to and area of low concentration.
Diffusion happens in gasses and liquids because the particles can move freely.

Diffusion is affected by:
Temperature
Particle Size
The state of the diffusing substance



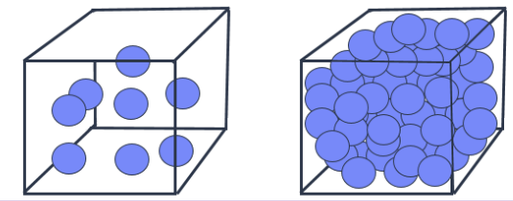
Week 3

Big Picture: Particles

Density is a measure of how tightly packed the particles are. For example, Solid gold is more dense than liquid gold because the particles are more tightly packed together.

Density is not the same as how heavy something is. Density is the number of particles in a certain space

Low Density High Density





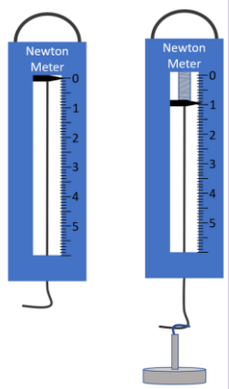
Week 4

Big Picture: Forces and Motion

All forces are either push or pull. For example, when you drop a tennis ball gravity is pulling it down. When you kick a football you are pushing the ball with your foot.

Forces can be contact this means you have to touch them to exert a force or non-contact which means you don't have to touch the object such as gravity.

Forces can be measured using a newton meter



Week 5

Big Picture: Forces and Motion

Speed is how fast you travel in a certain time. If you are moving at 10 m/s (metres per second) that means every second you travel 10m

To calculate speed, you need to use the equation

$$Speed = \frac{Distance}{time}$$

Relative motion is how far you move relative to the observer. For example, two cars moving towards each other at 10m/s have a relative speed of 20m/s.

Key words:

Contact force – A type of force which is only exerted when the objects touch

Diffusion – The movement of particles from an area of high to low concentration until they are evenly spread out.

Distance – How far an object travels in a certain direction

Density – How tightly pack the particles are

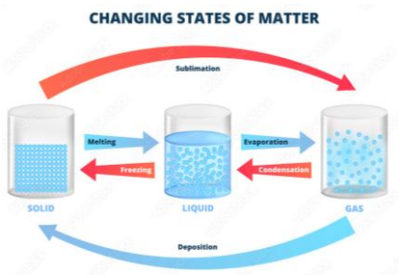
Forces – Push or pull forces which result in a change in velocity, shape or direction

Newton Metre – A piece of science equipment used to measure the force exerted on an objects

Year 7 Science: Term 2
Particles, Forces and Motion

Week 1

Question	Answer
Why can a solid not be compressed?	A solid cannot be compressed as there are
How do the particles in a gas move?	The particles in a gas moves freely. There are no intermolecular forces between molecules.
Is a cake a solid or a gas?	A cake is a solid as the particles are close together and the cake keeps a consistent shape.
Name the three states of matter	Solid, Liquid and gas.
What are material made from?	All materials are made from particles

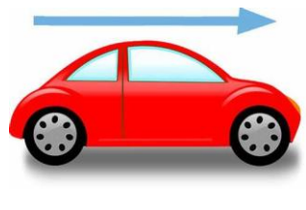


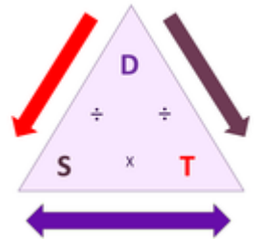
Week 2

Question	Answer
How does temperature affect diffusion?	The higher the temperature the faster the rate of diffusion as the particles move quicker.
Why can diffusion not happen in a solid?	The particles in a solid tightly packed so nothing can diffuse through it.
Define diffusion	Diffusion is the movement of particles from a high to low concentration until they are evenly spread.
What happens if you put orange juice in water	The particles of orange juice will spread out in the water until they are evenly spread.
Does diffusion need energy	No

Week 3

Question	Answer
Why does wood float on water	Wood has a lower density than water so it floats.
Why does solid gold have a higher density than liquid gold?	The particles in a solid are more tightly packed than in a liquid
What is the equation for density?	$Density = \frac{mass}{volume}$
Explain how increasing the temperature affects density	The particles will become less tightly packed so are less dense.
Define density	How tightly packed the particles are





Week 4

Question	Answer
A contact force is	A force which can only be exerted by touching the object
What is the unit of force?	The unit of force is the Newton
What is a force measured with?	Force is measured with a Newton Metre
Three things a force can change	A force can change speed, shape or direction
Gravity is	A non-contact force which pulls things to the centre of mass

Week 5

Question	Answer
If a car is moving right at 10m/s and another is moving left at 20m/s what is the relative motion?	30m/s
Define speed	Distance travelled per second
Give the speed equation	$Speed = \frac{Distance}{time}$
A car travels 150m in 20 seconds what is their speed?	$Speed = \frac{150}{20} = 7.5m/s$
What is relative motion?	How fast an object is moving relative to the oberver

Key words:

Contact force – A type of force which is only exerted when the objects touch

Diffusion – The movement of particles from an area of high to low concentration until they are evenly spread out.

Distance – How far an object travels in a certain direction

Density – How tightly pack the particles are

Forces – Push or pull forces which result in a change in velocity, shape or direction

Newton Metre – A piece of science equipment used to measure the force exerted on an objects

Where can science take you?

Every topic you do every term links to many different career pathways.

If you want to know more about the careers your learning is linked to look at some of the possible careers this terms learning links to. Scan the QR codes for more information.

Topic – Cells

Biomedical scientist – This career can involve investigating cells and genomes to uncover hereditary conditions and testing for infections and diseases, like hepatitis and diabetes. You can work in health care but also for private companies.



Topic – Particles

Refrigeration and air-conditioning installer - plan the layout of pipework, ducts and control panels install components provide scheduled maintenance and find and fix faults perform quality checks to make sure systems are working properly and safely retrofit buildings to meet new environmental standards



Topic Forces

Outdoor activities instructor – You will work with people of different ages and abilities, plan and prepare suitable activity programmes for groups. Explain safety procedures at the start of sessions and lead groups on adventures and expeditions



'Putting Every Student on the Path to a Happy, Successful and Fulfilling Life'

Year 7 Science Learning Journey

SKEGNESS ACADEMY

Science Mastery

Year 8 Science! Look forward to learning more about scientific enquiry and consolidating your knowledge

P1.3 Energy Transfers

P1.4 Electric Circuits

STEAM Careers
Where can doing well in science lead?....
Radiologist, musician, sound engineer, pilot, architect, civil engineer, mechanical engineer, welder, ambulance technician, dental nurse, accountant, florist, chef, electrician, plumber, photographer, pharmacist…..
The possibilities are endless!!!

C1.3 Mixtures

B1.3 Interdependence

P1.2 Space

Student Development Opportunities in KS3 Science:

STEM Club, help out at Open Evening and special events, Science Week, Competitions

B1.2 Reproduction

C1.2 Atoms, Elements and Compounds

Assessment:
Each term you will complete an End of Term Assessment
At the end of Year 7 you will complete an End of Year Assessment

P1.1 Forces

B1.1 Cells

C1.1 Particles

7

welcome

Online Learning During KS3:

- GCSE Pod is a school subscription, free to access for students: GCSEPod
- Seneca Learning for revision and consolidation materials
- https://senecalearning.com/en-GB/blog/free-key-stage-3-science-revision/
- BBC Bitesize is a collection of revision materials, quizzes and tests that pupils find accessible
- https://www.bbc.com/bitesize/levels/z98jmp3
- Education Quizzes that can be played individually
- https://www.educationquizzes.com/ks3/