

Year 11 Term 2 Knowledge Organiser



Science Knowledge Organiser

	Topic:	Types of bonding (C.7)
1	Which type of bonding occurs between metals and non-metals?	Ionic
2	Which type of bonding occurs between non-metals?	Covalent
3	Which type of bonding occurs between metals?	Metallic
4	When electrons leave the shells of an atom, they are said to be?	Delocalised
5	Which type of ions are formed by metals?	Positive ions
6	Which type of ions are formed by non-metals?	Negative ions
7	What is graphene?	A single layer of graphite
8	What is a fullerene?	Hollow carbon structures
9	What is Buckminster Fullerene?	Spherical carbon shape with 60 carbon atoms
10	What is an allotrope?	Two or more different physical arrangements of the same atom e.g. diamond, graphite, graphene
11	What is a carbon nanotube?	A cylindrical fullerene with a very high length to diameter ratio
12	Describe what happens in ionic bonding	Electrons are transferred from a metal atom to a non-metal atom = strong electrostatic attraction between oppositely charged ions
13	Describe what happens in covalent bonding	Electrons are shared between atoms = strong electrostatic attraction between electrons and nucleus
14	Describe what happens in metallic bonding	Electrons become delocalised creating a sea of negative charge = strong electrostatic attraction with positive metal ions & sea of delocalised electrons
15	Why do noble gases not form compounds?	Because they already have a full outer shell of electrons

	Topic:	The Earth's Early Atmosphere (C.20)
1	When did the Early Atmosphere form?	4.6 billion years ago
2	State the four gases present in the Early Atmosphere?	Carbon dioxide (70%), methane (10%), ammonia (10%) and water vapour (10%)

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3	Where did the gases in the early atmosphere come from?	Volcanic activity
4	What are the 2 most prevalent gases in the atmosphere today?	Nitrogen (78%) and Oxygen (21%)
5	How much carbon dioxide is there in the Earth's atmosphere today?	0.0004
6	State the substances that have trapped carbon dioxide under the ground	Fossil Fuels and Sedimentary rocks
7	Name the process by which the oceans are thought to have formed	Condensation of water vapour
8	Where do our current levels of nitrogen come from?	Volcanoes
9	Name the process that converts carbon dioxide into oxygen.	Photosynthesis
10	Which organism is responsible for releasing nitrogen from plants?	Bacteria
11	State the naturally occurring phenomenon that is believed to have converted gases into nitrogen?	Lightening
12	State the process that releases nitrogen from organisms on death	Decomposition
13	State the 4 processes that lead to a reduction in CO ₂ between the Early Atmosphere and today.	1) Dissolved in seas 2) Trapped in rocks 3) Photosynthesis 4) Trapped in fossil fuels
14	Name the process that caused an increase in oxygen levels	Photosynthesis
15	Which two organisms caused an increase in oxygen levels?	Algae and green plants
	Topic:	Global warming and air pollution (C.21)
1	Name the 3 greenhouse gases	Water, Methane, carbon dioxide
2	Name the greenhouse gas produced by rice fields	Methane (CH ₄)
3	Name the three types of radiation emitted by the sun	Infrared (long wave), visible light (short wave) and UV (short wave)
4	Name the one type of radiation emitted by the Earth	Infrared radiation (long wave)
5	What happens to the majority of radiation emitted by the sun when it gets to the Earth's atmosphere?	It passes through (is transmitted)
6	What happens to the majority of radiation emitted by the Earth when it reaches the atmosphere?	It is absorbed
7	State 2 human activities that increase the amount of carbon dioxide in the atmosphere	Burning fossil fuels, deforestation
8	State 3 human activities that increase the amount of methane in the atmosphere	Decaying organic matter, growing rice, cattle farming
9	Why is global climate change difficult to model?	Involves many factors
10	What is the main cause of global climate change?	Increase in average global temperature
11	State 6 potential effects of global climate change	1) Ice caps melting 2) Sea level rising 3) Loss of habitats 4) Desertification 5) Changes in migratory patterns 6) Drought

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12	Define 'carbon footprint'	The total amount of CO ₂ and other greenhouse gases emitted over the full life cycle of a produce, service or event
13	State three ways we can reduce our carbon footprint?	1) recycle 2) take public transport 3) use renewable energies
14	State two effect of carbon particulates (soot) being released into the atmosphere	Global dimming & asthma
15	State the effect of sulphur dioxides and nitrogen oxides being released into the atmosphere	Acid rain & respiratory problems
	Topic:	Finite resources, water and waste (C.22)
1	State 4 factors that humans use the Earth's resources for	Warmth, Shelter, Food, Transport
2	State 4 products gained from the Earth	Food, Timber, Clothing, Fuel
3	Define "finite"	Will run out
4	Define "sustainable development"	Development that meets the needs of the current generation without compromising the ability to meet the needs of future generations
5	State two examples of synthetic materials that are replacing natural materials	Artificial leather, Synthetic rubber
6	What is the name given to water that is safe to drink?	Potable
7	State the two stages of making potable water from a lake or river	1) Filter bed 2) Sterilise (with chlorine) 3) Add fluoride
8	Why is fluoride added to drinking water?	Reduce tooth decay
9	State three things that can be used to sterilise water	UV, ozone, chlorine
10	State two ways that desalination can be carried out	Reverse osmosis or distillation
11	State one disadvantage of desalination.	Requires large amounts of energy
12	Is potable water pure?	No, it contains lots of minerals
13	Describe the two steps in desalination	1) Heat water (evaporation) 2) Cool (condensation)
14	State the 4 stages of waste water treatment	1) Screening, 2) Sedimentation, 3) Anaerobic digestion (sewage), 4) Aerobic biological treatment (effluent)
15	What are the 4 stages of an LCA?	1) Extracting & processing raw materials 2) Manufacturing and packing 3) Use during it's life 4) Disposal
	Topic:	RP: Water purification (C8) (C.42)
1	What is the aim of experiment 1?	To determine if a sample of water is pure
2	What is the independent variable?	The sample of water
3	What is the dependent variable?	pH and mass of dissolved solids

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4	Name the control variable	Volume of water
5	How is the pH of the samples tested?	Using universal indicator
6	What should the pH be?	7 (green)
7	How do we test for dissolved solids?	1) Weigh an empty evaporating basin 2) Fill evaporating basin with water sample 3) Heat gently using Bunsen burner 4) Re-weight basin once water has evaporated
8	If water contains dissolved solids (is impure) what would we see?	The mass of the basin would increase
9	What is the aim of experiment 2?	To purify a sample of water to make it potable
10	What process can be used to purify water?	Distillation
11	Name the changes in state that occur during distillation	Evaporation --> condensation
12	How is the water evaporated?	Heating the conical flask gently
13	How is evaporated water collected?	Using a delivery tube and bung
14	How is the water condensed back into a liquid?	Placing the test tube in a beaker of iced water
15	How can we test if the water is pure?	Use cobalt chloride paper to test whether the substance is water (it will turn blue -> pink).

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