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 = measured x given scale length / measured scale line

= 80 mm ✓ X 200 mm/0,2 m ✓ / 10 mm✓

= 1 600 mm/16,0

= 1,6 m ✓

OR

= 8✓✓ X 0,2 m✓ = 1,6 m✓ (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)

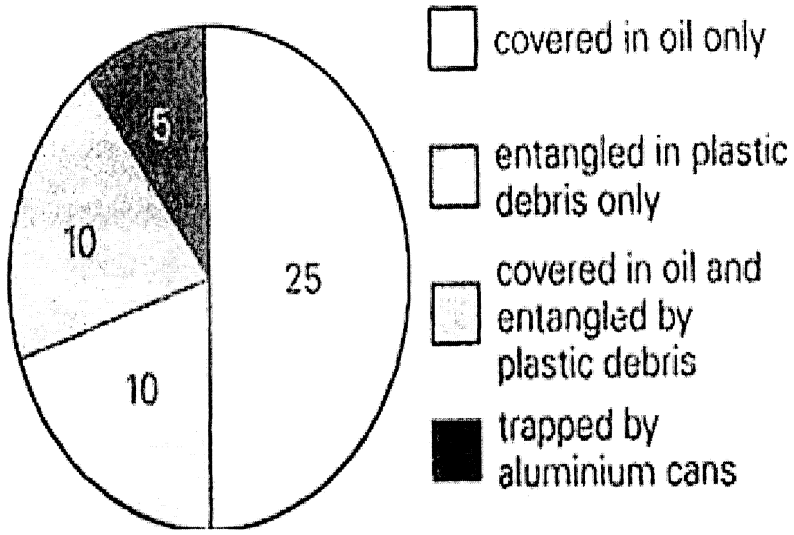
3.2.3 Engage in a clean-up campaign✓
Put up posters on the water pollution problem✓
Educate✓ people (3)

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 x 100 x 360 = 180^0✓
Plastic only 10/50 x 100 x 360 = 72^0✓

Oil and plastic $10/50 \times 100 \times 360 = 72^0$✓
Cans $5/50 \times 100 \times 360 = 36^0$✓

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)

MEMORANDUM

VAK:	**LEWENSWETENSKAPPE V2 (10832)**

- 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/ Moontlike 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

4.4 **Moontlike antwoord**

Massa-uitstewing

Die uitsterwing van groot hoeveelheid spesies ✓
oor 'n relatiewe kort tydperk ✓
as gevolg van 'n katastrofiese gebeurtenis/verandering in omgewingstoestande.✓ (3)

Die asteroiedimpak-teorie

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

- Die asteroïede het die aardkors binnegedring, en stof en afval in die atmosfeer versprei. Dit het aanleiding gegee tot vulkaniese aktiwiteite/aardbewings / en tsunami's ✓ 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. ✓ (ENIGE 3) (3)

Vulkaniese teorie

Volgens evolusioniste:

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

Die uitbarstings het groot hoeveelhede vulkaniese wolke van rotse en lawa vrygestel ✓ wat die dood✓ van verskeie lewensvorme ✓ veroorsaak het (ENIGE 3) (3)

Moontlike verduidelikings

- Die stof en die afval in die atmosfeer het die sonstrale geblokkeer ✓ en sodoende die temperatuur van die aarde verlaag. ✓
- Plantspesies wat op sonlig staatmaak, kon nie meer fotosinteer nie. ✓
- Soos wat die plante uitsterf, het die herbivore nie voedel om te eet nie ✓ Dit sal die voedselbeskikbaarheid 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 areagrootte van die bodemmonster✓
Tyd wat die monster geneem is✓
Grootte van die net✓
Skopaksie ✓
Posissie van die net✓ (MERK SLEGS EERSTE TWEE) (2)

4.1.2 Sommige invertebrate is nie uitgedryf nie✓
Sommige invertebrata het die net ontduik✓
Invertebrata is moeilik om te identifiseer✓
Invertebrata kan moontlik van ander areas wees✓
(MERK SLEGS EERSTE TWEE) (2)

4.1.3

(i) 10✓ – 99✓ (2)

(ii) Geen verandering (by monsters 2 en 3) ✓/
Veminder/0(by monster 4) ✓/
Vermeerder tot 10 – 99 (by monsters 5, 6 en 7) ✓
Vermeerder tot meer as 100 (by monsters 8 en 9) ✓ (4)

(iii) "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/
groei beter✓ in besoedelde water✓ (3)

4.2

4.2.1 Baie nakomelinge word geproduseer✓ maar nie almal bereik volwassenheid / geslagsrypheid nie✓ (2)

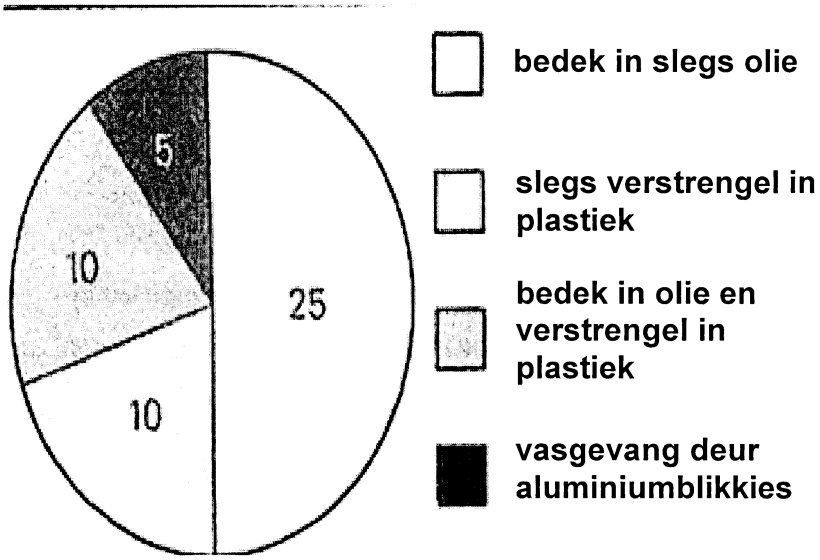
4.2.2 Predator-prooi-verwantskap/ predasie✓ (1)

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 x 100 x 360 = 72^0✓
Blikkies 5/50 x 100 x 360 = 36^0✓

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



Rubriek vir toekenningpunte 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 verskaf	1
Getal/persentasie op die grafiek	1

(12)

[30]

TOTAAL AFDELING B: [60]

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 gemete x skaallengte wat verskaf is
skaallyn

= 80 mm ✓ X 200 mm/0,2 m ✓
10 mm✓

= 1 600 mm/16,0

= 1,6 m ✓

OF

= 8✓✓ X 0,2 m✓ = 1,6 m✓ (4)

2.3.3
- A /perd ✓
- langer bene✓
- die perd se pote eindig in hoewe 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 gereguleerde jag✓ vir sport en ontspanning
Wilddiefstal ✓ 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✓ (MERK SLEGS EERSTE TWEE) (2)

3.2.2 Bedek met olie✓ (1)

3.2.3 Deur 'n skoonmaakveldtog te beplan✓
Deur plakkate op te sit wat die waterbesoedelingsprobleem 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 25/50 x 100 x 360 = 180^0✓
Slegs plastiek 10/50 x 100 x 360 = 72^0✓

AFDELING B

VRAAG 2

2.1

2.1.1 Almal besit:

- kieusplete✓
- sterte✓
- bronchiale groewe✓
- ontwikkelende notochorda/ senuweekoord ✓
- 'n visagtige hart✓ (MERK SLEGS DIE EERSTE DRIE) (3)

2.1.2 In die beginstadium by die ontwikkeling van vertebrate is daar heelwat ooreenkomste in sekere strukture / vergelykende embriologie ✓
Dit is moeilik om die verskille tussen die embrio's te identifiseer en dit ondersteun die gedagte dat hierdie organismes gemeenskaplike voorouer moes gehad het.✓ (2)

2.1.3 Vergelykende Anatomie/ homoloë en analoë strukture✓
Biochemie/ Molekulêre Biologie en genetika✓
Paleontologie/ Fossielrekords✓
Biogeografie✓
Onontwikkelende/ oorblyfselorgane✓ (MERK SLEGS DIE EERSTE VIER) (4)

2.2

2.2.1 Natuurlike Seleksie✓ (1)

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 **Allopatriese/ geografiese spesiëring**✓ - allopatriese spesiëring word veroorsaak deurdat 'n spesie van 'n bevolking geografies ✓geskei word en dan anders ontwikkel
Simpatriese spesiëring✓ – is wanneer bevolking deur iets anders as gegrafiese obstruksies reproduktief/geneties geïsoleer word ✓ (4)

2.2.4 (i) Simpatriese spesiëring (1)
(ii) Hibridisasie/ Poliploïede (1)

1.5

1.5.1 30%/10%✓
= 3✓:1✓ (3)

TIPE 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 (2)
(8)

TOTAAL AFDELING A: [50]

LEWENSWETENSKAPPE
(Tweede Vraestel)

MEMORANDUM

AFDELING A

VRAAG 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	Voedselweb ✓	
1.2.2	Fossielbrandstowwe ✓	
1.2.3	Outotrofiese (organismes)✓/ Produseerders	
1.2.4	Ontbossing✓	
1.2.5	Wilddiefstal/ Stelery/ Stropery✓	
1.2.6	Biologiese beheer✓	
1.2.7	Bevolkingsgroep✓	(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	homoloog✓	(1)
1.4.2	Die organe het dieselfde strukture ✓ Maar verskillende funksies✓	(2)
1.4.3	Die bene in die voorste ledemate het dieselfde ✓ strukture/ uitleg dus deel hulle moontlik 'n gemeenskaplike voorouer✓	(2)