

Summary Tool for Stage 5 Science

Stage 5 syllabus outcomes	Important words	Revision
<p>5.6 Applies basic physical models, theories and laws to situations involving energy, force and motion. Students will learn about:</p> <p>5.6.1 the wave model to:</p> <p>a) identify <i>waves</i> as carriers of <i>energy</i>.</p> <p>b) qualitatively describe features of waves including <i>frequency</i>, <i>wavelength</i> and <i>speed</i>.</p> <p>c) give examples of different types of radiation that make up the <i>electromagnetic spectrum</i>.</p>	<p>Wave Energy Transverse wave Compression wave Frequency Hertz Wavelength Amplitude Speed Electromagnetic spectrum Light Gamma rays X-rays Ultra violet Waves Visible light Infra-red Microwaves Radio Television Vacuum Communication Optic fibres</p>	<p>Complete the sentences below. Some words are not in the previous list but can be found in your science notes or text book.</p> <ol style="list-style-type: none"> A wave is defined as a carrier of e_____. A wave that involves the energy travelling at right angles to the up and down vibration of particles is called a t_____ wave, eg. water. L_____ is another example of this kind of wave. A wave that involves the particles of the medium vibrating backwards and forwards in the direction the energy is moving is called a c_____ wave, eg. sound waves. The speed of sound is much less than the speed of l_____ energy which explains why lighting is seen before the thunder is heard during a storm. F_____ is the term that describes the number of waves passing a given point in one second. It is measured in h_____ (Hz). One h_____ describes one vibration per second or one wave per second. The top of a transverse wave is called the c_____. The bottom of a transverse wave is called a t_____. The a_____ of a wave is the maximum distance to the top or bottom of a wave ie the crest or a trough. The w_____ of a wave is the distance between any two points in the same phase of motion of the wave such as the distance between two crests of a wave. Ultra violet, visible light and radio waves are just three forms of energy that belong to the e_____ s_____. All forms of energy in the electromagnetic spectrum travel at the same speed of _____ Km/sec. The form of electromagnetic energy that has the highest frequency and smallest wavelength is g_____. Three forms of energy of the electromagnetic spectrum that may damage living tissue are g_____, X_____ and u_____. Waves of electromagnetic energy can travel through a v_____ like space but sound energy cannot because it can only travel through a m_____. X_____ can be used for diagnosis of bone fractures. Radio, television and microwaves can be used by man for c_____. Another form of electromagnetic energy that can be used as in Number 14 is l_____ which is taken advantage of in o_____ f_____ technology where messages are sent in the form of pulses along a fibre glass. <p style="text-align: center;">***</p>
<p>5.6.2 Newton's Laws of motion to:</p> <p>a) describe qualitatively the relationship between <i>force</i>, <i>mass</i> and <i>acceleration</i>.</p> <p>b) explain qualitatively the relationship between <i>distance</i>, <i>speed</i> and <i>time</i>.</p>	<p>Force Mass Acceleration Decelerating Distance Time Newton's first law</p>	<ol style="list-style-type: none"> Sir Isaac Newton is famous for his laws of m_____ and also explaining that the planets of the solar system are kept in orbit by the force of g_____. Newton's first law of motion states that an object will remain at r_____ or will not change its s_____ or d_____ unless it is acted upon by an outside, unbalanced force. This law of motion is also known as the law of i_____. Inertia is the property of objects that makes them resist c_____ motion. Newton's second law of motion describes how force depends upon the m_____ of an object and its a_____. Ie $F = ma$.

<p>c) relate qualitatively acceleration to a change in speed and/or direction as a result of a net force.</p> <p>d) analyse qualitatively common situations involving motion in terms of Newton's Laws.</p>	<p>Inertia Speed Time Direction Newton's second law Newton's third law Joule Kilojoule</p>	<p>6. Force is measured in a unit called the n_____.</p> <p>7. Newton's third law of motion states that _____.</p> <p>8. The use of seatbelts in moving cars helps overcome Newton's _____ law of motion or _____ in an accident.</p> <p>9. The launch of a space shuttle relies upon Newton's _____ law of motion.</p> <p>10. S_____ is a measure of the rate at which an object moves over a distance.</p> <p>11. The average speed of an object is determined by dividing the d_____ travelled by the t_____ taken.</p> <p>12. The term v_____ is often used to describe how fast objects are moving but this term is different from speed because it involves direction.</p> <p>13. When determining velocity, the d_____ of the moving object is very important which is not important when determining speed.</p> <p>14. A moving object may increase its velocity or decrease its velocity. The term a_____ is a measure of the rate at which the moving object changes velocity.</p> <p>15. If acceleration is positive, then the object is moving f_____.</p> <p>16. If acceleration is negative, then the object is s_____ d_____ which is called d_____.</p> <p>17. If oil spots on the road from a car are getting further apart, then the car must be a_____.</p> <p>18. If the oil spots on the road start to get closer, then the car must be s_____ d_____ or d_____.</p> <p>19. When a force is applied to an object to make it move, then work is done.</p> <p>20. Work = f_____ x d_____.</p> <p>21. The unit used to measure work or energy is the j_____ or k_____.</p> <p style="text-align: center;">***</p>
<p>5.6.3 electrical energy to:</p> <p>a) design, construct and draw circuits containing a number of components.</p> <p>b) describe voltage, resistance and current using analogies.</p> <p>c) describe qualitatively the relationship between voltage, resistance and current.</p> <p>d) compare the characteristics and applications of series and parallel circuits.</p>	<p>Circuit Parallel Series Voltage Current Direct current Alternating current Resistance Switch Battery Ohm Ampere Ammeter Voltmeter Volt Conductor Insulator V=IR</p>	<p>1. Which atomic particle is involved in the flow of electricity in a wire? E_____</p> <p>2. An electric circuit in its simplest form consists of a power supply eg a b_____ and a w_____ as the conducting pathway that allowed electrons to flow around the circuit.</p> <p>3. A simple electric cell can be used to convert chemical energy into e_____ energy. It is simply made of two different metals dipping into a liquid that carries electricity called an e_____. Eg a copper nail and an iron nail connected by a wire and placed in a lemon.</p> <p>4. A good carrier of electricity is called a e_____ of electricity. One example is the commonly used metal called c_____.</p> <p>5. An electric current will not flow through an i_____ such as plastic or paper.</p> <p>6. A s_____ in a circuit controls whether or not the electric current flows.</p> <p>7. Voltage is measured in v_____ using an instrument called a v_____.</p> <p>8. Voltage (V) depends upon the strength of the:</p> <p>a) Current (I) going through an electrical component which is measured in a_____ with an instrument called an a_____.</p> <p>b) Resistance (R) of an electrical component in a circuit which is measured in O_____.</p> <p>9. The formula of equation that describes the relationship between voltage, current and resistance is _____.</p> <p>10. The r_____ of a part of an electric circuit, eg light globe, is a measure of how difficult it is for electrons to flow through that part of the circuit.</p> <p>11. Good conductors of electricity eg metals, have very little r_____.</p> <p>12. When all components of a circuit are in one direct pathway, they are said to be connected in s_____.</p> <p>13. Lighting in your house is connected in p_____ so that when one light blows, the others can continue to glow.</p> <p>14. The power in your house relies on current that goes backward and forward in an a_____ c_____ or AC.</p> <p>15. Draw the symbol for a battery in a circuit. _____</p> <p>16. Draw the symbol for a switch in an electric circuit. _____</p> <p>17. Draw the symbol for a lamp in a circuit. _____</p> <p>18. Draw a symbol for an ammeter in a circuit. _____</p> <p>19. Draw a simple electric circuit that includes the symbols for battery, switch, lamp and ammeter connected in series.</p>

<p>5.6.4 light energy to: a) distinguish between the <i>absorption, reflection</i> and <i>refraction</i> of light and identify everyday situations where each occurs.</p>	<p>Reflection Transparent Translucent Opaque Refraction Concave lens Convex lens Absorption Scattering Spectrum Dispersion</p>	<p style="text-align: center;">***</p> <ol style="list-style-type: none"> When light rays bounce off a surface, we say that r_____ has occurred. We see objects because light is r_____ from the objects to our eyes The range of colours in white light is known as a s_____. White light is separated into its colours by the process called d_____. White light is made up of many colours which are _____. An object appears g_____ in colour because it reflects green light to our eyes. An object appears white if it reflects a___ colours of the light. An object appears b_____ if it absorbs all colours of light. Light rays can be reflected in many different situations, this is called s_____ of light. We cannot see objects clearly on f_____ mornings because the small water droplets in the air scatter the light. Light enters the eye or a camera and forms an i_____ of an object on the retina of the eye or the film of the camera. An object is t_____ if it allows light to pass through it so objects on the other side can be seen clearly. An object is t_____ if it allows some light through but the objects cannot be clearly seen on the other side. Eg the frosted g_____ in a shower screen. An object is describes as o_____ if it does not allow light through so that objects on the other side cannot be seen. A fish observed in water from the above surface is not where it really is due to r_____ of the light rays as they pass from the water to the air. C_____ and c_____ lenses are two types of lenses that are commonly used for refracting light. A magnifying glass is an example of a c_____ lens.
<p>5.6.5 nuclear energy to: a) identify that <i>energy</i> and <i>particles</i> may be released from the nuclei of atoms.</p>	<p>Radio activity Alpha particle Beta particle Nuclear fusion Nuclear fission Natural radioactivity Half-life</p>	<p style="text-align: center;">***</p> <ol style="list-style-type: none"> When an atom in unstable, we say it is r_____. There are three different kinds of radiations released by unstable atoms: <ol style="list-style-type: none"> a_____ particles which are p_____ charged particles that cannot penetrating very far in air. b_____ particles which are very small, n_____ charged, f_____ moving particles. g_____ rays which are extremely dangerous due to high penetration. N_____ r_____ is emitted by elements like u_____ in the Earth's c_____. An artificially made radioactive element is called a radioisotope. Name one radioisotope. The time taken from the radioactive substance uranium to change to half its mass or half its radioactivity is called its h_____ which is about 4.6 billion years, the age of the E_____.
<p>5.6.6 gravitational force to: a) distinguish between the terms '<i>mass</i>' and '<i>weight</i>'.</p>	<p>Mass Weight Gravity Force Newton distance</p>	<p style="text-align: center;">***</p> <ol style="list-style-type: none"> The m_____ of an object refers to the amount of matter contained in the object and is measured in k_____. The w_____ of an object is defined as the force of Earth's gravitational pull on the object. Force is simply a p_____ or a p_____ which is measured with a unit called a n_____. A person standing on the Moon will have the same m_____ as on Earth but a different w_____ because the Moon's gravity is l_____ than Earth's gravity. The force of gravity decreases as the d_____ between two objects increases. The greater the m_____ of an object, the greater its force of gravity, When an object falls from a height, its acceleration due to gravity its approximately _____ ms⁻² (metres/sec/sec)

5.7 Relates properties of elements, compounds and mixtures to scientific models, theories and laws. Students will learn about:

5.7.1 atomic theory to:

- describe features of and the location of *protons*, *neutrons* and *electrons* in the atom.
- distinguish between *elements*, using information about the numbers of *protons*, *neutrons* and *electrons*.
- identify the *properties of different substances* that can be explained in terms of their subatomic structure.
- describe an appropriate *model* that has been developed to describe atomic structure.

5.7.2 elements to:

- identify the atom as the smallest unit of an element and distinguish between *atoms* and *molecules*.
- describe some relationships between elements using the *Periodic Table*.

5.7.3 compounds and reactions to:

- identify that a new compound is formed by *rearranging* atoms rather than by creating matter.
- classify compounds* into groups based on common chemical characteristics.
- construct *word equations* from observations and written descriptions of a range of chemical reactions.
- identify a range of common *compounds* using their *common names* and *chemical formulae*.

Atom
Molecule
Proton
Neutron
Electron
Mendeleev
Element
Compound
Mixture
Atomic number
Mass number
Combustion
Noble gas
Reactants
Products
Precipitate
Precipitation
Decomposition
Corrosion
Chemical formula
Sulphuric acid
Hydrochloric acid
pH
Indicator
Base
Alkali
Limewater
Neutralisation
Salt
Universal indicator
Phenolphthalein
Litmus
Created
Destroyed
Acidic
Alkaline
Basic

- The smallest unit of an element that exists naturally is an **a**_____.
- A **m**_____ is a particle consisting of two or more atoms joined together. Eg CO₂, H₂O, O₂.
- Atoms consist of protons, neutrons and electrons. The current accepted idea of the structure of an atom is known as a model.
- Describe the accepted idea or model about the structure of an atom.

- What 2 atomic particles make up the nucleus of the atom? **p**_____, **n**_____
- Which atomic particle orbits around the nucleus of the atom? **e**_____
- Which atomic particle had a positive charge? **p**_____
- Which atomic particle has no charge at all? **n**_____
- Which atomic particle has a negative charge? **e**_____
- The periodic table was first developed by a Russian scientist called **M**_____.
- Are there more metals or non-metals in the periodic table? _____
- A *group* on the periodic table refers to a **v**_____ arrangement of elements.
- A *row* on the periodic table refers to a **h**_____ arrangement of elements.
- Elements in the periodic table **increase in atomic number** from the simplest element to the most complex.
- What is the simplest element? _____
- What is its atomic number? _____
- What is the second simplest element? _____
- What is its atomic number? _____
- The atomic number of an element tells is the number of **p**_____ in its atom.
- The elements on the Periodic Table are arranged in order of **a**_____ **n**_____.
- An atom with no electric charge always has equal numbers of **p**_____ and **e**_____.
- The mass number of an element is the total number of protons and neutrons in the nucleus of its atom. Use your periodic table to find the name of the element that has a mass number of 238 and 146 neutrons. (Hint: do a subtraction to determine the number of protons).
- When an atom becomes electrically charged, only the **e**_____ will change in number.
- A positively charged atom is formed by the **l**_____ of **e**_____. In other words, this atom has more **p**_____ than **e**_____.
- A negatively charged atom is formed by the **g**_____ of **e**_____. In other words, this atom has more **e**_____ than **p**_____.
- An atom has an atomic number of 17. If the first energy level or shell can only contain 2 electrons and the second shell only 8 electrons, how many electrons will be in each energy level or shell in the atom? _____
- A noble gas will not take part in chemical changes because each electron shell is completely full. Name one noble gas from the periodic table. _____.
- Name another element from the periodic table that will have similar properties to the element sodium. _____
- Describe one chemical property of the active metal sodium. _____
- Write the name of the elements that have the following symbols.
Na _____, K _____, Cu _____, Fe _____, Pb _____
- Write the symbol for the following elements.
Silver ____, Aluminium ____, Sulfur ____, Zinc ____, Helium ____
- Complete the following sentences about kinds of substances:
a) An **e**_____ consists of identical atoms and cannot be broken down into anything simpler.
b) A **c**_____ is made up of particles with two or more atoms of different elements chemically bonded together in definite proportions.
c) A **m**_____ consists of any number of substances in any proportion by weight.
- Use the names of the substances above to classify the following materials.
Water _____, Carbon _____, Soil _____, Carbon Dioxide _____, Air _____,
Copper Sulfate _____, Seawater _____, Sodium Chloride _____

- e) qualitatively describe **reactants** and **products** in the following chemical reactions:
- combustion
 - corrosion
 - precipitation
 - acids on metals and acids on carbonates
 - neutralisation
 - decomposition
- f) describe the role of **indicators**.

34. Name the following common substances.
 NaCl _____, HCl _____, NaOH _____, CuSO₄ _____,
 H₂SO₄ _____, H₂ _____, C₆H₂O₆ _____ (produced by photosynthesis),
 O₂ _____, CO₂ _____
35. The chemical formula of a substance involves what **e** _____ are present and the **n** _____ of atoms for each element.
36. Name the elements and how many atoms of each element are present in the substance K₃PO₄.

37. Complete the following word equation by naming the compound formed when magnesium burns in the presence of oxygen in air.
 Magnesium + Oxygen \longrightarrow _____
38. Write the chemical formula of this compound above. _____
39. The substances that react together on the left-hand side of the arrow of an equation are called **r** _____.
40. The substances formed on the right-hand side of the equation are called **p** _____.
41. The Law of Conservation of Mass states that matter is never **c** _____ or **d** _____.
42. Which kind of element goes first in the name of the compound calcium carbonate? **M** _____
43. **General Rule** - When a metal and a non-metal chemically combine, the compound formed is named by the following:
 The **m** _____ is written first and the non-metal is written last but its ending becomes changed to '**i** _____'
44. Name the compound formed by the chemical combination of:
 a) iron and sulphur _____
 b) chlorine and magnesium _____
45. When new substances are formed as a result of a chemical change, a rearrangement of the **a** _____ occurs rather than new matter being **c** _____.
46. When the compound calcium carbonate is strongly heated, it breaks down to produce simpler substances of calcium oxide and carbon dioxide, this 'breaking down' chemical reaction is called **d** _____.
47. The presence of carbon dioxide can be demonstrated by its reaction with **l** _____ which turns milky.
48. The name of the chemical reaction involving burning in the presence of oxygen is called **c** _____.
49. Metals may undergo a very slow process of combining with oxygen. This process is commonly called **c** _____.
50. Rusting is an example of this process but it only involves the metal called **i** _____.
51. One example of a metal which would not undergo this process because it is chemically inactive is **g** _____.
52. What gas is produced when a dilute acid reacts with a chemically active metal like magnesium? **h** _____
53. Describe the test that you would use to indicate the presence of the gas above.

54. When iron is placed in copper sulphate solution, it rapidly goes reddish brown which cannot be reversed, is this a chemical change or physical change? _____
55. What gas is produced when an acid reacts with a carbonate like calcium carbonate? **c** _____
56. Name a rock which would react with acid as above because it is made of calcium carbonate. **L** _____
57. When the process of neutralisation occurs, an acid reacts with a **b** _____ or **a** _____.
58. Is caustic soda a base or an acid? _____
59. The chemical name for caustic soda is **s** _____ **h** _____.
60. An aqueous solution (dissolved in water) of a base is called an **a** _____.
61. What 2 compounds are produced by neutralisation? A **s** _____ and **w** _____.
62. When sodium hydroxide and hydrochloric acid react together, they form a salt called **s** _____ **c** _____.
63. Name one chemical indicator used in the laboratory other than universal indicator. _____
64. Name one source of a naturally occurring indicator. _____
65. What colour does universal indicator turn in the presence of an acid? _____
66. What colour does universal indicator turn in the presence of an alkali? _____

		<p>67. If universal indicator is green before adding it to an acid or alkali, what would the colour be when testing the products of neutralisation? _____</p> <p>68. Everyday uses of indicators are: testing the pH or acidity of water in your s_____ p_____ and how acidic or alkaline the garden s_____ is.</p> <p>69. The pH scale ranges from 1 to 14. A substance with a pH of 2 would be classed as a_____ c and a substance with a pH of 1 would be classed as a_____ e or b_____ c.</p> <p>70. Water has a pH of _____.</p> <p>71. When silver nitrate reacts with sodium chloride, a white insoluble solid called silver chloride is formed. What word is used to describe this insoluble solid? p_____.</p> <p>72. What name is given to this kind of chemical change? p_____.</p> <p>73. Write a word equation to represent this chemical equation. _____</p> <p>74. Universal indicator will turn r_____ in the presence of an acid.</p>
<p>5.8 Relates the structure and function of living things to models, theories and laws. Students will learn about:</p> <p>5.8.1 cell theory to:</p> <p>a) explain that systems in multicellular organisms serve the needs of cells.</p> <p>b) identify the role of cell division in growth, repair and reproduction in multicellular organisms.</p> <p>c) identify that abnormal cell function may result in disease.</p> <p>5.8.2 the Watson-Crick model of DNA to:</p> <p>a) explain the advantages of DNA replicating exactly.</p> <p>b) explain the advantages and disadvantages of DNA mutating.</p> <p>c) identify that information is transferred as DNA on chromosomes when cells reproduce themselves.</p> <p>d) identify that genes are part of DNA.</p> <p>e) identify the role of genes and environmental factors in determining the features of an organism.</p>	<p>Cell</p> <p>Multicellular</p> <p>Nucleus</p> <p>Cytoplasm</p> <p>Chromosome</p> <p>Gene</p> <p>Watson</p> <p>Crick</p> <p>DNA</p> <p>Mitosis</p> <p>Replicate</p> <p>Meiosis</p> <p>Gametes</p> <p>Ovaries</p> <p>Ovum</p> <p>Sperm</p> <p>Fertilisation</p> <p>Conception</p> <p>Dominant</p> <p>Recessive</p> <p>Colour-blindness</p> <p>Male</p> <p>Female</p> <p>Genetic engineering</p> <p>Mendel</p>	<p>1. All living things are composed of c_____.</p> <p>2. A human is an example of a m_____ organism because it is made up of millions of cells.</p> <p>3. The control centre of a cell is its n_____.</p> <p>4. The thick fluid surrounding the control centre and filling the cell is called c_____.</p> <p>5. A cell is surrounded by a c_____ m_____ which controls movement of substances in and out of the cell.</p> <p>6. This control centre also contains strands of genetic material called c_____ which are necessary for inheritance.</p> <p>7. These strands are made of a special chemical called D_____.</p> <p>8. A molecule of DNA looks like a spiral ladder and is called a d_____ h_____. The two scientists who developed the model of DNA were W_____ and C_____.</p> <p>9. The DNA molecule is made up of small units called g_____ which are responsible for different characteristics.</p> <p>10. C_____ is an example of a non-infectious disease caused when the genetic code on the chromosomes is not correctly copied resulting in the formation of abnormal cells.</p> <p>11. The growth of a baby is brought about by a special cell division of body cells called m_____.</p> <p>12. When a cell divides, the DNA molecules copy themselves or r_____ in order to pass a set of instructions to each cell.'</p> <p>13. There are _____ chromosomes in a human body cell.</p> <p>14. How many chromosomes are in a human sex cell? _____</p> <p>15. Sex cells are made by a cell division process called m_____.</p> <p>16. The two kinds of cell division processes are m_____ and m_____.</p> <p>17. Sex cells are generally called g_____.</p> <p>18. A male gamete is called a s_____.</p> <p>19. A female gamete is called an o_____.</p> <p>20. What sex chromosome would a female have? _____</p> <p>21. What sex chromosome would a male have? _____</p> <p>22. If a skin cell of an animal has 38 chromosomes in the nucleus of the cell, how many chromosomes will be found in the sex cells of that animal? _____</p> <p>23. Genes exist in p_____. One of these may mask the effects of the other and is called a d_____ gene. A gene which is masked by the presence of another is called a r_____ gene.</p> <p>24. If a baby inherits a gene for blond hair and one for dark hair, what do you predict will be the colour of the child's hair? _____</p> <p>25. Which gene above is dominant? _____</p> <p>26. Which gene above is recessive? _____</p> <p>27. What gene combination would you expect the child to have if it is doing to have blond hair? _____</p> <p>28. During inheritance, half the genes come from the _____ and half come from the _____.</p>

<p>5.8.3 the theory of evolution and natural selection to:</p> <p>a) discuss <i>evidence</i> that present-day organisms have <i>evolved</i> from organisms in the <i>distant past</i>.</p> <p>b) relate <i>natural selection</i> to the theory of <i>evolution</i>.</p>	<p>Evolution Darwin Lamarck Mendel Natural selection Environment Variation Offspring Reproduce Fossil Radioactive dating</p>	<p>29. Occasionally the fertilised egg may have the wrong number of chromosomes. Name an inherited condition of an individual due to having more or less chromosomes than normal. _____</p> <p>30. Sometimes inheritance is sex-linked and is passed on to children, generally boys, through the mother. Name one sex linked disorder. C _____</p> <p>31. A p _____ chart shows family relationships and how characteristics are passed on from one generation to the next.</p> <p>32. In such a chart, a square represents a m _____ and a circle represents a f _____.</p> <p>33. When a characteristic is being tracked in a family tree chart, the individuals that exhibit the characteristic will be c _____ or shaded in.</p> <p>34. Members of a family in the s _____ generation will appear along the same branch of the family tree or pedigree chart.</p> <p>35. The biologist who first studied inheritance in pea plants was M _____.</p> <p>36. The technology that involves the deliberate manipulation of genes is known as g _____ e _____.</p> <p>37. A c _____ is an exact genetic copy made of an organism. Eg 'D _____' the sheep.</p> <p style="text-align: center;">***</p> <p>1. Charles D _____ first suggests that living things developed from simpler organisms over very long periods of time. This theory is known as e _____.</p> <p>2. The unaccepted theory that explained that changes in organisms were acquired during their lifetime and passed onto their offspring was proposed by L _____.</p> <p>3. Support for the theory of e _____ comes from the study of ancient life forms called f _____.</p> <p>4. Similarity of the _____ of vertebrates indicate that they may share a common ancestor.</p> <p>5. The process by which species change and form new species is explained by the theory of n _____ s _____ which is often called the 'survival of the fittest'.</p> <p>6. This theory above explains evolutionary changes occur because members of a single species show v _____. In the struggle to survive, some members of the species die before they r _____. The members that survived, possibly due to a characteristic that was an advantage to their survival, were able to pass on their beneficial characteristics to their o _____. Over time, these organisms became better suited to their e _____.</p> <p>7. The approximate age of fossils can be determined by r _____ dating of the rocks in which they are found.</p> <p style="text-align: center;">***</p>
<p>5.8.4 humans to:</p> <p>a) describe the role of, and interaction between, <i>coordination systems</i> in <i>maintaining humans</i> as <i>functioning organisms</i>.</p> <p>b) describe some <i>responses</i> of body systems to <i>infectious</i> and <i>non-infectious</i> diseases.</p> <p>c) relate the <i>organs</i> involved in <i>human reproductive systems</i> to their function.</p>	<p>Coordination System Tissue Organ Central nervous system Neuron Impulse Hormones Pituitary Pancreas Reflex Immunity Immune system Pathogen Infectious</p>	<p>1. C _____ describes how all the systems of the living body work together so that the body functions effectively.</p> <p>2. A t _____ is a group of cells that carry out a specialised function in the body.</p> <p>3. An o _____ consists of one or more tissues to carry out one or more functions in the body.</p> <p>4. A s _____ consists of two or more organs working together. Eg the c _____ n _____ s _____ consists of the brain and spinal cord.</p> <p>5. The endocrine system consists of glands like the ovaries and tests that produce special chemicals called h _____. These chemicals are carried in the blood to control certain functions of the body.</p> <p>6. Some examples of endocrine glands in the body are the o _____, t _____, p _____ and the p _____ gland which is the considered master gland instructing other glands to release their hormones.</p> <p>7. A r _____ action is a very rapid, unconscious and uncontrolled response by the body to a stimulus which could be harmful to the body,</p> <p>8. Another name for a nerve cells is n _____.</p> <p>9. A nerve message is called an i _____.</p> <p>10. Two examples of disease-causing microbes are b _____ and v _____.</p> <p>11. Antibiotics kill only the b _____ causing infections in the body, not v _____.</p> <p>12. One example of an antibiotic is p _____.</p> <p>13. A v _____ taken orally or by an injection may be used medically to prevent diseased from bacteria and viruses.</p> <p>14. Female sex cells are made in hormone producing organs (endocrine glands) called o _____.</p>

	Non-infectious Microbe Pathogen Bacteria Viruses White cells Mutation Antibodies Antibiotic Penicillin Bacteria Virus Vaccine Uterus Testes Ovary Zygote Uterus Embryo Foetus Gestation	15. Male sex cells are made in hormone producing organs called t _____. 16. The development of a baby occurs in the organ of the female called the u _____ or w _____. 17. The period of development of the baby from fertilisation to birth is called g _____. 18. A fertilised egg is called a z _____. 19. Conception is the union of a male sex cell with a female sex cell and is also called f _____. 20. The baby in the earliest stage of development is called an e _____. 21. When a baby reaches a stage of development in the uterus that makes it recognisable as human it becomes known as a f _____. 22. Infectious diseases, eg Chicken pox, are caused by microbes known as p _____. 23. N _____diseases cannot be spread from person to person. 24. W _____ cells in the blood defend the body by destroying invading pathogens. 25. The immune system produces special proteins called a _____ to fight invading pathogens. 26. Sometimes changes to genes and chromosomes may occur in living things. These changes are called m _____ and generally have no adverse effect if the changes are minor. These changes may be caused by exposure to radiations like r _____ or c _____. 27. The body provided i _____ to disease by producing substances to attack invading organisms.
<p>5.9 Relates the development of the universe and the dynamic structure of Earth to models, theories and laws and the influence of time. Students will learn about:</p> <p>5.9.1 the big bang theory to:</p> <p>a) discuss current <i>scientific thinking</i> about the <i>origin</i> of the universe.</p> <p>b) identify that some types of <i>electromagnetic radiation</i> are used to provide <i>information</i> about the universe.</p> <p>c) describe some of the difficulties in obtaining <i>information</i> about the universe.</p> <p>5.9.2 the theory of plate tectonics to:</p> <p>a) discuss <i>evidence</i> that suggests crustal plates move over time.</p>	Big bang Universe Light years Electromagnetic Expansion Galaxy Solar system Plant Star Nuclear fission Radio telescope Optical telescope Refractor Reflector Lenses Mirrors Plant Moon Black hole Red giant White dwarf Supernova Nebula Plate tectonics	1. The theory that suggests that the universe began with a violent explosion is called the B ___ B ____. 2. The universe began about 12 b _____ years ago. 3. The explosion that is thought to have begun the universe may be the reason for the e _____ of the universe that may continue forever or may eventually cause the universe to collapse on itself. 4. Astronomers use the speed of l _____ to measure distances in space. 5. Distances in space are measured in l ____ y ____. 6. Radio telescopes like Australia's P _____ R _____ collect r _____ w _____ from objects in space like s _____ and g _____. 7. The advantage of collecting r _____ signals from space is that this kind of e _____ radiation is not obstructed by clouds or dust like l _____ energy is. 8. Radio telescopes can operate all day event in c _____ weather whereas optical telescopes can only operate at n _____ and when there is no c _____. 9. Astronomers use i _____ waves or h _____ energy to study cooler places in the universe such as star forming regions, faint stars and p _____ and m _____ of our solar system 10. Other forms of electromagnetic radiation used in the study of the universe are X ____, g _____ and u _____. These radiations are collected in space by special detectors because they cannot penetrate Earth's at_____. 11. Optical telescopes make use of components called l _____ or m _____ to collect light energy from space. Consequently, these telescopes are known as refractors and r _____. 12. A g _____ consists of billions of stars. Ours is called the M _____ W _____. 13. Stars create their energy from the nuclear f _____ involving h _____ gas being changed to h _____ gas. 14. A star undergoes change overtime called a l ____ c ____. 15. A n _____ is a cloud of dust or gas. Many are places where s _____ are being created. 16. Some large stars end their existance with a huge explosion called a s _____ resulting in a b ____ h ____. 17. Our sun will exist for about another 5 b _____ years. As it uses up its fuel, the Sun will become a large star called a r ____ g ____ near the end of its existence and eventually change to a w ____ d _____. 18. The crust of the Earth is made up of sections called p _____ which slowly move in different directions over time causing m _____.

5.9.3 components of the universe to:

- a) relate some *major features* of the universe to *theories* about the *formation of the universe*.
- b) describe some *changes* that are likely to take place during the life of a star.

5.9.4 natural events to:

- a) identify that *geological history* can be interpreted from the *formation*, by sediments, of *horizontal layers* in which the oldest are at the *base* and the *youngest* at the top.
- b) describe *conditions* under which fossils form.
- c) relate the fossil record to the age of Earth and the time over which life has been *evolving*.
- d) relate *movements* of Earth's plates to *convection currents* in the *mantle* and to *gravitational forces*.
- e) explain how interactions at plate boundaries may result in *earthquakes, volcanic activity* and new landforms.
- f) explain some impacts of *natural events* including *cyclones, volcanic eruptions* and *earthquakes* on the *atmosphere, hydrosphere, lithosphere* and/or *biosphere*.

- Continental drift
- Crust
- Mantle
- Asthenosphere
- Lithosphere
- Hydrosphere
- Biosphere
- Magma
- Lava
- Sedimentation
- Earthquake
- Volcano
- Eruption
- Ring of fire
- Convection current
- Pangaea
- Gondwana
- Subduction
- Ringe
- Fault
- Primary waves
- Secondary waves
- Surface waves
- Cyclone
- Tornado
- Tsunami

- e_____ and v_____ to form. The theory that explains this phenomenon is called p_____ t_____ or is often called the theory of c_____ d_____.
19. The Ring of Fire describes the region encircling the Pacific Ocean where many v_____ are located.
 20. The movements of the sections of crust is caused by c_____ c_____ in a special part of the hot mantle inside the Earth called the a_____.
 21. The single, giant landmass or supercontinent that originally existed 250 million years ago is called P_____.
 22. Australia is part of the landmass known as G_____ which separated from the original landmass about 200 million years ago.
 23. The process of s_____ involves oceanic crust sliding below continental crust.
 24. The San Andreas F_____ is where two places are sliding past each other whereas an ocean ridge at the bottom of the A_____ Ocean has been formed by two plates pulling apart.
 25. Earthquakes consist of three kinds of waves of which the s_____ waves cause the most damage.
 26. The H_____ Mountains have been formed by two plates crashing into each.
 27. The sedimentary rocks of the crust are formed in h_____ layers under w_____.
 28. A f_____ is the remains of ancient life commonly formed by rapid burial in water.
 29. A rock near the top of a sequence of rocks is y_____ than the rock at the bottom which is considered the o_____.
 30. The sedimentary rock called _____ has been formed millions of years ago from the skeletons of a_____ that lived in a warm tropical _____.
 31. Lava from volcanoes cools to form a black rock called b_____.
 32. The layer of gases surrounding the Earth is called the a_____.
 33. The crust of the Earth is also called the l_____.
 34. The biosphere is where all l_____ is found.
 35. Oceans, rivers, lakes etc make up the h_____ of the Earth.
 36. Three examples of natural disasters associated with plate movements are volcanic e_____, t_____ and e_____.
 37. A volcano erupts when m_____ moves upwards through the Earth's crust. Magma then becomes known as l_____.
 38. Examples of natural disasters that originate in the atmosphere are c_____, and t_____.

5.10 Assesses human impacts on the interaction of biotic and abiotic features of the environment. Students will learn about:

5.10 ecosystems to:

- a) distinguish between *biotic* and *abiotic* features of the local *environment*.
- b) describe the importance of *cycles of materials* in

- Biotic
- Abiotic
- Cycle
- Ecosystem
- Ecology
- Biodiversity
- Conservation
- Farming
- Mining
- Introduced species

1. The biotic features of an ecosystem include all the l_____ o_____.
2. The a_____ features of an ecosystem include the non-living things such as t_____, w_____, l_____ and o_____.
3. E_____ is the study of the interaction of organisms with each other and the environment.
4. In an e_____, organisms interact with each other in a balanced way.
5. C_____ is the management of resources to protect Earth's natural resources.
6. Water can exist in all three states, ie s_____, l_____ and g_____.
7. The water on Earth moves through a cycle from the e_____ of oceans and other water bodies, to the a_____ and back to the land and used for living things via the r_____.
8. The great variety of living things is called b_____.
9. Humans are affecting the biodiversity by causing loss of habitat through activities such as f_____, m_____, building c_____, using p_____ for control of pests in agriculture and by adding introduced s_____ eg the rabbit, which may compete with native species for food.

<p><i>ecosystems</i>.</p> <p>c) describe some <i>impacts</i> of human <i>activities</i> on <i>ecosystems</i>.</p> <p>d) discuss <i>strategies</i> used to <i>balance</i> human activities and needs in ecosystems with <i>conserving, protecting</i> and <i>maintaining</i> the <i>quality</i> of the environment.</p>	Pesticides Respiration Decomposition Bacteria Fungi Photosynthesis Temperature Oxygen Water Rain Light Erosion Evaporation	<p>10. The element c_____, which is present in all living things, is cycled through nature particularly via the processes of r_____, p_____, and d_____ of dead organisms.</p> <p>11. The process of making food in plants from water and carbon dioxide in the presence of sunlight and chlorophyll (the green pigment in plants) is called p_____.</p> <p>12. R_____ is the chemical process that occurs in all cells of living things involving the breakdown of food (glucose) in the presence of o_____ to produce energy.</p> <p>13. D_____ involves the breakdown of dead organisms by bacteria and f_____.</p>
<p>5.11 Analyses the impact of human resource use on the biosphere to evaluate methods of conserving, protecting and maintaining Earth's resources. Students learn about:</p> <p>5.11.1 energy resources to:</p> <p>a) discuss the importance of energy as a <i>resource</i> and identify <i>renewable</i> and <i>non-renewable</i> sources of energy.</p> <p>b) identify <i>properties</i> that make some natural resources economically <i>important</i> and describe their uses.</p> <p>5.11.2 waste from resource use to:</p> <p>a) relate pollution to <i>contamination</i> by <i>unwanted</i> substances.</p> <p>b) identify excessive use of fossil fuels as a contributing factor to a <i>greenhouse effect</i>.</p>	Renewable Non-renewable Nuclear Tidal energy Pollution Fossil fuel Greenhouse effect Acid rain Coal Petroleum Natural gas Photovoltaic cells Solar energy Geothermal Methane Biomass Ore Law of conservation of energy	<p>1. All energy on Earth originally comes from the S____. This is commonly called s_____ energy.</p> <p>2. F_____ f_____ are examples of non-renewable resources because they cannot be replaced when used up.</p> <p>3. Examples of the fuels above are c_____ which has been formed from p_____ in swampy conditions, p_____ and n_____ g_____.</p> <p>4. One disadvantage of burning the fuels above is that c_____ d_____ is produced which contributes to global warming known as the g_____ e_____.</p> <p>5. Another problem for the environment from the burning of fossil fuels is a_____ r_____ which is the result of sulphur gas emissions that eventually dissolve in water in the atmosphere.</p> <p>6. Two examples of renewable sources of energy are w_____ and t_____ energy.</p> <p>7. Ores containing m_____ are examples of non-renewable resources.</p> <p>8. Some countries use the energy from hot rocks. This is called g_____ energy.</p> <p>9. The energy stored in fuels is called c_____ potential energy.</p> <p>10. When fuels are burned their energy is converted to h_____.</p> <p>11. Energy can never be c_____ or d_____. It becomes changed into other forms of energy. This is called the law of c_____ of e_____.</p> <p>12. Special devices called p_____ cells can change solar energy into e_____ energy.</p> <p>13. Decaying plants and animals, or any matter obtained from biological sources commonly called b_____, produce m_____ gas as a waste product that can be used as a renewable fuel.</p> <p>14. Hydroelectric power stations use the energy of falling w_____ to drive turbines which generate e_____.</p> <p>15. N_____ power stations use radioactive fuels such as p_____ and u_____ to heat water which changes to s_____. This drives the turbines to make e_____.</p> <p>16. The environment is said to be p_____ when it is contaminated with unwanted substances.</p> <p>17. Recycling of substances is considered to be a method of reducing pollution and the use of some non-renewable materials. Some of the materials commonly recycled are p_____, g_____, p_____, and the metals a_____ and i_____.</p>
<p>5.12 Relates the interactions involved in using some common technologies to their underlying scientific principles. Students will learn about:</p> <p>5.12 technology to:</p> <p>a) identify that <i>simple machines</i> make tasks <i>easier</i> and more</p>	Lever Gears Pulley Inclined plane Ramp Work Fulcrum Friction Television	<p>1. Work can be done more easily with the help of simple machines like l_____, p_____, g_____ and i_____ p_____.</p> <p>2. The turning point of a lever is called the f_____.</p> <p>3. Another name for inclined plane is a r_____.</p> <p>4. Two other applications of inclined planes are the s_____ and w_____.</p> <p>5. A p_____ is a grooved wheel and axle around which a rope or cable can be used to change the direction of a force called the e_____ needed to move a load.</p> <p>6. When a simple machine has two or more pulleys, it becomes known as a b_____ and t_____.</p> <p>7. Wheels and axles that have teeth are called g_____.</p> <p>8. Simple machines enable w_____ to be done more conveniently.</p>

- convenient.**
- b) identify some **advantages** of **levers, pulleys, gears** and **inclined planes**.
 - c) describe some everyday uses and effects of **electromagnetic radiation** including applications in **communication technology**.
 - d) discuss, using examples, how **developments** in electronics have changed **technology** and identify some **applications**.
 - e) give examples of **medical** and **industrial** uses of **nuclear energy** and discuss the **benefits** and **problems** associated with these uses.
 - f) describe some **benefits** and **problems** and some of the **social** and **ethical** issues of using **biotechnology**.
 - g) describe ways in which technology has **increased** the variety of **materials**.

Radio
Light
Geostationary Satellite
Microwaves
Computer
Plastic
Polymer
Genetic engineering
DNA
Genetically modified foods

- 9. Machines are never 100% efficient due to the loss of energy through **f**_____.
- 10. Energy of movement is called **k**_____ energy.
- 11. Communication in today's society takes advantage of electromagnetic waves such as **r**_____ and **t**_____ waves, **m**_____ and laser **l**_____ in optic fibres.
- 12. In Australia, **s**_____ in space are used to transmit radio, television and telephone signals to all parts of the country and the world.
- 13. Mobile phone technology relies on the transmission of **r**_____ waves.
- 14. The telephone used in the home converts the **s**_____ of your voice to pulses of electricity.
- 15. One very useful development in electronics is the **c**_____ which can store and process data to make decisions.
- 16. The electromagnetic radiation called **m**_____ are very useful in today's society. They are used in the home to cook food and also **g**_____ satellites in communication.
- 17. Technology has enabled the development of many useful materials such as **p**_____ commonly called **p**_____.
- 18. **G**_____ **g**_____ is an example of biotechnology. It involves the altering of the **D**_____ of life in the laboratory. This process has presented **e**_____ issues in society eg. the production of **g**_____ **m**_____ foods.
- 19. Describe one use of any radioisotope in medicine:

- 20. One technological use of a radioactive substance in industry is:
