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| Subject: Science Year 8 Curriculum Map 2022-2023 |
| Terms | **Topics covered** and **core knowledge and skills** | Links to careers | Links to the Knowledge organiser and other additional resources |
| Term 1 | **Sports Science*** On a diagram of the skeleton label the position of the femur, scapula, tibia, fibula, sternum and cranium.
* State the role of the Skelton as to a) provide structure b) allow movement and c) produce red blood cells.
* Identify the elbow and ankle as a hinge joint.
* Identify the shoulder and hip as ball and socket joints.
* State the 3 blood vessels as veins, arteries and capillaries.
* On a diagram of the heart label the left and right ventricle.
* On a diagram of the heart label the left and right atrium.
* Describe how the artery is adapted for its function by stating it has a thick muscular wall
* Describe how the vein is adapted for its function by stating it has a large lumen and contains valves
* Identify O2, CO2, and glucose as substance that move in and out of capillaries into cells
* Label on a diagram of the lungs the position of the alveoli, bronchus, bronchioles, trachea, diaphragm and ribs.
* Give the equation for anaerobic respiration in mammals as
	1. *Glucose  Lactic acid*
* Give the equation for aerobic respiration in mammals as
	1. *Glucose + Oxygen  Carbon dioxide + Water*
* State that the HR increases during exercise
* Describe the changes in HR during exercise in relation to increased blood flow (glucose, oxygen, carbon dioxide) and respiration.
* Define health as (See L12)
* Define non communicable disease as (See L12)
* Define Fitness as (See L12)
* Give Caffeine and Cocaine as examples of stimulant drugs
* State smoking as a risk factor for lung cancer
* State high fat diet as a risk factor for Coronary Heart Disease
* State a lack of exercise as a risk factor for diabetes and Coronary heart disease

**Astrophysics** * Describe examples of jobs within the Earth and space science industries.
* Name the main layers of the Earth.
* State features commonly found near tectonic plate boundaries
* Describe the formation of sedimentary, metamorphic, and igneous rocks and their resulting features
* Label a diagram of the rock cycle with the names of the key processes
* Recall the composition of Earth’s atmosphere (dry)
* Name processes that changed the composition of Earth’s atmosphere
* Label a diagram of the carbon cycle, naming the major processes
* Define ‘satellite’
* Categorise satellites as artificial or natural
* Describe some ways that politics have affected space exploration
* Describe some of the challenges of establishing colonies on Mars
* Name objects in the Solar System
* Classify objects as rocky planets, gas giants, or dwarf planets
* Describe the difference between weight and mass
* Recall and use the equation *weight = mass x gravitational field strength*
* Recall the order of the planets in the Solar System, starting nearest the Sun
* Give the reason that scientific models change
* Describe meteors, asteroids, and comets
* State how the Earth’s rotation causes day and night
* State how the Earth’s orbit causes seasons
* Define ‘universe’
* Describe stars
* Explain how the death of a large star led to heavy elements necessary for Earth to form
* Explain why life is likely to exist elsewhere in the universe, but is unlikely to be able to make contact
* **Science Skills Year 8**Definitions of the different variables and be able to identify examples.
* Draw a basic results table.
* Identify anomalies in data.
* Understand what to do with anomalies in data.
* Calculate mean, mode, range and median.
* Round data to the correct number of significant figures and decimal places.
* Identify when data should be plotted as a bar chart or line graph.
* Plot the two different types of graphs.
* Draw lines of best fit.
* Calculate % increase and decrease in values.
* Calculate volume of regular and irregular objects.
* Express ratios in their simpliest form.
* State SI units for different scientific experiments.
 | [Sport Science Careers](https://www.surrey.ac.uk/features/top-jobs-sport-and-exercise-science-degree)[Chemical Engineering](https://www.prospects.ac.uk/careers-advice/what-can-i-do-with-my-degree/chemical-engineering) | <https://maritime.rivoagency.com/admin/wp-content/uploads/sites/20/2022/10/Sport-Science-KO.pdf><https://maritime.rivoagency.com/admin/wp-content/uploads/sites/20/2022/10/Astrophysics-KO.pdf><https://maritime.rivoagency.com/admin/wp-content/uploads/sites/20/2022/10/Year-8-Into-to-sci-KO.pdf> |
| Term 2 | **Renewable engineering**Describe examples of jobs within the renewable energy sector. * Define the terms ‘thermal conductor’ and ‘thermal insulator’.
* Describe conduction, convection, and radiation.
* Simply describe how a coal power station works.
* Describe combustion as an oxidation reaction, and state the requirements for it to occur.
* Define the term ‘greenhouse gas’
* Describe the evidence for human caused climate change.
* Define ‘renewable’ and ‘non-renewable’ energy sources, giving examples of each.
* Describe how electricity is generated at a hydroelectric power station.
* Describe how electricity is generated by a solar cell, and name some factors that affect the power output.
* Describe how electricity is generated by a wind turbine, and name some factors that affect the power output.
* Give the advantages and disadvantages of a range of energy resources.
* Define power.
* Recall and apply the equation: *power = energy transferred ÷ time taken*
* Calculate the cost of using an electrical appliance.
* **Forensic Science**
* Describe what forensic science is
* Describe what Locard’s exchange is.
* State different examples of forensic evidence.
* Compare the difference between a pure and impure substance
* Describe the results shown by a pure and impure solution when boiled
* Describe the chromatography method
* Correct use of significant figures when presenting data
* Define and describe the process of evaporation
* Define the term salt
* Describe how to name salts
* State the results from different flame tests.
* Describe how to complete a handwriting analysis
* Describe how insects can give approximate time of death
* Define the term precipitate
* Describe how to test for specific metal ions
* State what DNA is and why it is unique
* Comparisons between random and systematic error
 | [Careers in Engineering](https://www.prospects.ac.uk/jobs-and-work-experience/job-sectors/engineering-and-manufacturing/5-exciting-careers-in-engineering)[Careers in Forensic Science](https://ifflab.org/branches-of-forensic-science/) | <https://maritime.rivoagency.com/admin/wp-content/uploads/sites/20/2022/10/Environmental-Science-KO.pdf><https://maritime.rivoagency.com/admin/wp-content/uploads/sites/20/2022/10/Forensic-Science-KO.pdf> |
| Term 3 | **Environmental science*** State what a food chain shows.
* Identify producers, primary, secondary and tertiary consumers in a food chain & construct them.
* State what animal & plants compete for.
* Describe ways animals & plants depend on each other.
* Describe the structure, function & location of DNA.
* Define the terms dominant and recessive alleles.
* Draw simple genetic diagrams.
* Calculate the Percentage/probability outcomes of a genetic diagram.
* State what variation is and what factors cause it.
* Compare inherited and environmental variation.
* Order the classification system.
* Describe what the bi-nomial naming system is and identify the bi-nomial names of different organisms.
* Define the term evolution.
* Describe simply the process of natural selection
* Define the term extinction.
* Describe factors which contribute to species becoming extinct
* State what a fossil is.
* Describe how fossils are formed.
* State what biodiversity means and why biodiversity is important in an ecosystem.
* Name different atmospheric pollutants.

**Cosmetic science*** Describe what a cosmetic scientist is.
* Define what a formulation is.
* Recall what a mixture is.
* Describe how the size of a molecule affects its boiling/melting point and viscosity.
* State some examples of some acids and alkalis.
* State what an indicator is.
* Label the pH scale.
* Describe a range of physical properties of a substance.
* Describe what happens in a neutralisation reaction.
* Write the word equation for neutralisation.
* Identify variables.
* Label the equipment needed for distillation.
* Describe the different stages of distillation.
* Identify the uses of the different colour theory models.
* Describe what primary, secondary and tertiary colours are.
* Describe the different types of tests on animals.
* Describe what is meant by cruelty free.
* Describe the different types of alternatives to animal testing.
* Describe different ways ancient civilisations created cosmetics.
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