

See back cover for an English translation of this cover

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90928M



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

SUPERVISOR'S USE ONLY

Koiora, Kaupae 1, 2013

90928M Te whakaatu māramatanga ki ngā ariā koiora e pā ana ki te hurihanga ora o ngā tipu whaipua

9.30 i te ata Rāpare 14 Whiringa-ā-rangi 2013
Whiwhinga: Whā

Paetae	Paetae Kaiaka	Paetae Kairangi
Te whakaatu māramatanga ki ngā ariā koiora e pā ana ki te hurihanga ora o ngā tipu whaipua.	Te whakaatu māramatanga hōhonu ki ngā ariā koiora e pā ana ki te hurihanga ora o ngā tipu whaipua.	Te whakaatu māramatanga matawhānui ki ngā ariā koiora e pā ana ki te hurihanga ora o ngā tipu whaipua.

Tirohia mehemea e ōrite ana te Tau Ākongā ā-Motu (NSN) kei tō pepa whakauru ki te tau kei runga ake nei.

Me whakautu e koe te KATOĀ o ngā pātai kei roto i te pukapuka nei.

Ki te hiahia koe ki ētahi atu wāhi hei tuhituhi whakautu, whakamahia te (ngā) whārangi kei muri i te pukapuka nei, ka āta tohu ai i ngā tau pātai.

Tirohia mehemea kei roto nei ngā whārangi 2–15 e raupapa tika ana, ā, kāore hoki he whārangi wātea.

HOATU TE PUKAPUKA NEI KI TE KAIWHAKAHAERE HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

TAPEKE

MĀ TE KAIMĀKA ANAKE

Kia 60 meneti hei whakautu i ngā pātai o tēnei pukapuka.

PĀTAI TUATAHI: TE RUINGA HAE¹

He tapu tēnei rauemi. E kore taea te tuku atu. Aata tirohia ki ngā kupu kei raro iho i te pouaka nei.

Tirohanga mōkitokito o te hae e kawea ana e te hau.

www.flickr.com/photos/zeissmicro/7138583767/sizes/o/in/photostream/

He tapu tēnei rauemi. E kore taea te tuku atu. Aata tirohia ki ngā kupu kei raro iho i te pouaka nei.

E purea ana te hae mai i tētahi putiputi.

www.naturalvisions.co.uk/ImageDetail.aspx?imdet=43015

He tapu tēnei rauemi. E kore taea te tuku atu. Aata tirohia ki ngā kupu kei raro iho i te pouaka nei.

Tirohanga mōkitokito o te hae e kawea ana e te ngāngara.

www.profimedia.si/photo/electron-micrograph-of-groundsel-pollen/profimedia-0094794016.jpg

He tapu tēnei rauemi. E kore taea te tuku atu. Aata tirohia ki ngā kupu kei raro iho i te pouaka nei.

E hahaetia² ana te putiputi e tētahi pī.

<http://adamnoosa.redbubble.com/sets/80081/works/4480088-honey-bee-in-flight>

Whakatauritehia ngā tukanga rui hae i roto i ngā tipu ka hahaetia mā te hau me ngā tipu ka hahaetia mā te ngāngara.

I tō whakautu me:

- whakaahua i te ruinga hae
- whakamārama i ngā rerekētanga i waenga i te hae ka hahaetia mā te hau me te hae o ngā tipu ka hahaetia mā te ngāngara
- whakamārama i te tōtika o te tikanga ruirui o ngā hanganga hae ka hahaetia mā te hau me te hae o ngā tipu ka hahaetia mā te ngāngara
- matapaki i ngā rerekētanga i waenga i ngā putiputi ka hahaetia mā te hau me ngā putiputi ka hahaetia mā te ngāngara mā te whakataurite i tō rāua tōtika ki ā rāua tikanga ruinga hae.

¹ haenga

² whakaaitia

You are advised to spend 60 minutes answering the questions in this booklet.

QUESTION ONE: POLLINATION

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Microscopic view of pollen transferred by wind.

www.flickr.com/photos/zeissmicro/7138583767/sizes/o/in/photostream/

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Pollen being blown from a flower.

www.naturalvisions.co.uk/ImageDetail.aspx?imdet=43015

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Microscopic view of pollen transferred by insect.

www.profimedia.si/photo/electron-micrograph-of-groundsel-pollen/profimedia-0094794016.jpg

*For copyright reasons,
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Flower being pollinated by a bee.

<http://adamnoosa.redbubble.com/sets/80081/works/4480088-honey-bee-in-flight>

Compare and contrast the process of pollination in wind-pollinated and in insect-pollinated plants.

In your answer you should:

- describe pollination
- explain the differences between the pollen from wind-pollinated plants and from insect-pollinated plants
- explain how the pollen structures of wind-pollinated plants and of insect-pollinated plants are suited to their method of dispersal
- discuss the differences between wind-pollinated and insect-pollinated flowers by comparing how they are suited to their methods of pollination.

PĀTAI TUARUA: WHAKATŌ

Ka puaki te whakatō i muri i te ruinga hae.

(a) Whakaahuahia he aha te whakatō.

(b) Whakamāramahia he pēhea te whakatō i roto i ngā tipu.

Ka taea e koe tētahi hoahoa whai tapanga te whakamahi.

(c) Matapakitia he pēhea te huri o te hanganga o te putiputi e te whakatōnga, ā, he aha i hira ai tēnei ki ētahi momo ruirui kākano rerekē e RUA i te itinga rawa.

I tō whakautu me:

- whakamārama mai he aha ngā putanga ki te putiputi **i muri** i te whakatōnga, ā, he aha i hira ai tēnei ki te ruirui kākano
- whakamārama i te hiranga o te ruirui kākano ki te tipu.

QUESTION TWO: FERTILISATION

Fertilisation occurs after pollination.

(a) Describe what fertilisation is.

(b) Explain how fertilisation occurs in plants.

You may include a labelled diagram.

(c) Discuss how fertilisation changes the structure of the flower, and why this is important to at least TWO different types of seed dispersal.

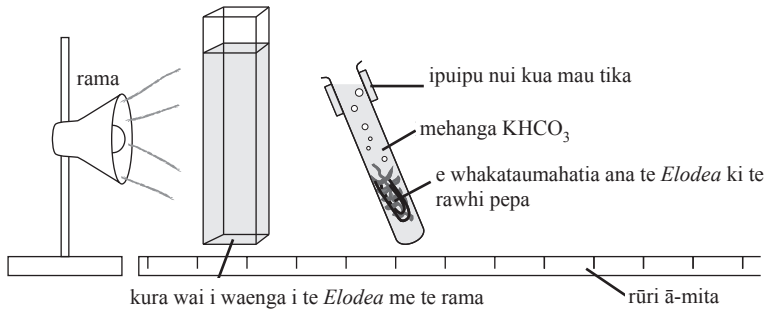
In your answer you should:

- explain what happens to the flower **after** fertilisation, and why this is important to seed dispersal
- explain the importance of seed dispersal to the plant.

PĀTAI TUATORU: AHOTAKAKAME

I te tūhura ētahi ākonga tau 11 i te pānga o te kaha tūrama ki te ahotakakame. I tāpirihia te *Elodea* (taru hāora) ki tētahi mehanga konurehe hauwai pākawa waro (KHCO_3) mā te whakahaere i te whakamātauranga e whakaaturia ana i raro. E whakaaturia ana ngā kitenga o te whakamātauranga i te papataui i raro.

Hoahoa hei whakaatu i te whakahaere whakamātauranga



He mea urutau mai i: www.nuffieldfoundation.org/practicalbiology/investigating-factors-affecting-rate-photosynthesis

Ngā tirohanga o ngā pūtau rau *Elodea*

He tapu tēnei raue-mi. E kore taea te tuku atu. Aata tirohia ki ngā kupu kei raro iho i te pouaka nei.

http://botit.botany.wisc.edu/botany_130/Plant_cell/Elodea.html

Ngā kitenga:

Tawhiti mai i te rama (henemita)	Kaha tūrama (lux)	Te maha o ngā pupū korohū i te meneti			
		Whakamātau 1	Whakamātau 2	Whakamātau 3	Toharite
5	2400	47	46	48	47
10	2200	46	48	47	47
15	2000	44	46	45	45
20	1800	44	42	43	43
25	1600	41	42	39	41
30	1400	40	34	37	37
35	1200	35	36	34	35
40	1000	33	34	32	33
45	800	27	25	26	26
50	600	18	16	17	17
60	400	12	10	11	11

(a) Tātarihia ngā kitenga o te whakamātauranga me te pānga o te huri i te kaha tūrama ki te ahotakakame o te tipu *Elodea*.

I tō whakautu me:

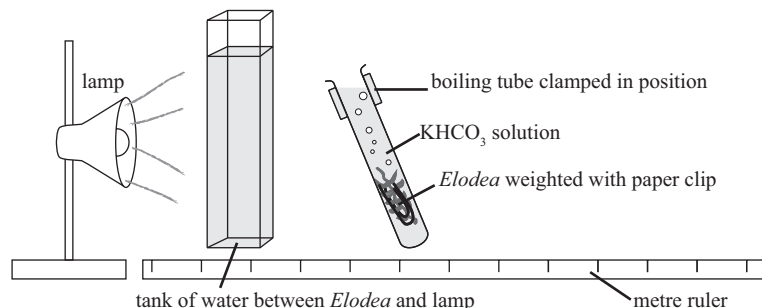
- whakaahua i te tukanga ahotakakame
- whakamārama i te take i hira ai te ahotakakame mō te *Elodea*
- whakamārama i te āhua o te pānga o ngā kaha tūrama rerekē ki te whakanaonga pupū korohū i roto i te *Elodea*
- matapaki i te hiranga o ngā pupū korohū i roto i tēnei whakamātauranga me te whakahāngai ki te ahotakakame.

- (b) Whakamāramahia mai he aha i whakamahia ai he mehanga konurehe hauwai pākawa waro (KHCO_3) i roto i tēnei whakamātauranga.

QUESTION THREE: PHOTOSYNTHESIS

Two Year 11 students were investigating the effect of light intensity on photosynthesis. *Elodea* (oxygen weed) was added to a solution of potassium hydrogen carbonate (KHCO_3) using the experimental set-up shown below. The results from the experiment are shown in the table below.

Diagram to show the experiment set-up



adapted from www.nuffieldfoundation.org/practicalbiology/investigating-factors-affecting-rate-photosynthesis

Views of *Elodea* leaf cells

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this resource cannot be
reproduced here.

http://botit.botany.wisc.edu/botany_130/Plant_cell/Elodea.html

Results:

Distance from lamp (cm)	Light intensity (lux)	Number of gas bubbles per minute			
		Trial 1	Trial 2	Trial 3	Average
5	2400	47	46	48	47
10	2200	46	48	47	47
15	2000	44	46	45	45
20	1800	44	42	43	43
25	1600	41	42	39	41
30	1400	40	34	37	37
35	1200	35	36	34	35
40	1000	33	34	32	33
45	800	27	25	26	26
50	600	18	16	17	17
60	400	12	10	11	11

- (a) Analyse the results of the experiment and the impact that changing the light intensity has had on photosynthesis of the *Elodea* plant.

In your answer you should:

- describe the process of photosynthesis
- explain why photosynthesis is important for *Elodea*
- explain how changing light intensity affects gas bubble production in *Elodea*
- discuss the significance of bubbles in this experiment and relate it to photosynthesis.

- (b) Explain why a solution of potassium hydrogen carbonate (KHCO_3) was used in this experiment.

English translation of the wording on the front cover

Level 1 Biology, 2013

90928 Demonstrate understanding of biological ideas relating to the life cycle of flowering plants

9.30 am Thursday 14 November 2013

Credits: Four

90928M

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of biological ideas relating to the life cycle of flowering plants.	Demonstrate in-depth understanding of biological ideas relating to the life cycle of flowering plants.	Demonstrate comprehensive understanding of biological ideas relating to the life cycle of flowering plants.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–15 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL

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