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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. | [Environmental science](htps://www.prospects.ac.uk/careers-advice/what-can-i-do-with-my-degree/environmental-science)  [Cosmetic science](https://www.scs.org.uk/content.aspx?pageid=490) | <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/Cosmetic-science-KO.pdf> |