KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

CURRICULUM GRADE 10-12 DIRECTORATE

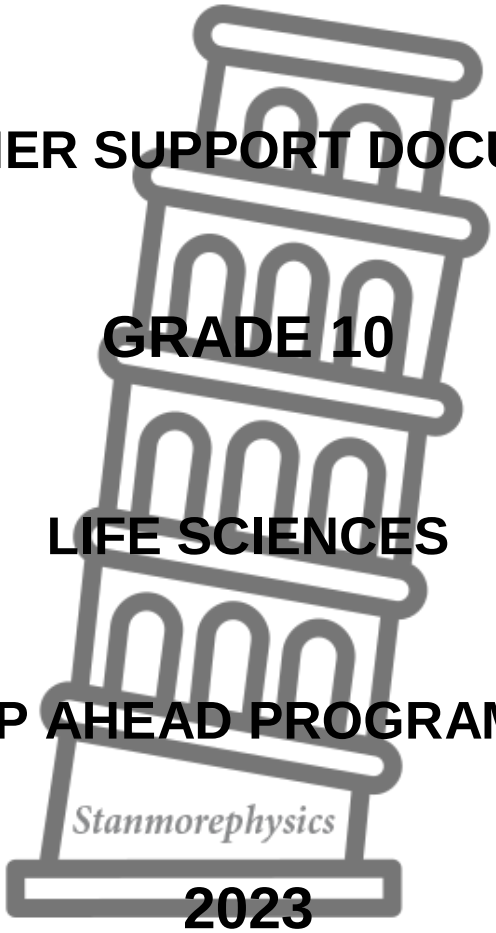
NCS (CAPS)

TEACHER SUPPORT DOCUMENT

GRADE 10

LIFE SCIENCES

STEP AHEAD PROGRAMME



2023

Topic: Plant tissues, Organs, Support and Transport in plants

Activity 1

No.	Description	Biological Term
1.1	A group of similar cells adapted for a particular function	**Tissue**
1.2	A permanent tissue that lines the surfaces of roots, stem and leaves	**Epidermis**
1.3	Movement of particles from a high to a low concentration	**Diffusion**
1.4	A tissue that is actively dividing by mitosis to form new cells in plants.	**Meristematic**
1.5	Tissue in plants that conducts water and mineral salts	**Xylem**
1.6	Elongated, living cells that transport the dissolved food in phloem tissue	**Sieve tubes**
1.7	Movement of water from a high WP to a low WP across a differentially permeable membrane until dynamic equilibrium is reached	**Osmosis**
1.8	The force that moves water into the leaf cells from the xylem vessels to replace the water lost due to transpiration	**Transpiration pull**
1.9	The pressure that forces water to move through the roots and up the stem of a plant	**Root pressure**
1.10	Apparatus used to measure the rate of transpiration	**Potometer**
1.11	A pore in the epidermis of the leaf between two guard cells	**Stoma**
1.12	Loss of water vapour through the stomata	**Transpiration**
1.13	Cells formed from epidermal cells in the root to absorb water	**Root hairs**
1.14	Modified epidermal cells that surround the stoma	**Guard cells**
		1x14
		(14)

Activity 2

2			
	2.1	(a) B✓ – xylem ✓	(2)
		(b) C✓ - Sclerenchyma✓	(2)
	2.2	- Cells are elongated and non living ✓/ joined and forming continuous tubes✓ - Contains thickened / lignified walls to withstand pressure of water✓ - Perforated with pits for lateral water transport ✓	(4)
			(8)

Activity 3

3			
	3.1	(a) B✓ - Xylem✓	(2)
		(b) C ✓- Phloem✓	(2)
		(c) A ✓- Parenchyma✓	(2)
	3.2	- To strengthen the wall so that they do not collapse ✓✓	(2)
			(8)

Activity 4

4			
	4.1	(a) Parenchyma ✓	(1)
		(b) collenchyma✓	(1)
	4.2	- No movement of food from one cell to another✓ - No movement of food from the leaves to other parts of the plant✓	(2)
	4.3.	- Has thin cell wall✓ allowing movement of water and mineral salts✓ - Has a large vacuole to store water✓ - Has large intercellular air spaces to allow gaseous exchange✓	(4)
	4.4	- Has thick cell wall✓ -For strength and support✓	(2)
			(10)

Activity 5

5			
	5.1	(a) root hair✓	(1)
		(b) epidermis✓	(1)
	5.2.	(a) E✓- Pericycle✓	(2)
		(b) F✓- Phloem✓	(2)
		(c) G✓- Parenchyma✓	(2)
		(d) D✓- Xylem✓	(2)
			(10)

Activity 6

6			
	6.1	(a) A✓	(1)
		(b) E✓	(1)
	6.2	Mesophyll✓	(1)
	6.3.	✓ **Table** **Epidermal cell** | **Guard cell of stomata** No chloroplast ✓ | Has chloroplast✓ Brick- shaped cells✓ | Bean-shaped cells✓ **MARK ANY ONE**	(3)
	6.4.	- contains many chloroplasts for absorption of sunlight✓ / photosynthesis - cells are thin walled and this facilitate gaseous exchange✓	(4)
			(10)

Activity 7

7			
	7.1	root✓	(1)
	7.2	(a) 2- parenchyma cortex✓	(1)
		(b) 5 - Tonoplast✓	(1)
		(c) 8 – Cell wall✓	(1)
	7.3	(a) 3 – direct water into the xylem of the stem✓	(1)
		(b) 4 – transport water and minerals from the roots to the stem and to the leaves✓/ it also give strength to the plant✓	(1)
	7.4	- cross walls are perforated or completely absent ✓ - xylem of the roots forms continuous tubes with xylem of stem and leaves✓ - xylem vessels have no living contents✓ allowing water to flow freely inside✓ - walls of vessels tracheids not completely thickened✓ that allow pits water to move across the roots and stem✓	(4)
			(10)

Activity 8

8			
	8.1	Osmosis✓	(1)
	8.2	- Water molecules move from tap water into the egg cell✓ - As a result of a concentration gradient / since tap water has higher concentration of water✓	(2)
	8.3	- To expose cell membrane / remove the impermeable shell✓ -So that water can pass through✓	(2)
	8.4	- Size of the beaker✓ - Amount of sugar solution and tap water✓ - Size of egg✓ - Same method to remove shell✓	(2)
			(7)

Activity 9

9			
	9.1	(a) rate of transpiration✓ in leaves	(1)
		(b) Different light intensities✓	(1)
	9.2	It increased the rate of transpiration✓	(1)
	9.3	- Repeat the investigation✓ - increase sample size✓ - calculate average✓ **(any 2)**	(2)
	9.4	- Humidity✓ - Temperature✓ - Wind✓	
	9.5	Serve as a control✓ to compare results✓	(2)
	9.6	- The rate of transpiration increases with an increase with the light intensity up to a point where it no longer increases✓✓	(2)
			(9)

Activity 10

10			
	10.1	Potometer✓	(1)
	10.2	(a) Temperature ✓	(1)
		(b) Rate of transpiration ✓	(1)
	10.3	- To prevent air from entering ✓ - Blocking the xylem ✓	(2)
	10.4	- To measure the rate of absorption ✓ - Which indicates the rate of transpiration✓	(2)
	10.5	- To move the air bubble back✓	(1)
	10.6	- Investigation was done THREE times✓ /repeated the investigation✓	(1)
	10.7	- Same apparatus/ photometer✓ - Same light intensity✓ - Same person to conduct investigation✓	(2)
			(11)

Topic: Animal Tissues

Activity 1

No.	Description	Biological Term
1.1	Type of epithelium lining the nostrils, trachea and bronchi which has hair-like outgrowths	**Ciliated✓**
1.2	Structural unit of the nervous system	**Neuron✓**
1.3	Tissue that joins muscle to bone	**Tendons✓**
1.4	Tough fibrous connection between muscles and bones	**Ligaments✓**
1.5	Specialised cell in ciliated columnar epithelial tissue which produce mucus	**Goblet✓**
1.6	The only liquid connective tissue in the body	**Blood✓**
1.7	Tough elastic connective tissue found between vertebrae	**Cartilage✓**
1.8	Nerve fibres that conduct nerve impulses to the cell body	**Sensory✓**
1.9	Type of epithelium making up multicellular glands in the body.	**Cuboidal✓**
1.10	Type of muscle that are attached to the bones of the skeleton.	**Striated✓**
		(10)

Activity 2

2			
	2.1		
		(a) Columnar✓ (b) Ciliated Columnar epitheliums ✓	(1) (1)
	2.2	Lines the nose✓ and windpipe✓	(2)
	2.3	✓ **A**: No cilia✓ | **B**: Have cilia✓	(3)
	2.4	- Produces mucus to trap dust✓ - Has cilia to move dust away the body✓	(2)
			(9)

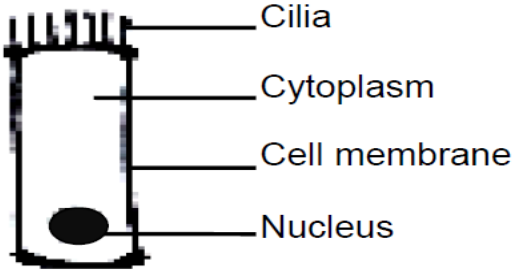
Activity 3

3			
	3.1	A Cardiac muscle✓ B Bone muscle✓	(2)
	3.2	Heart✓	(1)
	3.3	Gives Strength and Support✓	(1)
	3.4	Heart beat will be slower✓ Leading to low blood pressure✓ Less glucose and oxygen sent to the cells✓ Reduces cellular respiration✓ Therefore less energy produced✓ any	(4)
			(8)

Activity 4

4			
	4.1	C-Responsible for voluntary actions✓ E-Responsible for involuntary actions✓	(2)
	4.2	The body will not sense the stimulus✓ from the environment and chemical changes within the body✓	(2)
	4.3	(a) A ✓Areolar ✓	(2)
		(b) B✓ Cartilage✓	(2)
		(c) C✓ Bone tissue✓	(2)
			(10)

Activity 5

5			
	5.1	(a) Ciliated epithelium/ squamous ciliated epithelial tissue ✓	(1)
	5.2	- It has mucus✓ to trap dust✓ - It has cilia✓ which moves to drive out mucus with dust✓	(4)
	5.3	Trachea✓/bronchi/bronchiole	(1)
	5.4	 **Ciliated Epithelial cell**	(4)
			(10)

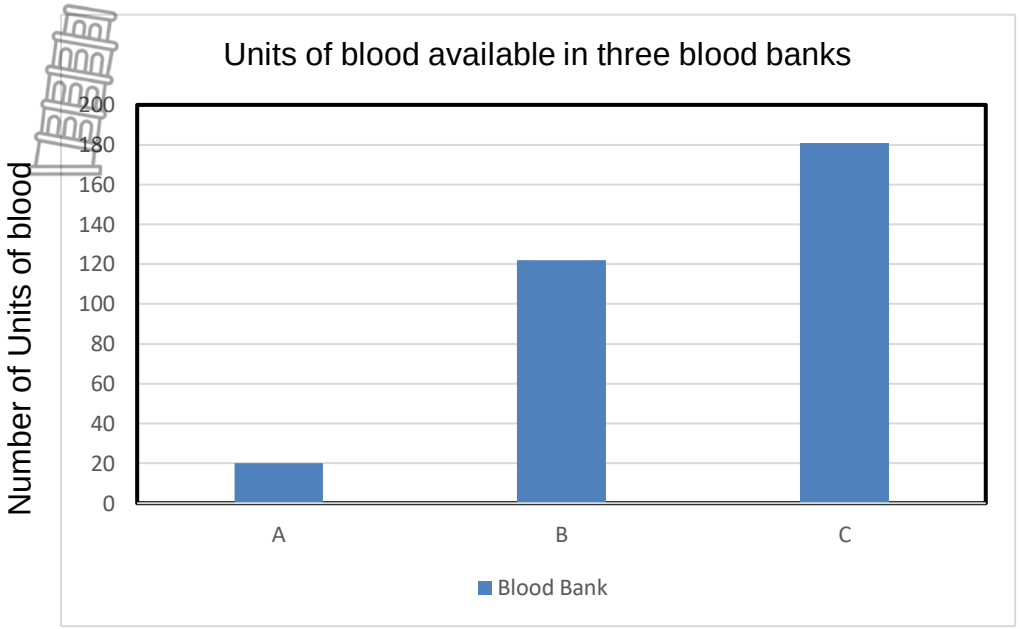
Rubric for the mark allocation of the diagram

CRITERIA	Mark allocation
Labels	Any (3)
Caption	(1)
	(4)

Activity 6

6			
	6.1	A✓	(1)
	6.2	- Tendons stretch less✓ - thus allowing the bone to move✓	(2)
	6.3	Join bone to bone✓ at joints	(1)
	6.4	- Ligaments have yellow elastic fibres✓ - Able to stretch✓/allow bones to move at joints	(2)
	6.5	To increase reliability✓	(1)
	6.6	-People of the same age✓ -People of the same gender✓ -Use same instrument for measuring✓	(2)
	6.7	In order to increase validity✓	(1)
	6.8	0.08 mm – 0.06mm✓ = 0.2✓ mm✓	(3)
			(13)

Activity 7

7			
	7.1	510-181✓ =329✓	(2)
	7.2		

Rubric for the mark allocation of the bar graph

Correct type of graph	1
Caption	1
Correct labels for X-axis and Y-axis	1
Correct scale for X-axis and Y-axis	1
Plotting of bars	1:1 to 2 bar plotted correctly 2: All 3 bars plotted correctly

(6)

(8)

Activity 8

8			
	8.1	(a) **Structural** -ligaments have yellow elastic fibres✓ -tendons have white inelastic fibres✓	(2)
		(b) **Functional** -ligaments join bone to bone at joints✓ -tendons attach muscles to bones✓	(2)
		(c) connective tissue✓	(1)
	8.2	To transmit the contraction and relaxation of muscles to bones✓ so that movement takes place✓	(2)
	8.3	Unable to stretch✓ and not allowing bones to move at joints✓	(2)
	8.4	Ligaments✓ can be damaged /stretched or torn✓	(2)
	8.5	-Regular exercises✓ -Body warm ups before vigorous exercise✓	(2)
			(13)

Topic: Support in Animals

Activity 1

No.	Description	Biological Term
1.1	Part of the human skull that encloses and protects the brain.	**Cranium✓**
1.2	Longest bone of the pectoral girdle.	**Humerus✓**
1.3	Long bone of the upper leg.	**Femur✓**
1.4	Bone in line with the thumb in the lower arm.	**Radius✓**
1.5	Opening at the base of the skull through which the spinal cord enters	**Foramen magnum✓**
1.6	A fluid between two bones	**Synovial fluid✓**
1.7	A structure that attaches bone to bone.	**Joint✓**
1.8	A tough band of inelastic fibrous tissue that attaches a muscle to a bone.	**Tendon✓**
		(8)

Activity 2

2			
	2.1	(a) radius✓	(1)
		(b) ulna✓	(1)
	2.2	A ✓and B✓	(2)
	2.3	(a) ball and socket✓	(1)
		(b) Hinge joint✓	(1)
	2.4	(a) Biceps✓ and triceps✓	(2)
		(b) They function antagonistically✓	(1)
			(9)

Activity 3

3			
	3.1	Axial Skeleton✓	(2)
	3.2	Foramen magnum✓	(1)
	3.3	Atlas ✓	(2)
			(5)

Activity 4

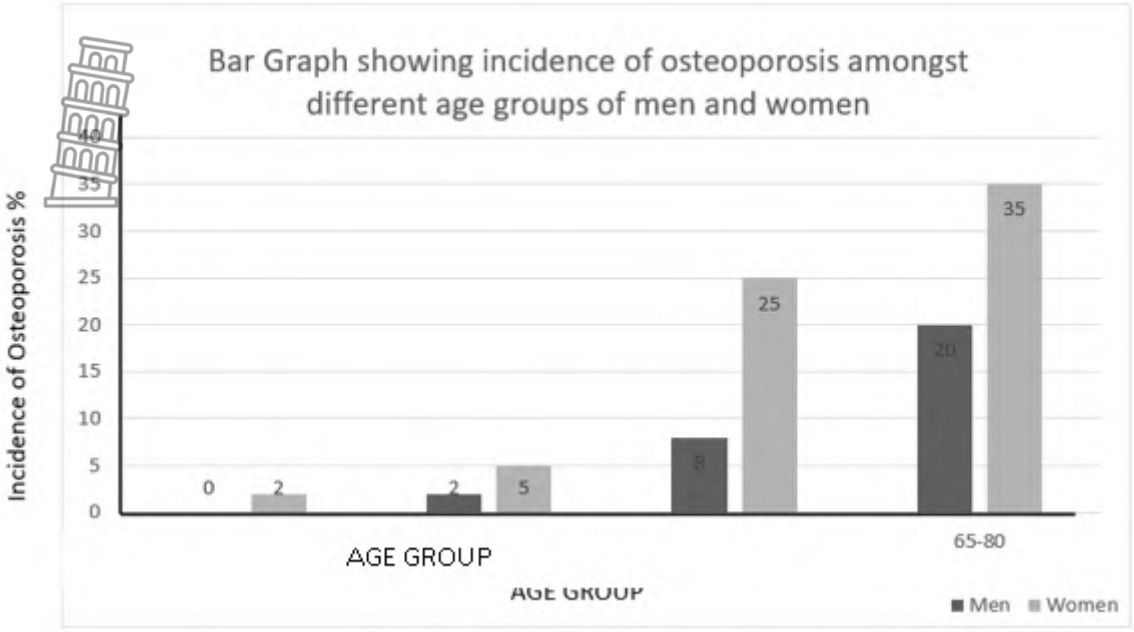
4			
	4.1	(a) Tibia✓	(1)
		(b) Fibula✓	(1)
	4.2	Ball and socket✓	(1)
			(3)

Activity 5

5			
	5.1	As age increases from 60 to 80✓, bone density decreases. ✓	(2)
	5.2	Brain✓	(1)
	5.3	Support✓ Movement✓ Hearing✓ Storage of minerals✓ **Any THREE**	(3)
			(6)

Activity 6

6			
	6.1	(a) Frequency of Osteoporosis✓	(1)
		(b) 20-35 ✓	(1)
	6.2	Decide on the number of participants✓ Decide on the measuring tool✓ Seek permission from stakeholders✓ Decide on the venue✓ **Any THREE**	(3)

	6.3	Women✓	(1)
	6.4		(6)
	6.5	Frequency of osteoporosis increases with age✓✓	(2)
			(14)

Correct type of graph	1
Caption	1
Correct labels for X-axis and Y-axis	1
Correct scale for X-axis and Y-axis	1
Plotting of bars	1:1 to 2 bar plotted correctly 2: All 3 bars plotted correctly

(6)

Topic: Transport system in animals

Activity 1

No.	Description	Biological Term
1.1	Blood vessel that carries oxygenated blood to the left atrium of the heart	**Pulmonary vein**✓
1.2	The largest artery in the body which leaves the left ventricle	**Aorta**✓
1.3	The chamber of the heart which has the pacemaker in its wall	**Right atrium**✓
1.4	A type of an involuntary muscle found only in the heart	**Cardiac muscle**✓
1.5	Vessels that return components of tissue fluid back to the blood system	**Lymph vessel**✓
1.6	The chamber in the heart that receives oxygenated blood from the left atrium	**Left ventricle**✓
1.7	The tissue which lines all blood vessels	**Endothelium**✓
1.8	Blood vessels that allows entry and exit of substances through its walls	**Capillaries** ✓
1.9	Valve in the heart that controls movement between the right atrium and right ventricle	**Tricuspid**✓
1.10	The upper chambers of the heart	**Atria**✓
		(10x1) **(10)**

Activity 2

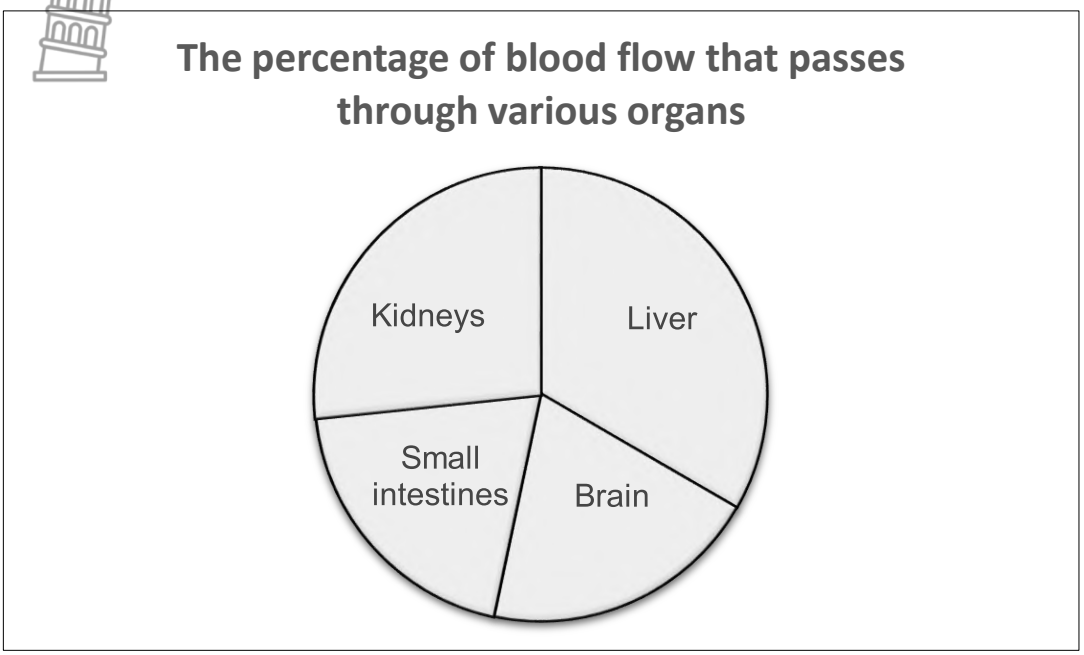
2			
	2.1	1 – Aorta ✓ 4 – Septum✓ 6 – Tricuspid valve ✓	(3)
	2.2	Lungs ✓	(1)
	2.3	Ventricular systole ✓	(1)
	2.4	Low oxygen level ✓	(1)
			(6)

Activity 3

	3.1	(a) Pulmonary artery✓	(1)
		(b) Left atrium✓	(1)
	3.2	Transports deoxygenated blood from the lower body part to the heart✓ (**Mark the first ONE only**)	(1)
	3.3	- Valves A and F close✓ - For the blood to flow up into the pulmonary artery and the aorta ✓	(2)

<table>
<tr><td></td><td>3.4</td><td>- Oxygenated blood will not exit the left ventricle ✓
- and no transport of oxygenated of blood the body parts ✓
- This will affect processes relying on oxygen✓ /respiration
- Leading to death ✓
(Any 3)</td><td>(3)</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>3.5</td><td>T *✓<table><tr><th>Artery</th><th>Vein</th></tr><tr><td>Pulmonary artery carry deoxygenated blood away from the heart✓</td><td>Pulmonary vein carry oxygenated blood to the heart✓</td></tr><tr><td>Most artery carry oxygenated blood✓</td><td>Most veins carry deoxygenated blood✓</td></tr></table>Table: (1) and (2 x 2)</td><td>(5)</td></tr>
<tr><td></td><td></td><td></td><td>(13)</td></tr>
</table>

Activity 4

4			
	4.1	100 -75✓ = 25%✓	(2)
	4.2	 **(25+15+15+20) = 75** Liver 25/75 x360 = 120^{O} Brain 15/75 x 360 = 72^{O} Small intestine 15/75 x 360 = 72^{O} Kidney 20/75 x 360 = 96^{O}	(6)
			(8)

Features	**Mark allocation**
Caption **(C)**	1
Correct type of graph **(T)**	1
Calculations: 1-3 correct calculations	1
All 4 correct calculations	2
Correct proportion **(P):** 1-3 correct proportion of slices	1
All 4 correct proportion of slices	2

Activity 5

5			
	5.1	- Sugar✓ - Bread ✓ - Pasta ✓ - Soda drinks ✓ - Candy ✓ **(Mark first TWO only) (Any 2 x 1)**	(2)
	5.2	Trans fats ✓	(1)
	5.3	- Most people believe you must stay away from saturated fats ✓ - But Dr Sinatra promotes saturated fats ✓ / He says we should rather stay away from sugar	(2)
	5.4	- The build-up of fatty deposits/ cholesterol on the artery wall causes them to become narrow ✓ - This is called atherosclerosis ✓ - This causes blood clots which block the arteries✓ - The blood cannot flow through ✓ - Heart muscle served by the artery dies from lack of oxygen ✓ causing a heart attack. **(Any 3 x 1)**	(3)
			(8)

Activity 6

6			
	6.1	(a) Vein ✓	(1)
		(b) Capillary✓	(1)
	6.2	- To withstand the high pressure ✓ - created by the pumping of the heart✓	(2)
	6.3	- Single layer of cells ✓ - to allow oxygen and nutrients to diffuse into the tissues✓ /CO_2 and excretory waste to diffuse from the tissues	(2)
			(6)

Activity 7

	7.1	A – General diastole✓ B – Atrial systole ✓ C – Ventricular systole✓	(3)
	7.2	- The two atria contract ✓ at the same time - The tricuspid ✓ and bicuspid valves open✓ - Blood flows into the two ventricles✓	(4)
	7.3	Sino-atrial node ✓ / SA node	(1)
			(8)

Activity 8

	8.1	**Cardiac cycle that moves blood containing oxygen:** - **Atrial systole** *✓/ both atria contract at the same time - The tricuspid and bicuspid valves open✓ - Blood flows from the atria into the ventricles✓ - **Ventricular systole*** ✓/ both ventricles contract at the same time - Both semi-lunar valves open✓ - Blood is forced from the right ventricle into the pulmonary artery✓ - and from the left ventricle into the aorta✓ - **General diastole***✓ /heart relaxes. - Tricuspid and bicuspid valves open ✓ - Blood enters the fight atrium from the inferior and superior vena carva✓ - and blood enters the left atrium from the pulmonary vein✓ ***3 compulsory marks** and **any 5**	**(8)**

Activity 9

9			
	9.1	**Pathway of the Red Blood Cell** - This is called the pulmonary circuit / circulation *✓ - When right atrium contracts ✓ - deoxygenated blood ✓is pumped - through the tricuspid valve ✓ - into the right ventricle. ✓ - When the right ventricle contracts ✓ - the blood is forced through the semi-lunar valves✓ - into the pulmonary artery. ✓ - The pulmonary artery branches to the right and left lung. ✓ - The arteries branch into smaller arterioles. ✓ - transporting the blood to the lungs. ✓ - In the lung the blood vessels branch to form the capillaries of the lung ✓ - The capillaries reform to form venules which form larger veins ✓ - The oxygenated blood travels along the pulmonary veins ✓ from each lung - The blood from the right and left lung enters the left atrium ✓ ***1 Compulsory mark** and **any 7**	**(8)**

Topic: History of life on earth

Activity 1

No.	Description	Biological Term
1.1	Process by which all members of a particular species die out so that not even a single one exist	Extinction
1.2	Study of life form that existed in previous geological period as represented by their fossil	Palaeontology
1.3	Upwards movements of plates	Plate tectonic
1.4	The process by which populations change over time due to the changes in their environment	Evolution
1.5	Evidence of ancient life	Fossil
1.6	Long period where earth experienced extremely cold weather	Ice age
		(6x1)=6

Activity 2

2			
	2.1	The sudden death of a large number of species✓ in short time.	(1)
	2.2	(Accept answer from) 55 – 60✓ million years ago✓/mya	(2)
	2.3	Permian✓ extinction	(1)
	2.4	400 – 200✓ = 200✓ families	(3)
		OR	
		400✓ – (210 to 230) ✓ = (190 to 170) ✓ families	
	2.5	Many genera were wiped out completely✓ during the extinction	
		so, their niches were left open✓/less predators.	
		These niches were rapidly taken over by other genera✓ /species,	
		who diversified and formed new genera/s✓species by natural selection	(5)
			(12)

Activity 3

3			
	3.1	(a) Trilobite✓	(1)
		(b) Ammonite ✓	(1)
	3.2	The organism dies and covered rapidly✓	
		by sediment✓ / silt	
		As time passes layers of sediment build up over the body ✓	
		The layers compress ✓ / are squashed	
		by immense pressure building up ✓	
		Minerals begin to replace animal tissues ✓	
		and the body petrifies✓ **(Any (4)**	(4)
	3.3	Frozen in ice ✓	
		Trapped in tar✓	
		Trapped in amber✓ **(Any 2)**	(2)
	3.4	Radiometric dating✓	(1)
			(9)

Activity 4

4			
	4.1	(a) Ordovician ✓	(1)
		(a) Trilobites✓	(1)
	4.2	Geological time scale ✓	(1)
	4.3	Cambrian ✓	(1)
	4.4	Relative dating ✓	(1)
	4.5	Index fossil✓	(1)
	4.6	Palaeontologist✓	(1)
			(7)

Activity 5

5			
	5.1	Mass extinctions✓	(1)
	5.2	Event 3✓	(1)
	5.3	A volcanic eruption released particles into the air ✓	
		which blocked out the sun✓	
		For long periods of time✓	
		Lowering temperatures on Earth ✓	
		causing many organisms to go extinct as they could not adapt✓	(3)
		(Any 3)	
	5.4	Asteroid impact✓	(1)
		Continental drift✓	(1)
			(7)

Activity 6

6			
	6.1	Palaeomastodon ✓	(1)
	6.2	83 mya/ Eocene✓	(1)
	6.3	Shorter trunk✓, smaller in size✓ ,small tusks✓	(3)
	6.4	Loxodonta Africana✓	(1)
	6.5	African elephant✓	(1)
	6.6	10 000 years ago✓	(1)
	6.7	Yes.(✓) lack of suitable habitats. ✓	(1)
		Threatened by poaching for ivory tusks OR	(1)
		No.(✓)many conservation parks established. Elephants monitored and protected from poachers✓	
			(10)

Activity 7

7			
	7.1	Biogeography✓	(1)
	7.2	Gondwanaland✓	(1)
	7.3	The fossils of Mesosaurus/ Glossopteris/Cynognathus✓ are found on both South America and Africa✓	(2)
	7.4	Glossopteris✓	(1)
			(5)

Topic: Biosphere to ecosystem

Activity 1

Give the correct **biological term** for each of the following descriptions.

No.	Description	Biological Term
1.1	Any region with the distinct climate together with all the organisms that live in that	Biome✓
1.2	The movement of energy from one trophic level to another in a food chain	Energy flow✓
1.3	The path taken by the energy as it passes from one organism to other in ecosystem	Food chain✓
1.4	Several food chains linked together to show all possible pathway of energy flow	Food web✓
1.5	Animals that feed only on plant material	Herbivore✓
1.6	The part of the biosphere that is made up of the waters of seas, lakes and rivers	Hydrosphere✓
1.7	The soil and rocks forming the upper layers of the earth's surface	Lithosphere✓
1.8	The study of all the interaction or relationship within the ecosystem	Ecology✓
1.9	The air surrounding the earth's surface	Atmosphere✓
1.10	Non-living resources of the ecosystem	Abiotic✓
1.11	All the living organisms within an ecosystem	Biotic✓
1.12	Organisms that feed on meat only	Carnivore✓
1.13	Organisms that feed on both meat and plants	Omnivore✓
1.14	Organisms that live in or around water	Aquatic✓
		14X1 **(14)**

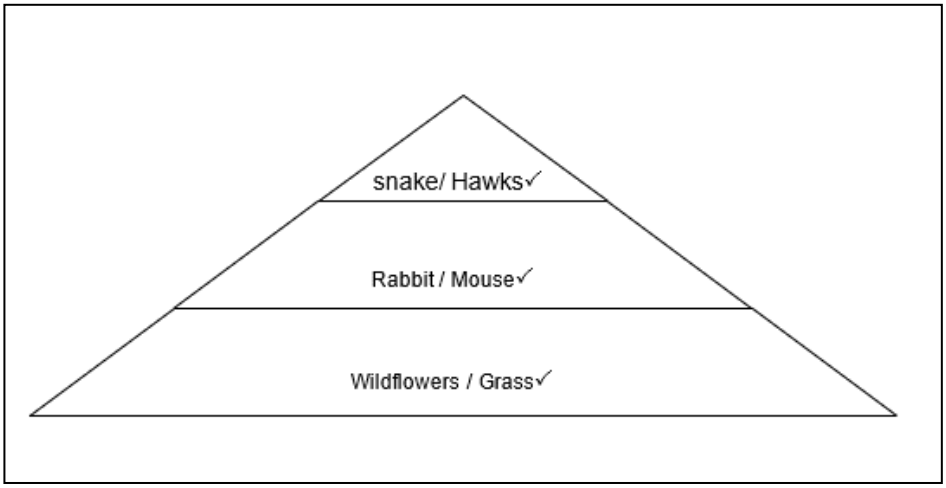
Activity 2

2			
	2.1	(a) Grasshopper✓	(1)
		(b) Plant ✓	(1)
	2.2	- Snakes cannot produce their own food ✓ - they depend on other organisms for food ✓	(2)
	2.3	- Population of grasshopper will increase✓ - since there are no birds to eat them ✓ - Leading to decrease in the population of plants ✓ - Since grasshopper population has increased ✓ **Any (3)**	(3)
			(7)

Activity 3

3			
	3.1	Grass ✓	(1)
	3.2	Springbok ✓/ Zebra	(1)
	3.3	There would be fewer predators ✓ Which would cause there to be more springbok and zebra ✓ This would lead to an increase in the lion population ✓	(3)
			(5)

Activity 4

4			
	4.1	Food web✓	(1)
	4.2	A well-defined area ✓ in which there is a close interaction between the plants, animals and the environment	(2)
	4.3	(a) Rabbit✓ /Mouse (Any 1) (b) Hawk ✓	(1) (1)
	4.4	 Food pyramid✓	(4)
	4.5	- They are a source of food for rabbit and mouse ✓, they will need to find another source of food ✓ or emigrate. This will affect the snake and hawk as they depend on them for food too ✓. - The food chain/web will collapse ✓ **OR** - The rabbit and mouse will die first, ✓ then there will be no food for the snake and hawk, ✓ and they will die ✓ or emigrate✓ (Any 2)	(2)
			(11)

Activity 5

5			
	5.1	Soil Z✓	(1)
	5.2	- Soil Z has moderate water holding capacity ✓ - has high humus content ✓ - has medium air spaces ✓ **(Mark the first TWO only)**	(2)
	5.3	200 - 60 = 140 ✓ $\frac{140}{200} \times 100\%$✓ = 70% ✓	(3)
			(6)

Activity 6

6			
	6.1	Oxygen cycle ✓	(1)
	6.2	(a) Carbon dioxide ✓	(1)
		(b) Oxygen ✓	(1)
	6.3	(a) - An increase in gas A/ carbon dioxide ✓ - cause an increase in temperature ✓ - leading to global warming ✓	(3)
		(b) - stop burning fossil fuels ✓ - plant trees✓ - carbon mineralisation ✓ - direct air capture ✓ **(Mark the first TWO only)**	(2)
			(8)

Activity 7

7			
	7.1	- Leaves are thick and fleshy✓ – to reduce transpiration rate✓ - Leaves have a thick cuticle✓ – to reduce transpiration rate ✓ -Leaves have thorns on them✓ – to reduce transpiration rate ✓ - Leaves have sunken stomata✓ – to reduce transpiration rate. ✓ **(Any 1 x 2)**	(2)
	7.2	The North-facing slope receives more direct sunlight ✓ and is drier than the South-facing slope ✓/are warmer ✓ due to evaporation✓	(2)
	7.3	(a) Aspect is the direction that the slope is facing. ✓	(1)
		(b) Altitude is the height above sea level. ✓	(1)
	7.4	- Sunlight✓ /Climate	(1)
			(7)

Activity 8

8			
	8.1	(a) water holding capacity✓	(1)
		(b) Soil samples✓	(1)
	8.2	25 ml✓	(1)
	8.3	Coarse sand	(1)
	8.4	Repeating the investigation✓ Having more than One set up of each soil sample✓ Used average reading✓ **(Mark first Two only)**	(2)
	8.5	No air✓ No oxygen available for respiration✓ Leading to rotting/ death of plant roots✓	(3)
	8.6	Equal amount of water in each soil type✓ Same amount of soil type✓ Same apparatus✓ **(Mark first Two only)**	(2)
			(11)

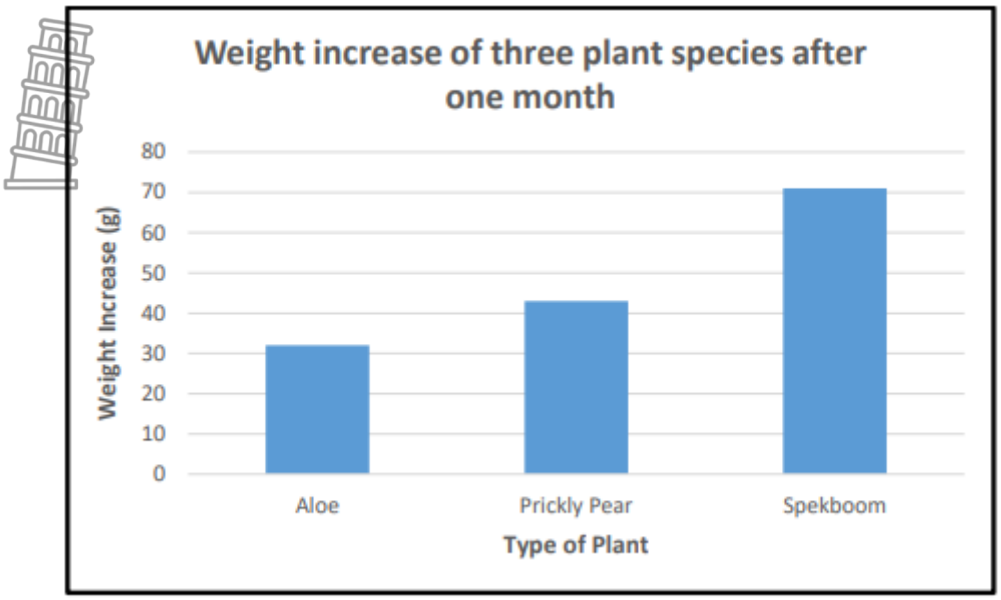
Activity 9

9			
	9.1	- Carbon dioxide is trapped by plants for photosynthesis ✓ - Carbon dioxide is converted into organic compounds such as starch and glucose which contain carbon ✓ - Carbon is stored in living organism as organic compounds ✓ such as proteins, carbohydrates, fats. ✓ - Animals get their carbon by eating plants or other animals ✓ - Decomposers get their carbon by from dead remains of other living organism ✓ - Carbon is stored in fossil fuels such as coal, oil and natural gas ✓ - When we burn fossil fuels carbon is returned to the atmosphere as carbon dioxide ✓ **(Any 5)**	
			(5)

Activity 10

10			
	10.1	- Nitrogen- fixing bacteria and lightning ✓ -convert N2 into nitrate✓ -Nitrate absorbed by plants are used to make plant proteins✓ - which are then consumed by animals and converted into animal protein✓ -Animals release waste products such as urine and faeces ✓from their body - When decomposers break down waste and dead bodies of organisms✓ -nitrogen is released into the soil as ammonia ✓ -Nitrite bacteria ✓ -convert ammonia into nitrite✓ - Nitrate bacteria✓ - convert nitrites into nitrates✓ -nitrates are absorbed by plants again✓ -denitrifying bacteria✓ -in the soil convert nitrates into nitrogen gas✓ - which is released back into the atmosphere ✓ **(Any 8)**	
			(8)

Activity 11

11			
	11.1	Type of plant✓	(1)
	11.2		
		Mark Allocation:	
		Type of Graph (T) — 1 Mark Caption (C) Both variables included — 1 Mark X and Y axis labels and Y axis unit (L) — 1 Mark X and Y axis scales and bars same width (S) — 1 Mark Plotting of points (P): No bars plotted correctly — 0 Marks 1–2 bars plotted correctly — 1 Mark All bars plotted correctly — 2 Marks	(**6**)
	11.1	They chose plants of the same height Π	(1)
		They put the plants in equal sized pots	
		All plants had the same type of soil Π	
		All plants had the same amount of soil Π	
		All plants were in the same location	
		All plants received the same amount of water Π	
		Mark first TWO only (Any 2)	(2)
	11.2	Increase the sample size Π and repeat the experiment	(1)
	11.3	71 800 × 100 Π = 8,88% Π	(2)
	11.4	they use it to create organic compounds Π / carbohydrates	
		which they use to grow	
		The more they grow the more they gain weight	(2)
		(ANY 2)	
			(8)

Topic: Biodiversity and Classification

Activity 1

No.	Description	Biological Term
1.1	The sorting and grouping of organisms according similarities and differences	**Classification**
1.2	The large variety of living organisms found on Earth.	**Biodiversity**
1.3	Species found in one area and nowhere else in the world	**Endemic**
1.4	Species that occurs naturally in a habitat	**Indigenous**
1.5	Organisms that do not have a true nucleus	**Prokaryote**
1.6	The study of past and present distribution of biological organisms in the world	**Biogeography**
		(6x1)=6

Activity 2

2.1	Mammalia✓	(1)
2.2	Panthera leo Name: Panthera leo✓ Underlined✓	(2)
2.3	To avoid confusion✓ / be accurate as common names vary from region to region✓	(2)
		(5)

Activity 3

3.			
	3.1	A – Baboon✓	(1)
		B – African Penguin✓	(1)
		C – Leopard✓	(1)
		D - Elephant✓	(1)
			(4)

Activity 4

4			
	4.1	(a) Protista✓	(1)
		(b) Chitin✓	(1)
		(c) Cellulose ✓	(1)
		(d) Autotrophic ✓	(1)
	4.2	Has a true nucleus✓	(1)
			(5)

Activity 5

5			
	5.1	Carolus Linnaeus✓	(1)
	5.2	(a) Genus /Genera✓	(1)
		(b) Species✓	(1)
	5.3	Mammalia/ Mammals✓	(1)
	5.4	Common characteristics / features✓	(1)
			(5)

Activity 6

6			
	6.1	Monera✓	(1)
	6.2	Plantae✓	(1)
	6.3	Prokaryote✓	(1)
	6.4	Eukaryote✓	(1)
	6.5	Eukaryote✓	(1)
	6.6	Unicellular✓	(1)
	6.7	Multicellular✓	(1)
	6.8	Saprophytic✓	(1)
	6.9	Autotrophic✓	(1)
	6.10	Paramecium cordatum✓ (Must be underlined separately)	(1)
			(10)

Activity 7

7			
	7.1	Mammalia✓	(1)
	7.2	Panthera leo	
		Name: Panthera leo✓	(1)
		Underlined✓	(1)
	7.3	To avoid confusion✓ / be accurate	(1)
		as common names vary from region to region✓	(1)
			(5)