

MEMORANDUM

SUBJECT:

LIFE SCIENCES P2 (10832)

1.5

1.5.1 30%/10%✓
= 3✓:1✓

(3)

TYPE OF WASTE ✓	PERCENTAGE(%) COMPOSITION✓
Organic matter	30✓
Plastic	25✓
Other	20✓

✓(only those asked in question put in table)

Rubric

Caption	1 mark
Both columns headings	2 marks 1 mark each
Type of waste (only those being asked)	1 mark
Each entry with correct percentage	3 marks 1 mark each
Table format	1 mark

1.5.2 **Table showing the percentage composition of certain household waste from a community**✓ ✓(table)

(8)

1.6

1.6.1 Different scientists may make different **interpretations**✓ of the same data✓

(2)

1.6.2 *Australopithecus afarensis* lived about three million years ago/
Australopithecus africanus evolved from *Australopithecus afarensis*✓

Homo heidelbergensis lived about one million years ago/
Homo heidelbergensis evolved from *Homo ergaster* ✓

(2)

1.6.3 *Homo erectus* evolved from *Australopithecus afarensis* in Model 1✓
Homo erectus evolved from *Homo ergaster* in Model 2✓

(2)

1.6.4 *Homo erectus* had:

- a larger brain case✓
- a less prominent brow ridge✓
- a more parabolic jaw✓
- Flatter face✓
- No skull ridge✓
- Human teeth/small molars/no large canines✓

MARK FIRST TWO ONLY

(2)

(8)

TOTAL SECTION A: [50]

SECTION B**QUESTION 2**

2.1

2.1.1 All have:

- gill pouches/slits✓
- tail✓
- bronchial grooves✓
- developing notochord/ nerve cord ✓
- a fish-like heart✓

(MARK FIRST THREE ONLY) (3)

2.1.2 In the early stages of development of vertebrates there are marked similarities in structure / comparative embryology✓

It is quite difficult to tell the differences between embryos

This supports the idea that these organisms came from common ancestors✓ (2)

2.1.3 Comparative Anatomy/ homologous and analogous structures✓

Biochemistry/ Molecular Biology and genetics✓

Paleontology/ Fossil records✓

Biogeography✓

Vestigial organs✓

(MARK FIRST FOUR ONLY) (4)

2.2

2.2.1 Natural Selection✓

(1)

2.2.2

- Mutations ✓
- Crossing over✓ (in prophase 1)
- Random assortment of chromosomes in metaphase 1✓
- Random Fertilisation✓
- Gene flow✓
- Genetic drift✓

(MARK FIRST THREE ONLY) (3)

2.2.3 **Allopatric/ geographic speciation**✓ - allopatric speciation is caused by populations of one species being geographically separate and then evolving differently/becoming reproductively isolated by geographical separation✓

Sympatric speciation✓ - is when populations are reproductively/genetically isolated by something other than geography✓

(4)

2.2.4

(i) Sympatric speciation

(1)

(ii) Hybridisation/ Polyploidy

(1)

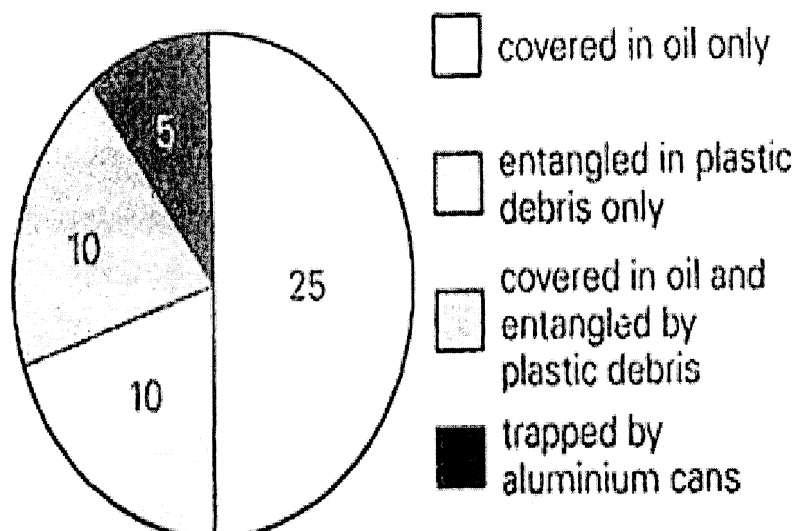
- 2.3
- 2.3.1 (a) Limbs not directly under body ✓ moves sideways ✓ (2)
(b) Long ✓ rib cage to tail ✓ (2)
- 2.3.2 Height = $\frac{\text{measured} \times \text{given scale length}}{\text{measured scale line}}$
- $$= \frac{80 \text{ mm} \checkmark \times 200 \text{ mm}/0,2 \text{ m} \checkmark}{10 \text{ mm} \checkmark}$$
- $$= 1\,600 \text{ mm}/16,0$$
- $$= 1,6 \text{ m} \checkmark$$
- OR
- $$= 8 \checkmark \checkmark \times 0,2 \text{ m} \checkmark = 1,6 \text{ m} \checkmark \quad (4)$$
- 2.3.3 - A /horse ✓
- longer legs ✓
- horse foot ends in hoof enabling speed across terrain ✓ (3)

[30]**QUESTION 3**

- 3.1.1 65 000 ✓ (1)
- 3.1.2 Drastic/steep ✓ decrease ✓ in the population (2)
- 3.1.3 Indiscriminate hunting ✓ for sport and leisure
Poaching ✓ for rhino horn (2)
- 3.1.4 Slight/ steady increase ✓ from 1994 up to 2010 ✓ (2)
- 3.1.5 Global Ban ✓ on import and export ✓ of rhino horn (2)
- 3.2.1 Oil ✓
Plastic (debris) ✓
(Aluminium) cans ✓ (MARK FIRST TWO ONLY) (2)
- 3.2.2 Covered with oil ✓ (1)
- 3.2.3 Engage in a clean-up campaign ✓
Put up posters on the water pollution problem ✓
Educate ✓ people (3)
- 3.2.4 Clean-up campaign - to encourage people to keep the harbour clean ✓
Posters – to make people aware ✓ of the dangers of polluting the harbour
Education – so they reduce pollution ✓ in the harbour (3)
- 3.2.5 Oil only $25/50 \times 100 \times 360 = 180^0 \checkmark$
Plastic only $10/50 \times 100 \times 360 = 72^0 \checkmark$

Oil and plastic $10/50 \times 100 \times 360 = 72^\circ \checkmark$
 Cans $5/50 \times 100 \times 360 = 36^\circ \checkmark$

Pie chart showing the proportion of birds affected by various pollutants



Rubric for the mark allocation of the graph

Calculation	1 mark for each calculation including correct answer (4)
Correct type of graph	1
Title of graph	1
Correct proportions for each labelled sector/slice	1 mark for each sector/slice (4)
Each sector/slice labelled or key given	1
Amount/Percentages on graph	1

(12)

[30]

TOTAL SECTION B: [60]

SECTION C**QUESTION 4**

- 4.1
- 4.1.1 Area of bed sampled✓
Sampling time✓
Size of net✓
Kicking action✓
Net position✓ (MARK FIRST TWO ONLY) (2)
- 4.1.2 Some animals not dislodged✓
Some animals missed /escaped net✓
Invertebrates difficult to identify✓
Invertebrates from outside area✓ (MARK FIRST TWO ONLY) (2)
- 4.1.3
- (i) 10✓ – 99✓ (2)
- (ii) No change (at sample 2 and 3) ✓/
decreased/0 (at sample 4) ✓/
increases to 10 – 99 (at samples 5, 6 and 7) ✓
and then to (more than) 100 (at samples 8 and 9) ✓ (4)
- (iii) Mayfly ✓ (1)
- (iv) Not found downstream of point where sewage enters stream✓
found only in the unpolluted water/not found in polluted water✓ (2)
- (v) Blackfly larvae✓ prefer/
grow better✓ in polluted water✓ (3)
- 4.2
- 4.2.1 Many offspring are produced✓ but not all reach adulthood/ Sexual maturity✓ (2)
- 4.2.2 Predator-prey/ predation✓ (1)
(3)
- 4.3.1 Carbon (14) dating/ radiometric dating ✓ and relative dating ✓ (2)
- 4.3.2 Artefacts e.g. stone tools/ pottery/ fire hearths✓
(MARK FIRST ONE ONLY) (1)

4.4 Possible answer

Mass extinction

The extinction of large numbers of species ✓
 over a relatively short period of time ✓
 as a result of a catastrophic event/massive change in environmental conditions. ✓

(3)

The asteroid impact theory

- The impact of a giant asteroid ✓ crashing into the earth about 65 million years ago ✓ produced such a vast dust cloud ✓ that the earth became cold and dark. ✓
- The asteroid penetrated the earth's crust, scattering dust and debris into the atmosphere. It also resulted in increased volcanic activities, earthquakes and tsunamis ✓ with high winds and acid rain. ✓ The chemical composition of the atmosphere changed. ✓ The concentration of sulphuric and nitric acid, as well as fluorides increased. ✓
- The impact from the blast ✓ would have resulted in the burning and destruction of everything in its path. ✓ (ANY3)

Volcano Theory

According to evolutionists:

The three greatest mass extinctions occurred at times when serious volcanic activities occurred ✓

It is thought that the eruptions threw up huge clouds of rock and lava ✓ which would have caused the death ✓ of many life forms ✓ (ANY 3)

(3)

Possible explanations

- The dust and debris in the atmosphere would have blocked out the sun's rays ✓ and lowered the temperature on earth. ✓
- Plant species that rely directly on the sunlight for photosynthesis would have been first to be negatively affected. ✓
- As the plants began to die out, the herbivores ✓ feeding on the plants would run out of food, resulting in their starvation/death. ✓ This would affect food availability for animals higher up in the food chain. ✓ Initially they would feed on dead carcasses and eventually each other. ✓ The situation would not be sustainable and their numbers would also begin to decline. ✓

- Less plants also would have resulted in **less oxygen** ✓ being released during photosynthesis ✓ and this would have placed the animals with higher oxygen demands under stress, causing suffocation/death, ✓ because of the lower levels of oxygen in the environment.

ANY 6 (6)

The following rubric will be used to assess the synthesis in the essay

MARKS	DESCRIPTION
3	All 3 aspects discussed with no irrelevant information
2	2 aspects only discussed and contains some irrelevant information
1	Discussed 1 aspect only and contains much irrelevant information
0	Not attempted/nothing written other than question number/absolutely no correct information

(3)

[40]

TOTAL: 150

LIFE SCIENCES
(Second Paper)

MEMORANDUM

SECTION A

QUESTION 1

- 1.1
- 1.1.1 A✓✓
- 1.1.2 D✓✓
- 1.1.3 C✓✓
- 1.1.4 D✓✓
- 1.1.5 D✓✓
- 1.1.6 B✓✓ 6x2=(12)
- 1.2
- 1.2.1 Food web✓
- 1.2.2 Fossil Fuels✓
- 1.2.3 Autotrophic (organisms)✓ / Producers
- 1.2.4 Deforestation✓
- 1.2.5 Poaching✓
- 1.2.6 Biological control✓
- 1.2.7 Population✓ (7)
- 1.3
- 1.3.1 F✓
- 1.3.2 E✓
- 1.3.3 D✓
- 1.3.4 B✓
- 1.3.5 A✓
- 1.3.6 M✓
- 1.3.7 K✓ (7)
- 1.4
- 1.4.1 homologous✓ (1)
- 1.4.2 The organs have similar structure ✓
but different functions✓ (2)
- 1.4.3 The bones in the forelimbs have similar✓ structure/ layout
therefore they probably share a common ancestor✓ (2)

VAK:	LEWENSWETENSKAPPE V2 (10832)
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MEMORANDUM

-

Minder plante sal ook veroorsaak dat **minder suurstof** deur fotosintese in die atmosfeer vrygestel word ✓ en dit sal organismes wat meer suurstof nodig het onder stres plaas/ Moonlike versmoring✓/dood as gevolg van die laer vlakke van suurstof in die atmosfeer. ✓

ENIGE 6

(6)

Die DRIE punte vir die sintese van die opstel word soos volg toegeken:

PUNTE	BESKRYWING
3	Bespreek 3 aspekte met geen irrelevante inligting nie
2	Bespreek slegs 2 aspekte en bevat sommige irrelevante inligting
1	Bespreek slegs 1 aspek en bevat baie irrelevante inligting
0	Nie probeer nie/niks geskryf buiten vraagnommer nie/geen korrekte inligting nie.

(3)

[40]

TOTAAL: 150

Massa-uitstewing

Die uitsterwing van groot hoeveelhede spesies oor 'n relatiewe kort tydperk

as gevolg van 'n katastrofiese gebeurtenis/verandering in omgewings toestande.

(3)

Die asteroidimpak-teorie

- In Groot asteroide het 65 miljoen jaar gelede op die aarde geval en 'n groot stofwolk veroorsaak en die aarde koud en donker gemaak.

- Die asteroide het die aardkors binnegedring, en stof en afval in die atmosfeer versprei. Dit het aanleiding gegee tot vulkaniese aktiviteite/aardbewings / en tsunamis met sterk winde en suurreën. Die chemiese samestelling van die atmosfeer het verander. Die konsentrasie van swaelsuur/ salpetersuur/ floriede het vermeerder.

- Die impak van die asteroïede-val sou alles in sy pad verbrand en vernietig het.

(3)

Vulkaniese teorie

Volgens evolusioniste:

Het die drie grootste massauitsterwings in 'n tydperk plaasgevind toe daar groot vulkaniese aktiviteite was

Die uitbarstings het groot hoeveelhede vulkaniese wolke van rots en lava vrygestel wat die dood van verskeie lewensvorme veroorsaak het

(3)

Moontlike verduidelikings

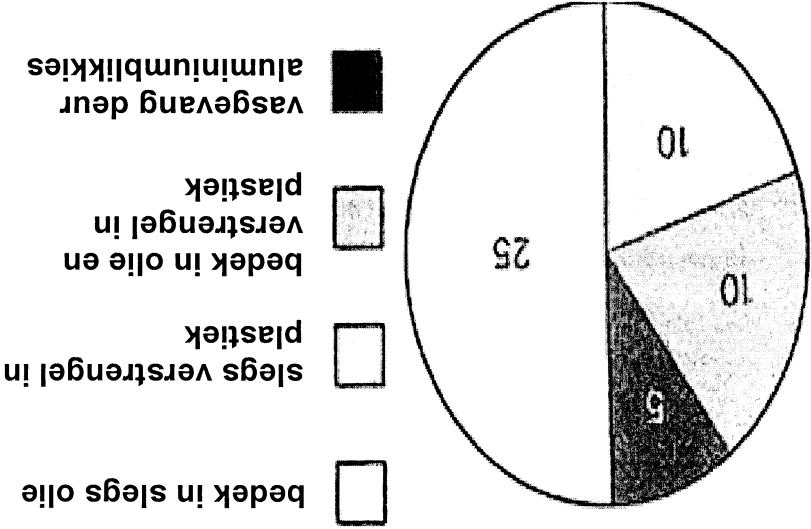
- Die stof en afval in die atmosfeer het die sonstrale geblokkeer en sodoende die temperatuur van die aarde verlaag.
- Plantspesies wat op sonlig staatmaak, kon nie meer fotosinteseer nie.
- Soos wat die plante uitsterf, het die herbivore nie voedsel om te eet nie. Dit sal die voedselketting in die voedselketting se trofiese vlakke beïnvloed. Organismes sal lewe op dooie karkasse en hulle eie spesies. Die situasie is nie volhoubaar nie en die getalle sal ook begin afneem.

AFDeling C**VRAAG 4**

4.1	4.1.1	Die areagroote van die bodemonster✓ Tyd wat die monster geneem is✓ Groote van die net✓ Skopaksie ✓ Posisie van die net✓ (MERK SLEGS EERSTE TWEE)	(2)
	4.1.2	Sommige invertibrata is nie uitgedryf nie✓ Sommige invertibrata het die net ontdek✓ Invertibrata is moeilik om te identifiseer✓ Invertibrata kan moontlik van ander areas wees✓ (MERK SLEGS EERSTE TWEE)	(2)
	4.1.3		
		(i) 10✓ – 99✓	(2)
		(iii) Geen verandering (by monsters 2 en 3) ✓/ Verminder/0(by monster 4) ✓/ Verminder tot 10 – 99 (by monsters 5, 6 en 7) ✓ Verminder tot meer as 100 (by monsters 8 en 9) ✓	(4)
		(iiii) “Eendagsvlieg”✓	(1)
		(iv) Word nie stroom-af gevind vanwaar die riool die stroompie binnegedring het nie✓ Word slegs in onbesoedelde water gevind/word nie in besoedelde water gevind nie✓	(2)
		(v) Swartmuggielarwes✓ verkies/ grootj beter✓ in besoedelde water✓	(3)
4.2	4.2.1	Baie nakomelinge word geproduseer✓ maar nie almal bereik volwassenheid / geslagrypheid nie✓	(2)
	4.2.2	Predator-prooi-verwantskap/ predasie✓	(1)
	4.3.1	Koolstof(14)-datering/ radiometriese datering ✓ en relatiewe datering	(2)
	4.3.2	Kunswerke bv. klipgereedskap/ potte/ vuurherde✓ (MERK SLEGS EERSTE EEN)	(1)

Olie en plastiek $10/50 \times 100 \times 360 = 72^\circ \checkmark$
Blikkies $5/50 \times 100 \times 360 = 36^\circ \checkmark$

'n Sirkelgrafiek wat die verhouding van voëls aandui wat deur verskillende besoedelings geaffekteer is.



Rubriek vir toekenningspunte vir die grafiek

Berekening	1 punt vir die korrekte berekening asook die korrekte antwoord (4)
Tipe grafiek moet korrek wees	1
Opskrif van die grafiek	1
Korrekte verhouding van elke sektor op grafiek	1 punt vir elke sektor (4)
Elke sektor benoem/sleutel word verskat	1
Getal/persentasie op die grafiek	1

(12)
[30]
[60] TOTAAL AFDELING B:

- 2.3
- 2.3.1 (a) Ledemate is nie direk onder die liggaam nie✓ beweeg sywaarts ✓ (2)
- (b) Lang ✓ ribbekas wat strek tot by die stert✓ (2)

2.3.2 Hoogte = gemete x skaallengte wat verskaf is

skaallyn

$$= \frac{80 \text{ mm} \checkmark}{200 \text{ mm}/0,2 \text{ m} \checkmark} \times \frac{10 \text{ mm} \checkmark}{1600 \text{ mm}/16,0}$$

$$= 1,6 \text{ m} \checkmark$$

OF

$$= 8 \checkmark \times 0,2 \text{ m} \checkmark = 1,6 \text{ m} \checkmark$$

- 2.3.3 - A/perd ✓
- langer bene✓
- die perd se pote eindig in hoeë wat hom vinniger oor 'n terrein kan laat beweeg✓ (3)

[30]

VRAAG 3

- 3.1.1 65 000✓ (1)
- 3.1.2 Drastiese/skerp✓ daling ✓ in die bevolking (2)
- 3.1.3 Nie geregleerde jag✓ vir sport en ontspanning
- Wilddiestal ✓ vir renosterhoring (2)
- 3.1.4 Klein/ geleidelike toename✓ van 1994 tot en met 2010✓ (2)
- 3.1.5 Algehele wêreldverbod✓ op die invoer en uitvoer van renosterhoring (2)
- 3.2.1 Olie✓
- Plastiek (afval)✓
- (Aluminium) blikke✓ (2)
- (MERK SLEGS EERSTE TWEE)
- 3.2.2 Bedek met olie✓ (1)
- 3.2.3 Deur 'n skoonmaakveldtog te beplan✓
- Deur plakkate op te sit wat die waterbesoedlingsprobleem verduidelik ✓
- Deur mense op te voed✓ (3)
- 3.2.4 Skoonmaakveldtog – om mense aan te moedig om die hawe skoon te hou ✓
- Plakkate – om mense in te lig ✓ oor die gevare van die besoedeling in die hawe
- Opvoeding – om besoedeling in die hawe te verminder (3)
- 3.2.5 Slegs olie
- Slegs plastiek
- $$25/50 \times 100 \times 360 = 180^\circ \checkmark$$
- $$10/50 \times 100 \times 360 = 72^\circ \checkmark$$

AFDELING B**VRAAG 2**

2.1	2.1.1	Almal besit:	
	2.1.2	- kieuksplete✓ - sterfte✓ - bronchiale groewe✓ - ontwikkelende notochorda/ senuweekoord ✓ - in visagtige hart✓	(3)
	2.1.3	Vergelykende Anatomie/ homoloë en analoë strukture✓ Biochemie/ Molekulêre Biologie en genetika✓ Paleontologie/ Fossielrekords✓ Biogeografie✓ Onontwikkelende/ oorblyfselforgane✓ (MERK SLEGS DIE EERSTE VIER)	(4)
	2.2	2.2.1	Natuurlike Seleksie✓
	2.2.2	- Mutasies ✓ - Oorkruising✓ (in profase 1) - Willekeurige rangskikking van chromosome in metafase 1✓ - Willekeurige bevrugting✓ - Geenvloei/migrasie✓ - Geenverskuiwing✓ (MERK SLEGS DIE EERSTE DRIE)	(3)
	2.2.3	Allopatrise/ geografiese spesiering ✓ - allopatrise spesiering word veroorsaak deurdat 'n spesie van 'n bevolking geografies geskei word en dan anders ontwikkel Simpatriese spesiering ✓ – is wanneer bevolking deur iets anders as geografiese obstakles reproduktief/geneties geïsoleer word ✓	(4)
	2.2.4	(i) Simpatriese spesiering (ii) Hibridisasie/ Poliploïede	(1) (1)

1.5
1.5.1 30%/10%✓ = 3✓:1✓
(3)

TYPE AFVAL ✓	PERSENTASIE (%) SAMESTELLING✓
Organiese materiaal	30✓
Plastiek	25✓
Ander	20✓

✓ (slegs afval wat in vraag gevra is, is in tabel geplaas)

Rubriek

Opskrif	1 punt
Beide kolomopskrifte	2 punte 1 punt elk
Tipe afval (slegs die wat gevra is)	1 punt
Elke inskrywing met korrekte persentasie	3 punte 1 punt elk
Tabelformaat	1 punt

1.5.2 Die tabel toon die persentasie samestelling van sekere huishoudelike afval in die gemeenskap aan✓ (tabel)

(8)

1.6
1.6.1 Verskillende wetenskaplikes kan verskillende interpretasies ✓ maak van dieselfde data✓
(2)

1.6.2 *Australopithecus afarensis* het drie miljoen jaar gelede geleef/ *Australopithecus africanus* het voor *Australopithecus afarensis*✓ ontwikkel
Homo heidelbergensis het ongeveer 1 miljoen jaar gelede geleef/ *Homo heidelbergensis* het voor *Homo ergaster* ✓ ontwikkel
(2)

1.6.3 *Homo erectus* het ontwikkel uit *Australopithecus afarensis* in Model 1✓ *Homo erectus* het ontwikkel uit *Homo ergaster* in Model 2✓
(2)

1.6.4 *Homo erectus* het:

- 'n groter breinholte✓
- 'n minder prominente oogbank✓
- 'n meer geronde kakebeen✓
- 'n platter gesig✓
- Geen skedelrif nie✓
- Menslike tande/klein maaltande (koutande)/geen groot kanini (slagtande)✓

MERK SLEGS EERSTE TWEE

(8)

TOTAAL AFDELING A: [50]

LEWENSWETENSKAPPE
(Tweede Vraastel)

MEMORANDUM

AFDELING A

VRAAG 1

1.1	A✓✓		
1.1.1	D✓✓		
1.1.2	C✓✓		
1.1.3	D✓✓		
1.1.4	B✓✓		
1.1.5			
1.1.6			
1.2			
1.2.1			
1.2.2			
1.2.3			
1.2.4			
1.2.5			
1.2.6			
1.2.7			
1.3			
1.3.1			
1.3.2			
1.3.3			
1.3.4			
1.3.5			
1.3.6			
1.3.7			
1.4			
1.4.1			
1.4.2			
1.4.3			