*See back cover for an English translation of this cover*

1

90948M

909485

SUPERVISOR'S USE ONLY

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

# Pūtaiao, Kaupae 1, 2012

## 90948M Te whakaatu māramatanga ki ngā ariā koiora e pā ana ki te rerekētanga ā-ira

9.30 i te ata Rāhina 19 Whiringa-ā-rangi 2012
Whiwhinga: Whā

| Paetae | Paetae Kaiaka | Paetae Kairangi |
|---|---|---|
| Te whakaatu māramatanga ki ngā ariā koiora e pā ana ki te rerekētanga ā-ira. | Te whakaatu māramatanga hōhonu ki ngā ariā koiora e pā ana ki te rerekētanga ā-ira. | Te whakaatu māramatanga matawhānui ki ngā ariā koiora e pā ana ki te rerekētanga ā-ira. |

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

**Me whakautu e koe ngā pātai KATOA 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 2–19 e raupapa tika ana, ā, kāore hoki he whārangi wātea.

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

Merit.

**TAPEKE** 21

MĀ TE KAIMĀKA ANAKE

© Mana Tohu Mātauranga o Aotearoa, 2012. Pūmau te mana.
Kia kaua rawa he wāhi o tēnei tuhinga e tāruatia ki te kore te whakaaetanga a te Mana Tohu Mātauranga o Aotearoa.

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

MĀ TE KAIMĀKA ANAKE

## PĀTAI TUATAHI: HANGANGA IRANGA

Ka whakaatu te kauwhata i raro nei i te hononga i waenga i ngā pūira, ngā ira me te pītau-ira (DNA).

**He tapu tēnei pikitia mā konei kua noho mai ko ngā whakautu noa a te ākonga.**

Ka whakaatu ake te Pia nei i te whanaungatanga i waenganui ingā Pītau IRA nga Pūira. Ka whakaatu ake kia toru ake ngā pū korero e hangai ana ki te patai.

http://www.newbornscreening.info/Pro/genetics

(a) Whakamāramahia ngā hononga i waenga i te pītau-ira, ngā pūira me ngā ira.

Ka taea e koe te tāpiri tuhipoka, tapanga hoki ki te hoahoa o runga hei tautoko i tō whakautu.

Ko te pūira, he tātai i ngā tohutohu kia hanga i te pūmua, kia hanga i te āhuatanga o te rauropi. Ko te pītau ira ngā tohutohu ka tātaihia e te ira, mā ngā tohu reta A (adenine) T (thymine) G (glucoamine) me te C (cytosine). Ka tūhono te A me te T, ka tūhono hoki te G, me te C. Ko ngā pūira ka noho tata ki tōna hoa, ahakoa te aha, ko tētahi wāhanga o te pūira he nahanga ka whakatinanahia é te rauropi i tana momo āhuatanga. Kia whakawhāiti i te pikitia o tētahi ~~chromoso~~ pūira ka kite i te ira. Ki te whakāiti ake, ka kite koe i te Pītau ira. Ki te whakawhāiti anō, ka kite koe i te hanga o te A, T me te G, C.

(b) Whakamāramahia he pēhea ka puta ai ngā āhuatanga rerekē i ngā hononga i tō whakautu mō te (a), ā, he pēhea te whai wāhi atu ki te **rerekētanga ā-ira**.

MĀ TE KAIMĀKA ANAKE

I tāku tuhinga i tuhia au e pā ana ki te A, T, G, me te C. ki te miki rapu ēra hei tauira. T, A, G C, C, G, T, A ā, ki te tohu tīra i te āhuatanga ō te kanohi, ka rere kē ki te āhua o te A, T A, T G, C G, C, ā tēra pea koira te tohu mō te kanohi o tētahi atu. A, ~~kit~~ ki te kaiwe tētahi i te Pitau ira ōrite, ā, ki te pā tētahi matemaremare ki tauā momo hanga o te pitau ira, ka mate te katoa. Heoi, nā te rerekē, kāore e tino pā ai te matemaremare ki ētahi, nō reira ka tāea te kimi rongoā. Ka kite koe i te rerekētanga-ā-ira i waenga i ngā rōpu nui pēra ki Tamaki-Makaurau.

E8

MĀ TE KAIMĀKA ANAKE

## PĀTAI TUARUA: NGĀ TAUIRA O TE TUKUNGA IHO

Ko te mate ā-toto ka hua mai i ngā pūtau toto whero he rerekē, he piko (sickle) te āhua ka tuku iho mā tētahi ira kotahi, e rua pea ōna āhuaira, he pūnoa, he piko rānei.

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

pūtau toto whero pūnoa  pūtau toto āhua piko

www.lifebridgeblogs.org/2011/09/16/national-sickle-cell-awareness-month/

Whakamahia a '**H**' hei tohu i te irarā 'pūnoa' ngoi, me te '**h**' hei tohu i te irarā 'piko' ngoikore.

(a) Whakamāramahia he pēhea te whai pēpi pūtau toto āhua piko a ngā mātua whai pūtau toto pūnoa.

I tō whakautu, me:

- tuhi te tohuira o te tamaiti whai pūtau toto āhua piko
- tuhi ngā tohuira o ngā mātua pūnoa **e rua**
- tā mai tētahi tūtohi tukutuku (Punnett) hei whakaatu he pēhea te whai pēpi pūtau toto āhua piko a ngā mātua pūnoa.

// Ko te tohuira mō te tamaiti ko te hh
Mō ngā Mātua ko te Hh.
Ko te take ~~i pēhea ngā~~ ka tāea ngā mātua te whānau-mai i tētahi pēpi ho ~~rerekē tūna~~ toto āhua piko tāna, nā te mea kua huna te irarau ki roto i ngā mātua. Kāore rātau e whakahinanahia i te āhuatanga nā te iwia ho irarau kaha te irarau mō te toto whero pūnoa. /

(b) Tokowhā ngā tamariki a ngā mātua i te wāhanga (a), he pūtau toto āhua piko katoa ō rātou. E wahahia ana tā rāua tamaiti tuarima.

MĀ TE KAIMĀKA ANAKE

(i) Whakamāramahia ka pēhea te puta i ngā mātua pūnoa ngā tamariki TOKOWHĀ he pūtau toto āhua piko ō rātou.

Me kōrero koe mō tō tūtohi tukutuku o (a) i tō whakautu.

I te tūtohi tukutuku, ka kite he 25% ka whānau mai tētahi pēpi he pūtau toto āhua piko āna, ahakoa he 25% te tūtaurenga, kua whānau ké mai kia 4 ngā tamariki kua pā ki te toto āhua piko. Heoi, e mōhio ana ia wā ka whānau mai tētahi, e toru anake ngā ara kua tūkotohia, ā, he matapōkore te kōwhiringa o ana ara.

(ii) Whakamāramahia te tūponotanga kei te tamaiti tuarima ngā pūtau toto āhua piko.

E 25% orau tonu te tūtaurenga, ahakoa kua pā ki te teenga o āna tuakana/tuahine kūore tēra e tīni ana i te tūtaurenga ā te tūtohi tukutuku.

Ka whakaatu mai te pia nei e rua ngā kupu aria Ka korero ake mo te ~~pitau piko~~ putau toto ahua piko me te kore tirihanga i te tutohi tukutuku

MC

## PĀTAI TUATORU: TE WHAKAPUTA URI TŌRUA ME TE ORANGA TONUTANGA

MĀ TE KAIMĀKA ANAKE

Whakamāramahia he pēhea nei te puta o te rerekētanga ā-ira i te whakaputa uri tōrua, Ā, he aha i pai ake ai te oranga tonutanga o ngā momo i tēnei.

I tō whakautu me whai whakaaro koe ki:

- ngā tukanga o te hanganga pūtau hema (arā, te whāiti pūira) me te whakatōnga
- te taurangitanga o te taupori mā te whakaputa uri tōrua
- te hononga i waenga i te rerekētanga ā-ira me te oranga tonutanga o tētahi momo.

Ka taea e koe te whakamahi hoahoa, tuhipoka hoki hei tautoko i tō whakautu.

Ki te rerekē ngā irara ā ngā mātua, ka rerekē hoki ngā irara ā te ~~tamariki~~ uri whakaeke. Ki te rerekē ngā irara o te Uri whakaeke, ~~ka~~ ā ka pā ~~te matemaremare~~ tētahi momo matemaremare ki te irara ā ~~ngā~~ te māma, ka pau te ora ā te pēpi me te pāpa. He tāpua tēnei, nā te mea, ki te ōrite a mātau ira katoa, ā, ki te pā te matemaremare ki tētahi momo ira, ka pā ki te katoa. He tāpua tēra ki te oranga o te katoa.

Ka whakamaramama te pia nei te rerekētanga o nga irairā. me te matemaremare ka pa mai ki te oranga o nga iranga katoa

MĀ TE KAIMĀKA ANAKE

A3

## PĀTAI TUAWHA: TE REREKĒTANGA Ā-IRA

MĀ TE KAIMĀKA ANAKE

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

**Rākau hāmā**
www.sciencephoto.com/media/371575/enlarge

**Rākau uriuri**
http://amusedartichoke.wordpress.com/2011/04/15/egos-and-evolution/

E rua ngā tohuāhua o tētahi momo pepe, he tea, he uriuri hoki. Ka kainga ngā pepe tea, uriuri hoki e ngā manu.

Whakamāramahia he pēhea te āwhina a ngā tohuāhua e rua o te momo pepe kia ora haere tonu te taupori mēnā **ka rerekē haere te taiao**, ā, ka uriuri ake ngā rākau katoa e nōhia e ngā pepe.

I tō whakautu, me:

- tautuhi te kupu 'tohuāhua'
- whakamārama he pēhea te āwhina a te tae kia ora haere tonu ngā pepe takitahi
- whakamārama he aha e pā ai te uriuri haere ake o ngā rākau, ki te ōwehenga o ngā tohuāhua ki te taupori pepe i roto i te wā.

// Ko te tohuāhua ngā kupu e whakamāramia ana i te āhuatanga e whakatinanahia ē te rauropi. Ka āwhina te tae i ngā pepe takitahi i te pō, i te rā. Rānei. E taea ana ngā pepe takitahi hāmā te huna mai i ngā manu i te rā, ā e taea te ~~uriuri~~ pepe uriuri te huna mai i ngā manu i te pō. Ki te huri kōaro te rā me te pō, ka mate nā te mea e tāra te manu te kimi i a rātau. Ki te ~~pō~~ uriuri ake ngā rākau, ka mate ngā pepe hāmā. Ki te hāmā ake ngā rākau ka mate ngā pepe uriuri. ~~Nā te~~ Ki te uriuri ~~ake ngā~~ //



A4

## QUESTION FOUR: GENETIC VARIATION

ASSESSOR'S USE ONLY

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

**Light-coloured tree**
www.sciencephoto.com/media/371575/enlarge

**Dark-coloured tree**
http://amusedartichoke.wordpress.com/2011/04/15/egos-and-evolution/

A species of moth has two phenotypes, light and dark. Both light and dark moths are eaten by birds.

Explain how the two phenotypes of the species of moth help the population to survive if the **environment changes** and all the trees on which the moths live become darker.

In your answer you should:

- define phenotype
- explain how colour helps individual moths to survive
- explain why the environmental change to darker trees, affects the ratio of the phenotypes in the moth population over time.

Ka whakamaraama tia tova nga ahuatanga o te patai tuarua