

TAU 7-10

Te Tūhura Hangarau Kōmaruhiko

Discovering Solar PV Technology



TIROHANGA WHĀNUI

E ārahi ana tēnei rauemi ako uiui i ngā ākonga ki te tūhura hangarau kōmaruhiko me ōna whakamahinga whakamīharo me ngā mea ka taea mō te Rau tau 21, ā, ki tua atu hoki. Ka kōrero tēnei rauemi mō te pūtake o ngā kupu onamata e pā ana ki ngā kupu pūtaiao maha, ka mutu ka āta tiro tiro ki te mātauranga matū, ngā āhuatanga ōkiko me te ahupūngao koia nei te tūāpapa o tēnei hangarau.

NGĀ HONO O TE MARAUTANGA O AOTEAROA

NGĀ WĀHANGA AKO:	NGĀ WHĀINGA PAETAE:	NGĀ TAUMATA:	NGĀ TAU:
Pūtaiao: Te Āhua o te Pūtaiao: Te whakawhitiwhiti kōrero i roto i te Pūtaiao: Te Whai Wāhi me te Whakatakoto Whakaaro	Te whakamahi i ngā tūmomo kupu whānui, ngā tohu me ngā tikanga. Te whakawhanake i te mārama ki ngā take pūtaiao-pāpori mā te kohikohi i ngā mōhiohio pūtaiao hāngai hei whakatakoto whakatau mai i ngā whakaaturanga me te kōkiri mahi ina tika ana.	5-6	7-10
Pūtaiao: Te Ao Matū: Te Hanganga o te Matū: Mātauranga Matū me te Iwi Whānui	Whakaahuatia te hanganga o ngā ngota o ngā pūmotu rerekē. Honoa ngā āhuatanga o ngā rōpū rerekē o ngā matū ki te āhua e whakamahia ana i te iwi whānui, e pā mai rānei i te ao tūroa.	5-6	7-10
Pūtaiao: Ao Ahupūngao: Te Whakamahi Ahupūngao: Ngā Ariā Ahupūngao	Te hōpara i te whakamahinga hangarau o te ahupūngao. Te tautuhi me te whakaahua i ngā tauira e pā ana ki ngā putaputa āhua ka kitea i ngā āhuatanga o ia rā e pā ana ki te hiko me te aho.	5-6	7-10

NGĀ MŌHIOHIO MĀ TE KAI AKO:

Me whakamahi tēnei rauemi i te taha o te **PEPA MEKA** Hiko Whakahou mai i Ngā Pūtau Papa Kōmaruhiko. Me whakamahi ngā ākonga i te pepa meka me ngā hono e tāpiri ana i roto i tā rātou uiui hei whakautu i ngā pātai arotahi kei te pepamahi ākonga.

Mō ngā uiui iti e whā me whakahaere rangahau whakamārama hāngai ngā ākonga mō te take ahuwhānui o te hangarau papa kōmaruhiko. E 3, e 4 rānei ngā pātai “tautoko” hei whiriwhiri i mua i te whakautu i te pātai matua. Ka āwhina tēnei i ngā ākonga ki te wetewete i te pātai matatini ki ngā wāhanga tauwhāiti iti ake.

1. Ka ārahi te uiui tuatahi i ngā ākonga ki te whiriwhiri i te pūtake o te kupu photovoltaic (papa kōmaruhiko), ā, ka kitea i te aho Te Āhua o te Pūtaiao o te Marautanga o Aotearoa, i te mea he whakahau i te ākonga kia whai whakaaro ki te whaitake o ngā kupu tauwhāiti me tōna whakamārama tika me te mōhio hoki ki te horopaki tuku iho.

E tohu ana ngā kuputuhi miramira **karaka** i tētahi hono ki ētahi rauemi atu anō. Mēnā kua tāngia e koe tēnei rauemi, me hoki ki schoolgen.co.nz/for-teachers/resources/ hei toro atu ki ngā rauemi kua honoa.

2. Ka ārahi te uiui tuarua i ngā ākonga kia mōhio ki ngā tūmomo whakamahinga rerekē o te hiko e puta ana i te rā mai i tētahi tātaitai pūkoro ki te Teihana Ātea ā-Ao. Ka tonoa hoki ngā ākonga kia whai whakaaro ki ngā āhuatanga whai hua mō te whakamahi i te hiko kōmaru i ō rātou ake ao.
3. Ka ārahi te take uiui tuatoru i te whiriwhiri a ngā ākonga i te ahua o te whai pānga o ngā āhuatanga matū e whakamahia ana i ngā papa kōmaruhiko ki ngā hanga matū, ā, he aha te hāngai o tēnei ki te whakamahinga.
4. Mō te uiui whakamutunga ka whakaaroaro ngā ākonga mō ngā āhuatanga ōkiko o te whakanao i ā rātou ake pūngao hiko i te kāinga – e hia te nui o te iraruke kōmaru ka whiwhi i tō rātou tuanui, e hia pea tō rātou horahanga whakateraki, ā, e hia te nui o te pūngao hiko ka taea pea e rātou te whakanao?

Ngā koronga ako

E ako ana ngā ākonga ki te:

- Whakahaere i tā rātou ake uiui ā-pūtaiao ki ngā hangarau hira mō te whakamahi i te pūngao o te rā hei whakanao hiko.
- Whiriwhiri he aha te hangarau papa kōmaruhiko, ā, he pēhea te whakamahi.

Paearu angitu

Ka taea e ngā ākonga te:

- Whakamārama ngā whakamahinga hangarau papa kōmaruhiko.
- Āhukahuka ngā whakamahinga rerekē o te hiko e whakanaotia ana e te kōmaru.
- Rapu māramatanga he aha te pānga o ngā papa kōmaruhiko ki te hanganga matū.
- Whakataurite te whakamahinga pūngao hiko i tō rātou kāinga ki tētahi kāinga e whakamahi ana i te pūngao whakahou.

Ngā rauemi e hiahiatia ana

Hiko Whakahou mai i Ngā Pūtau Papa Kōmaruhiko - [Hono](#)

Raumahi Ākonga - [Hono](#)

Ngā Whakautu a te Kaiako

E tohu ana ngā kuputuhi miramira [karaka](#) i tētahi hono ki ētahi rauemi atu anō. Mēnā kua tāngia e koe tēnei rauemi, me hoki ki schoolgen.co.nz/for-teachers/resources/ hei toro atu ki ngā rauemi kua honoa.



Raumahi Ākonga
Hono

Te tūhura Hangarau Papa Kōmaruhiko me ōna Whakamahinga

Uiui 1

Matapakitia te tikanga me te pūtake o te kupu pūtaiao “photovoltaic” (papa kōmaruhiko)?

Whakautua ngā pātai tautoko 1A, 1B me te 1C i raro.

Whakamahia te **PEPA MEKA Hiko Whakahou mai i Ngā Pūtau Papa Kōmaruhiko** hei āwhina i a koe ki te rangahau i ngā mōhiohio mō ēnei pātai.

Ohia manomanotia ō whakaaro ki konei:



Raumahi Ākonga

Ngā pātai tautoko 1A

He aha ngā kupu “iti” e 2 kei te kupu photovoltaic? He aha tōna tikanga? He aha tōna pūtake? He aha ētahi atu kupu e whakamahia ana i tōna pū: photo?

Pātai tautoko 1B

Whakamārama mai he aha te rerekē o te papa kōmaruhiko ki te papa kōmaru e whakawera ana i te wai? (Me whakaaro pea mō ngā takahuritanga pūngao)

Pātai tautoko 1C

He aha ki ō whakaaro e whakamahia nei e ngā tohunga pūtaiao ngā kupu tauhou nō Kirihi Onamata, o ētahi atu pūtake o nehe rānei?



Raumahi Ākonga

Uiui 2

He aha ētahi whakamahinga pai, auaha rānei mō ngā papa kōmaruhiko?

Whakautua ngā pātai tautoko 2A, 2B, 2C me te 2D i raro.

Whakamahia te **PEPA MEKA Hiko Whakahou mai i Ngā Pūtau Papa Kōmaruhiko** me ngā hono i raro hei āwhina i a koe ki te rangahau i ngā mōhiohio mō ēnei pātai.

Ohia manomanotia ō whakaaro ki konei:

- Wakarererangi Kōmaru: [Hono](#)
- Poti Kōmaru: [Hono](#)
- Waka-waka Kōmaru Iti: [Hono](#)





Raumahi Ākonga

Pātai tautoko 2A

Tuhia kia 5, neke atu rānei ngā wāhi e whakamahia ai pea te hangarau papa kōmaruhiko:

Ngā pātai tautoko 2B

I te tau 2012 i huri taiāwhio tētahi poti i te ao mā te whakamahi pūngao kōmaru anake. I te tau 2016 i rere taiāwhio tētahi wakarererangi pūngao kōmaru i te ao. He aha tā rātou e whakaatu ana mō te hangarau papa kōmaruhiko?

I āu ake kupu, whakamāramahia ēnei waka e rua me te ara i haeretia ai.

Ngā pātai tautoko 2C

He aha ētahi atu pūrere tāhiko, i tua atu i ngā pūtau kōmaruhiko, me whakamahi pūngao hiko kia tutuki ai ngā whāinga nui o ēnei mahi mātātoa?



Raumahi Ākonga

Pātai tautoko 2D

Whakamahia te pūngao kōmaru ki tōu ake ao: Me pēhea tōu ake whai hua i te hangarau kōmaruhiko? (Me whaitake, me auaha hoki/rānei!)



Raumahi Ākonga

Uiui 3

Tautuhia ngā matū hira ka whakamahia hei hanga me te tiaki i ngā pūtaiao kōmaruhiko.

Whakautua ngā pātai tautoko 3A, 3B, 3C me te 3D i raro.

Whakamahia te **PEPA MEKA Hiko Whakahou mai i Ngā Pūtau Papa Kōmaruhiko** me ngā hono i raro hei āwhina i a koe ki te rangahau i ngā mōhiohio mō ēnei pātai.

Ohia manomanotia ō whakaaro ki konei:

- Taka Pūmotu: Hono
- He pēhea te hono o ngā pūtau kōmaruhiko mai i ngā papa kōmaru me ngā huānga kōmaru: Hono
- Hangaia āu ake papa kōmaruhiko: Hono



Raumahi Ākonga

Ngā pātai tautoko 3A

Ko tēhea te pūmotu matū noa ka whakamahia hei hanga i tētahi pūtau kōmaruhiko noa?
Tuhia te tohu matū, te tau ngota me te tau papatipu, ka tuhi i tōna hanga ngota.
E hia ngā irahiko kei roto i te anga āpiti (o waho)?
He aha ngā momo hononga matū ka mahia me ētahi atu ngota momo ōrite?

Pātai tautoko 3B

He aha ngā tauhohe matū ka taea te whakamahi hei tango i te pūmotu e hiahiatia ana mai i ētahi atu ngota i roto i te kirikiri?

Pātai tautoko 3C

He aha te pūmotu matū ka tino whakamahia hei kawehiko mai i runga (pānga whakamua) o te pūtau kōmaruhiko ki te ara iahiko?



Raumahi Ākonga

Ngā pātai tautoko 3D

Ka taea e koe te hoko pūtau kōmaruhiko ka hanga i āu ake papa engari me kimi e koe he āhuatanga hei tiaki i ngā pūtau kōmaruhiko tino mōwhaki. Kia whai take ai me mātua tiaki e ngā matū pakari ake.

E tiakina ana mai i te aha?

E hia te roa e hiahiatia ana kia ora?



Raumahi Ākonga

Uiui 4

E hia te nui o te hiko ka taea e ngā papa kōmaruhiko te whakanao i taku tuanui?

Whakautua ngā pātai tautoko 4A - E i raro.

Whakamahia te **PEPA MEKA Hiko Whakahou mai i Ngā Pūtau Papa Kōmaruhiko** hei āwhina i a koe ki te rangahau i ngā mōhiohio mō ēnei pātai.

Ohia manomanotia ō whakaaro ki konei:



Raumahi Ākonga

Pātai tautoko 4A

Whakarārangitia mai ngā takahuritanga pūngao kei roto i tētahi pūtau kōmaruhiko whakanao hiko. Whakaaturia ia hātepe mā tētahi hoahoa, pikitia rānei.

Ngā pātai tautoko 4B

E hia te nui o te pūngao kōmaru ka whitingia ki te wāhi e noho ana koe?
E hia te rerekē o tēnei mai i te raumati ki te takurua? (Ka hiahia pea koe ki te whakaatu i tēnei mā tētahi kauwhata).

Ngā pātai tautoko 4C

Ka taea e tētahi papa kōmaruhiko kotahi, e ai ki te momo/tauira, te whakanao tētahi ngaohiko tata ki te 30 wae ngaohiko me tētahi ia tata ki te 9 wae iahiko i ngā āhuatanga tino paki.
E hia te hiko e whakanaotia ana i ia papa?
Mēnā e 8 ngā papa e hono tahi ana (hātepe), e hia te hiko kei te whakanaotia e te pūnaha katoa?
Āta whakaaturia ngā mahinga katoa, ā, kia maumahara ki te tuhi i te wae hiko.



Raumahi Ākonga

Pātai tautoko 4D

Mēnā he 1.6 m te teitei me te 1.0 m whānui o ia papa kōmaruhiko, ā, e anga whakateraki tō tuanui mā ngā ahu o te 7.5 m mā te 5 m, e hia ēnei papa ka taea e koe te whakamau ki tō tuanui? (Tuhia te horahanga tuanui i te tuatahi.)

Pātai tautoko 4E

He aha te momo pūnaha kōmaruhiko ka tīpakohia e koe mō tō whare mēnā ka taea e koe?