Y8 Science Checklist (Term 3)

Electricity (Physics) **https://classroom.thenational.academy/units/electricity-and-magnetism-ab64**	☺	😐	☹
An electromagnet uses the principle that a current through a wire causes a magnetic field. Its strength depends on the current, the core and the number of coils in the solenoid.			
The magnetic force of an electromagnet decreases with distance.			
Use a diagram to explain how an electromagnet can be made and how to change its strength			
Explain the choice of electromagnets or permanent magnets for a device in terms of their properties.			
Critique the design of a device using an electromagnet and suggest improvements.			
Suggest how bells, circuit breakers and loudspeakers work, from diagrams.			
Magnetic materials, electromagnets and the Earth create magnetic fields which can be described by drawing field lines to show the strength and direction. The stronger the magnet, and the smaller the distance from it, the greater the force a magnetic object in the field experiences.			
Two 'like' magnetic poles repel and two 'unlike' magnetic poles attract.			
Field lines flow from the north-seeking pole to the south-seeking pole.			
Use the idea of field lines to show how the direction or strength of the field around a magnet varies.			
Explain observations about navigation using Earth's magnetic field.			
Predict the pattern of field lines and the force around two magnets placed near each other.			
Predict how an object made of a magnetic material will behave if placed in or rolled through a magnetic field.			
KEYWORDS	☺	😐	☹
Electromagnet: A non-permanent magnet turned on and off by controlling the current through it.			
Solenoid: Wire wound into a tight coil, part of an electromagnet.			
Core: Soft iron metal which the solenoid is wrapped around.			
Magnetic force: Non-contact force from a magnet on a magnetic material.			
Permanent magnet: An object that is magnetic all of the time.			
Magnetic poles: The ends of a magnetic field, called north-seeking (N) and south-seeking poles (S).			
Waves (Physics) **https://classroom.thenational.academy/units/sound-waves-0e79**	☺	😐	☹
Sound consists of vibrations which travel as a longitudinal wave through substances. The denser the medium, the faster sound travels.			
The greater the amplitude of the waveform, the louder the sound. The greater the frequency (and therefore the shorter the wavelength), the higher the pitch.			

Sound does not travel through a vacuum.			
The speed of sound in air is 330 m/s, a million times slower than light.			
Explain observations where sound is reflected, transmitted or absorbed by different media.			
Explain observations of how sound travels using the idea of a longitudinal wave.			
Describe the amplitude and frequency of a wave from a diagram or oscilloscope picture.			
Use drawings of waves to describe how sound waves change with volume or pitch.			
Suggest the effects of particular ear problems on a person's hearing.			
Evaluate the data behind a claim for a sound creation or blocking device, using the properties of sound waves.			
Use diagrams to compare the waveforms a musical instrument makes when playing different pitches or volumes.			
Keywords	☺	😐	☹
Vibration: A back and forth motion that repeats.			
Longitudinal wave: Where the direction of vibration is the same as that of the wave			
Volume: How loud or quiet a sound is, in decibels (dB).			
Pitch: How low or high a sound is. A low (high) pitch sound has a low (high) frequency.			
Amplitude: The maximum amount of vibration, measured from the middle position of the wave, in metres.			
Wavelength: Distance between two corresponding points on a wave, in metres.			
Frequency: The number of waves produced in one second, in hertz.			
Vacuum: A space with no particles of matter in it.			
Oscilloscope: Device able to view patterns of sound waves that have been turned into electrical signals			
Absorption: When energy is transferred from sound to a material.			
Auditory range: The lowest and highest frequencies that a type of animal can hear.			
Echo: Reflection of sound waves from a surface back to the listener.			
Earth (Chemistry) **https://classroom.thenational.academy/units/materials-and-the-earth-78e8**	☺	😐	☹
Carbon is recycled through natural processes in the atmosphere, ecosystems, oceans and the Earth's crust (such as photosynthesis and respiration) as well as human activities (burning fuels).			
Greenhouse gases reduce the amount of energy lost from the Earth through radiation and therefore the temperature has been rising as the concentration of those gases has risen			
Scientists have evidence that global warming caused by human activity is causing changes in climate.			
Methane and carbon dioxide are greenhouse gases.			
Earth's atmosphere contains around 78% nitrogen, 21% oxygen, <1% carbon dioxide, plus small amounts of other gases.			
Use a diagram to show how carbon is recycled in the environment and through living things.			
Describe how human activities affect the carbon cycle.			
Describe how global warming can impact on climate and local weather patterns.			
Evaluate the implications of a proposal to reduce carbon emissions.			
Evaluate claims that human activity is causing global warming or climate change.			

Compare the relative effects of human-produced and natural global warming.			
There is only a certain quantity of any resource on Earth, so the faster it is extracted, the sooner it will run out. Recycling reduces the need to extract resources.			
Most metals are found combined with other elements, as a compound, in ores. The more reactive a metal, the more difficult it is to separate it from its compound. Carbon displaces less reactive metals, while electrolysis is needed for more reactive metals.			
Explain why recycling of some materials is particularly important.			
Describe how Earth's resources are turned into useful materials or recycled.			
Justify the choice of extraction method for a metal, given data about reactivity.			
Suggest factors to take into account when deciding whether extraction of a metal is practical.			
Suggest ways in which waste products from industrial processes could be reduced.			
Use data to evaluate proposals for recycling materials.			
Keywords	☺	😐	☹
Global warming: The gradual increase in surface temperature of the Earth.			
Fossil fuels: Remains of dead organisms that are burned as fuels, releasing carbon dioxide.			
Carbon sink: Areas of vegetation, the ocean or the soil, which absorb and store carbon.			
Greenhouse effect: When energy from the sun is transferred to the thermal energy store of gases in Earth's atmosphere.			
Natural resources: Materials from the Earth which act as raw materials for making a variety of products.			
Mineral: Naturally occurring metal or metal compound.			
Ore: Naturally occurring rock containing sufficient minerals for extraction.			
Extraction: Separation of a metal from a metal compound.			
Recycling: Processing a material so that it can be used again.			

REVISION: Y7 Organisms (Biology) **https://classroom.thenational.academy/units/cells-tissues-and-organs-03b2**	☺	😐	☹
Multicellular organisms are composed of cells which are organised into tissues, organs and systems to carry out life processes.			
Specialised cells: There are many types of cell. Each has a different structure or feature so it can do a specific job.			
Describe examples of specialised animal and plant cells.			
Use a light microscope to observe and draw cells.			
Explain what each part of the microscope does and how it is used.			
Carry out **calculations** involving **magnification**, real size and image size using the formula: $\text{magnification} = \frac{\text{size of image}}{\text{size of real object}}$			
Both plant and animal cells have a cell membrane, nucleus, cytoplasm and mitochondria and ribosomes.			
Plant cells also have a cell wall, chloroplasts and usually a permanent vacuole.			
Identify and name some substances that move into and out of cells. Describe the process of diffusion.			
KEYWORDS	☺	😐	☹
Cell: The unit of a living organism, contains parts to carry out life processes.			
Uni-cellular: Living things made up of one cell.			
Multi-cellular: Living things made up of many types of cell.			
Tissue: Group of cells of one type.			
Organ: Group of different tissues working together to carry out a job.			
Diffusion: One way for substances to move into and out of cells.			
Structural adaptations: Special features to help a cell carry out its functions.			
Cell membrane: Surrounds the cell and controls movement of substances in and out.			
Nucleus: Contains genetic material (DNA) which controls the cell's activities.			
Vacuole: Area in a cell that contains liquid, and can be used by plants to keep the cell rigid and store substances.			
Mitochondria: Part of the cell where energy is released from food molecules by aerobic respiration.			
Ribosomes: Part of the cell where proteins are synthesised			
Cell wall: Strengthens the cell. In plant cells it is made of cellulose.			
Chloroplast: Absorbs light energy so the plant can make food.			
Cytoplasm: Jelly-like substance where most chemical processes happen.			
Immune system: Protects the body against infections.			
Reproductive system: Produces sperm and eggs, and is where the foetus develops.			
Digestive system: Breaks down and then absorbs food molecules.			

Circulatory system: Transports substances around the body.			
Respiratory system: Replaces oxygen and removes carbon dioxide from blood.			
Muscular skeletal system: Muscles and bones working together to cause movement and support the body.			
REVISION Y8 Ecosystem (Biology) **https://classroom.thenational.academy/units/plants-and-photosynthesis-54c3**	☺	😐	☹
Plants and algae do not eat, but use energy from light, together with carbon dioxide and water to make glucose (food) through photosynthesis. They either use the glucose as an energy source, to build new tissue, or store it for later use.			
Plants have specially-adapted organs that allow them to obtain resources needed for photosynthesis.			
Describe ways in which plants obtain resources for photosynthesis.			
Explain why other organisms are dependent on photosynthesis.			
Sketch a line graph to show how the rate of photosynthesis is affected by changing conditions.			
Use a word equation to describe photosynthesis in plants and algae.			
Keywords	☺	😐	☹
Fertilisers: Chemicals containing minerals that plants need to build new tissues.			
Photosynthesis: A process where plants and algae turn carbon dioxide and water into glucose and release oxygen.			
Chlorophyll: Green pigment in plants and algae which absorbs light energy.			
Respiration is a series of chemical reactions, in cells, that breaks down glucose to provide energy and form new molecules. Most living things use aerobic respiration but switch to anaerobic respiration, which provides less energy, when oxygen is unavailable.			
Yeast fermentation is used in brewing and bread-making.			
Use word equations to describe aerobic and anaerobic respiration.			
Explain how specific activities involve aerobic or anaerobic respiration.			
Suggest how organisms living in different conditions use respiration to get their energy.			
Describe similarities and differences between aerobic and anaerobic respiration.			
Keywords	☺	😐	☹
Aerobic respiration: Breaking down glucose with oxygen to release energy and producing carbon dioxide and water.			
Anaerobic respiration (fermentation): Releasing energy from the breakdown of glucose without oxygen, producing lactic acid (in animals) and ethanol and carbon dioxide (in plants and microorganisms).			

REVISION : Yr 7 Matter (Chemistry) **https://classroom.thenational.academy/units/particles-f50c**	☺	😐	☹
Properties of solids, liquids and gases can be described in terms of particles in motion but with differences in the arrangement and movement of these same particles: closely spaced and vibrating (solid), in random motion but in contact (liquid), or in random motion and widely spaced (gas).			
Observations where substances change temperature or state can be described in terms of particles gaining or losing energy.			
A substance is a solid below its melting point, a liquid above it, and a gas above its boiling point.			
Explain unfamiliar observations about gas pressure in terms of particles.			
Explain the properties of solids, liquids and gases based on the arrangement and movement of their particles.			
Explain changes in states in terms of changes to the energy of particles.			
Draw before and after diagrams of particles to explain observations about changes of state, gas pressure and diffusion.			
Argue for how to classify substances which behave unusually, as solids, liquids, or gases.			
Evaluate observations that provide evidence for the existence of particles.			
Make predictions about what will happen during unfamiliar physical processes, in terms of particles and their energy.			
Keywords	☺	😐	☹
Particle: A very tiny object such as an atom or molecule, too small to be seen with a microscope.			
Particle Model: A way to think about how substances behave in terms of small, moving particles.			
Diffusion: the process by which particles in liquids or gases spread out through random movement from a region where there are many particles to one where there are fewer.			
Gas pressure: Caused by collisions of particles with the walls of a container.			
Density: How much matter there is in a particular volume, or how close the particles are.			
Evaporate: Change from liquid to gas at the surface of a liquid, at any temperature.			
Boil: Change from liquid to a gas of all the liquid when the temperature reaches boiling point.			
Condense: Change of state from gas to liquid when the temperature drops to the boiling point.			
Melt: Change from solid to liquid when the temperature rises to the melting point.			
Freeze: Change from liquid to a solid when the temperature drops to the melting point.			
Sublime: Change from a solid directly into a gas.			

REVISION Y8 Matter (Chemistry) **https://classroom.thenational.academy/units/atoms-and-the-periodic-table-68d3**	☺	😐	☹
Most substances are not pure elements, but compounds or mixtures containing atoms of different elements. They have different properties to the elements they contain.			
Use particle diagrams to classify a substance as an element, mixture or compound, and as molecules or atoms.			
Name simple compounds using rules: change non-metal to –ide; mono, di, tri prefixes; and symbols of hydroxide, nitrate, sulfate and carbonate.			
The symbols of hydrogen, oxygen, nitrogen, carbon, iron, zinc, copper, sulfur, aluminium, iodine, bromine, chlorine, sodium, potassium, magnesium.			
Name compounds using their chemical formulae.			
Given chemical formulae, name the elements present and their relative proportions.			
Represent atoms, molecules and elements, mixtures and compounds using particle diagrams.			
Use observations from chemical reactions to decide if an unknown substance is an element or a compound.			
Keywords	☺	😐	☹
Elements: what all substances are made up of, and which contain only one type of atom.			
Atom: The smallest particle of an element that can exist.			
Molecules: Two to thousands of atoms joined together. Most non-metals exist either as small or giant molecules.			
Compound: Pure substances made up of two or more elements strongly joined together.			
Chemical formula: Shows the elements present in a compound and their relative proportions.			
Polymer: A molecule made of thousands of smaller molecules in a repeating pattern. Plastics are man-made polymers, starch is a natural polymer.			
REVISION Y7 Energy (Physics) **https://classroom.thenational.academy/units/energy-0b08**	☺	😐	☹
We can describe how jobs get done using an energy model where energy is transferred from one store at the start to another at the end.			
When energy is transferred, the total is conserved, but some energy is dissipated, reducing the useful energy.			
Describe how the energy of an object depends on its speed, temperature, height or whether it is stretched or compressed.			
Show how energy is transferred between energy stores in a range of real-life examples.			
Calculate the useful energy and the amount dissipated, given values of input and output energy.			

Explain how energy is dissipated in a range of situations.			
Compare the percentages of energy wasted by renewable energy sources.			
Explain why processes such as swinging pendulums or bouncing balls cannot go on forever, in terms of energy.			
Evaluate analogies and explanations for the transfer of energy			
Keywords	☺	😐	☹
Thermal energy store: Filled when an object is warmed up.			
Chemical energy store: Emptied during chemical reactions when energy is transferred to surroundings.			
Kinetic energy store: Filled when an object speeds up.			
Gravitational potential energy store: Filled when an object is raised.			
Elastic energy store: Filled when a material is stretched or compressed.			
Dissipated: Become spread out wastefully.			
We pay for our domestic electricity usage based on the amount of energy transferred.			
Electricity is generated by a combination of resources which each have advantages and disadvantages.			
Calculate the cost of home energy usage, using the formula: cost = power (kW) x time (hours) x price (per kWh).			
Food labels list the energy content of food in kilojoules (kJ).			
Compare the amounts of energy transferred by different foods and activities.			
Compare the energy usage and cost of running different home devices.			
Explain the advantages and disadvantages of different energy resources.			
Represent the energy transfers from a renewable or non-renewable resource to an electrical device in the home.			
Evaluate the social, economic and environmental consequences of using a resource to generate electricity, from data.			
Suggest actions a government or communities could take in response to rising energy demand.			
Suggest ways to reduce costs, by examining data on a home energy bill.			
Keywords	☺	😐	☹
Power: How quickly energy is transferred by a device (watts).			
Energy resource: Something with stored energy that can be released in a useful way			
Non-renewable: An energy resource that cannot be replaced and will be used up.			
Renewable: An energy resource that can be replaced and will not run out. Examples are solar, wind, waves, geothermal and biomass.			
Fossil fuels: Non-renewable energy resources formed from the remains of ancient plants or animals. Examples are coal, crude oil and natural gas.			

REVISION Y8 Electricity (Physics) **https://classroom.thenational.academy/units/electricity-and-magnetism-ab64**	☺	😐	☹
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