

Kaupapa
Miharo

Wero Hiko

Ingoa o te rōpū:

Ngā tāngata
o te rōpū:

Ngohe 6.2: Te whakataetae Kaupapa Mīharo

Te wero:

Hangaia tētahi ataata, tētahi pānui whakaahua rānei e whakaatu ana i ngā kōrero mō tō haerenga i te wero nei. Ka uru koe ki te whiringa whakawhiwhi taonga, ā, ka whakaingoatia hoki koutou hei toa i te whakataetae Kaupapa Mīharo i tēnei tau.

Te ara whakauru

E wātea ana ia kura ki te whakauru i tētahi o ēnei:

1. He ataata
2. He pānui whakaahua

E uru ai koe, me oti i a koe:

- Ngā uiui o mua, o muri hoki i te wero

Kia auaha mai!

He whakaaro ēnei ka whai wāhi pea ki tō whakaurunga:

- 1) Whakamōhio mai i ngā tāngata o tō rōpū
- 2) He aha tāu i ako i te wero?
- 3) Whakaatuhia mai ō mahi

Tukua mai tō whakaurunga

- Mā tō kaiako, to māngai rānei e tuku atu tō whakaurunga whakataetae ki te rōpū Pukamata o te hapori o Wonder Project, tēnā, ko tēnei
- Tukua tō whakaurunga ki hello@wonderproject.nz

Te whakawākanga

Mā te Tima Mīharo e whakawā ngā whakaurunga katoa i te tau nei hei te Oketopa.

Ka whakataetae tō whakaurunga ki ētahi atu mai i ngā kaiwhakauru wero katoa, nō reira, kia kaha tō mahi!

Kia kaha ki a koe, ā, kia toa ko te rōpū pai katoa!

Ngohe 1.1: Tukua he pātai

Tīmata ai ngā ākonga PŪRAU i ā rātou kaupapa mā te tuku i ētahi pātai maha. Mā te pātai e mārāma ai rātou ki te raru e whakatikahia ana.

Ko te raru nui hei whakatika māu:

Me pēhea e kaha ake ai te muramura o te anamata?

Kia tīmata i te whakaaro ki ō whāinga, ā, me pēhea hoki te whakatutuki i aua whāinga rā.

He aha ā tātou whāinga?

Ko te whāinga matua, ko te whakahiko i tētahi hapori ki te pūngao whakahou mā te whakamahi i tētahi kapohau me tētahi papa hiko kōmaru. He aha te tikanga o te angitu ki tō rōpū?

Hei tauira: Ko tā tātou whāinga, ko te whakahiko i te hapori katoa ki te pūngao hau anahe.

He aha ngā pātai me tuku?

He aha ngā āhuatanga me whakamārama ake e tutuki ai i a koe ō whāinga?

Hei tauira: Ka pēhea te huri i te hau hei hiko?

He aha ngā raru me whakatikatika e tātou?

He aha ngā raru ka ara ake pea? Mā te whakaaro ki ērā e wawe ai pea te kite i tētahi rongoā.

Hei tauira: Me pēhea te whakapai ake i tā tātou hoahoa, ki te kore e whakaputa i te nui o te hiko e pīrangitia ana?

Ngohe 1.2: Te tūhura ngao

Kia rite ō whakaaro ki ō te kairapuhara kia kite ai koe i te pūngao i tō kura.

Atu i te rā e whiti ana, ki te pere e tangi mai ana, mā te pūngao e puta ai ngā mea katoa!

I tō rōpū, kimihia tētahi tauira o ia tūmomo pūngao. Tuhia iho tāu i kite ai, ā, he aha hoki i tika ai.

Ina kite koutou i tētahi tauira kāore i kitea e rōpū kē, ka whiwhi piro koutou. Ko te rōpū kei a ia te nuinga o ngā piro te toa!

Ngā tūmomo pūngao	He tauira	He whakamārama
Pūngao neke	He puna wai	E rere ana te wai, nō reira, he pūngao neke tōna
Pūngao aho		
Pūngao pōkākā		
Pūngao oro		
Pūngao hiko		
Pūngao neke		
He kōrero anō	He tauira	He whakamārama
Pūngao tō ā-papa		
Pūngao kūtotoro		
Ngā piro:		

Kōrero

Kia matapaki kōrua ko te tangata kei tō taha i ngā pātai.

Ko tēhea te tūmomo pūngao i nui ake ngā whakaaro ki tērā?

I kitea tētahi mea he nui ake i te pūngao kotahi kei taua mea rā? He aha taua mea rā, ā, he aha hoki ngā tūmomo pūngao kei taua mea rā?

Whakakapinga

E ngā ihumanea, he nui ngā raraunga kua kohia, me ngā akoranga kua mau, he rawe hoki ngā kapohau kua whakahikotia mai. Kua eke ki te wā e whakamahia ai ēnei mōhiotihiko ki te whakautu i te pātai o te wero.

Me pēhea te whakahiko i ngā rā kei te tū mai kia muramura ake ai?

Mā koutou, mā ngā ihumanea, e muramura mai ai ngā rā kei te tū mai.

Tātaritanga

Ko te nui o ngā rawa i kā mai i tō mātou akomanga

I pai katoa te mahi a te kapohau a

ingoa ā-rōpū

i te mea

Whakatairitenga whakapae:

I rite rānei ngā putanga ki tāu i whakapae ai? He aha ai/He aha i kore ai?

Ngohe 1.3: Ngā waka hererapa

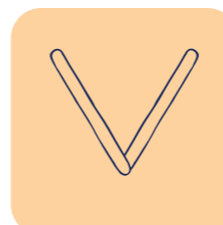
**Kāore e taea te pūngao te waihanga, te whakakore rānei,
engari ka taea te whakawhiti!**

Hoahoatia tētahi hanganga o tētahi waka iti, ā, tūhuratia te āhua o tā te pūngao whakawhiti i tētahi tūmomo pūngao ki pūngao kē.

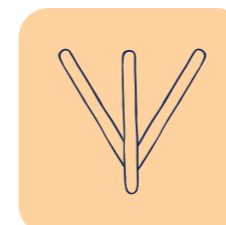
Me whai koe i ēnei mea:

- Kia 3 ngā rākau rarepapa
- Kia 1 te hererapa
- Kia 2 ngā pūrou rākau
- Kia 1 te ngongo kirihou
- Kia 4 ngā taupoki pātara, ētahi mea rānei e rite ana hei wīra
- He hāpiapia, he kutikuti, he kāpia wera
- He rūri, he taura ine rānei

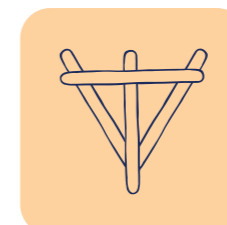
Hei mahi 1: Hangaia te anga o te waka



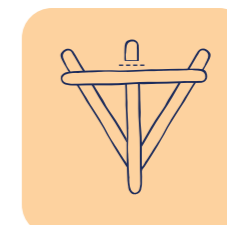
- Whakapiria ētahi rākau ahiparaka e rua ki te kāpia, kia rite ki te "V" te āhua



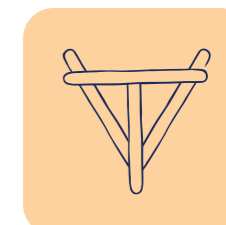
- Whakapiria tētahi rākau ahiparaka tuatoru ki waenga o te "V", kia 2 mitarau te kōturetanga mai i te pūtake o te "V"



- Whakapiria tētahi rākau ahiparaka anō, kia huapae te takoto mai, kia tata hoki ki te tihi o te "V", ā, me whakawhiti ngā rākau e toru



- Tapahia te mutunga o te rākau o waenga

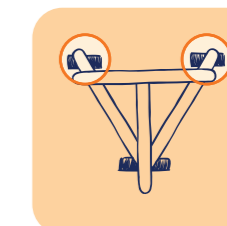


- Waiho te kāpia kia mārō, ka haere tonu ai

Hei mahi 2: Tāpiria ngā paewīra



- Tapahia tētahi wāhanga o tētahi ngongo, kia 5 mitarau te rahi, ā, whakapiria ki te kāpia ki te pūtake o te "V", ki te wāhanga e hono ai ngā taha e rua



- Tapahia ētahi wāhanga o tētahi ngongo, kia 2.5 mitarau te rahi, ā, whakapiria ki ngā taha e rua o te tihi o te "V"



Te whakamātau kapohau nunui

Kia tīmata i te titiro ki te kaha o tō kapongao anahe.

Honoa tō kapohau ki te papa tāhiko kua oti te tā (PCB), ā, waiho ki mua i te kōkōhau.

Karakarahia ngā rama i kā mai i tō kapohau i tōna kotahi.



Rama tuatahi:
te pūrāma



Rama tuarua:
te rorohiko



Rama tuatoru:
te kāinga



Rama tuawhā:
te marae



Rama tuarima:
te kura



Rama tuano:
te whare taonga



Rama tuawhitu:
te whare pukapuka



Rama tuawaru:
te hōhipera



Rama tuaiwa:
te tāone katoa



Papa hiko kōmaru

Whakamahia ai ētahi puna pūngao whakahou maha hei whakahiko i te hapori. Mā te pēnei e kā tonu ai ngā rama, ahakoa te huarere!

Tāpirihia tētahi papa hiko kōmaru me kore noa e kā mai te tāone katoa.

Me whakamahi ia rōpū i tō akomanga i taua puna aho tonu, ā, me rite hoki te tawhiti kia tika ai ngā putanga.



Inea te tawhiti o te haere o ia waka ki te rūri

Ingoa o te rōpū	Te tawhiti o te haere (mitarau)	Ngā kitenga

He aha ngā whakawhitinga pūngao e puta mai ana?

Whakakīia ngā āputa ki ngā tūmomo pūngao.

Pūngao oro

Pūngao neke

Pūngao kūtotororo

Pūngao pōkākā

Te hererapa kua torohia:

Te waka i tukua:

 + +

He aha ngā āhuatanga i tawhiti ake ai, i tere ake ai rānei te haere o tō waka?

Ngohe 2.1: Ngā tāhiko pepa

Ka taea e koe te hanga tētahi tāhiko māmā hei whakakā i ngā rama? He māmā noa iho!

Hangaiia tētahi ara e neke ai ngā ia hiko i te puna hiko e whakaputa ana i te hiko, ki te kawenga e whakamahi ana i te hiko.

Hangaia tō tāhiko

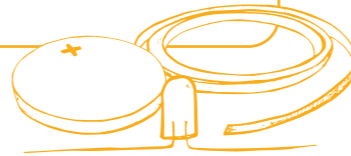
Hātepe 1

Tāia tētahi ara i te whakaahua ka timata i te pito A, ka hono ki te tohu LED, ka mutu ki te pito B.



You only need three basic things:

- Coin battery (the generator)
- Copper tape (the conductive path)
- LED (the load)



Hātepe 2

Ūhia te ara nāu i tā ki te tēpa konukura. Waiho tētahi āputa i te wāhi kei reira te tohu LED.

Kia hanga koe i ngā kokonga i tō tāhiko, kaua e kuti i te tēpa konukura! Kāore te wāhi hāpiapia o raro o te tēpa e kawea iahiko, nō reira ka whati te tāhiko. Me whakapiko kē kia kokonga te āhua.



Hātepe 3

Whakapikohia ngā wae o te LED kia papatahi ai. Tāpirihia te LED ki tō tāhiko, ki runga tonu o te tohu LED.

He wae tōrunga, he wae tōraro anō hoki o tō LED. Me hono koe i te wae tōrunga o tō LED (ko te wae roa ake) ki te taha tōrunga o tō tāhiko, ā, me hono te wae tōraro (ko te wae poto ake) ki te taha tōraro o tō tāhiko.



I mōhio rānei koe?

Ko te pūkawe te ingoa o ngā rawa kawea hiko, ā, ko te ārai te ingoa o ngā rawa kāore e kawea hiko.

Hātepe 4

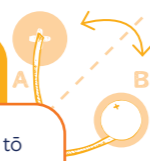
Waiho te pūhiko ki te pito B, ki runga i te tēpa konukura.

He taha tōrunga, he taha tōraro anō hoki o te pūhiko. He tohu tāpiri kei te taha tōrunga. Waiho te pūhiko ki te tāhiko, ā, me aro te taha tōraro ki raro.



Hātepe 5

Whētuaia te kokonga o tō whārangi kia pā ai te tēpa konukura kei te pito A (ko te taha tōrunga o te tāhiko) ki te taha tōrunga o te pūhiko.



I kā rānei i a koe ngā rama?

Kāore i kā mai? E pai ana! Tirohia mēnā kei te tika te takoto o te LED me te pūhiko, kia rere ai tāhiko mai i te tōrunga ki te tōraro.



Ngohe 6.1: Whakakāngia te tāone

He karanga tēnei ki ngā ihumanea PŪRAU - he karanga tēnei nā tō tāone!

Kia mahi ngātahi koutou hei rōpū ki te whakakā i te tāone katoa ki ngā rongoā pūngao whakahou.

Pātai: Ka pēhea te pānga o ngā hoahoa whakapai ake ki te mahi a te kapohau?

Tā mātou whakapae:

Ki a mātou, ka pēnei te āhua o te pānga o ngā hoahoa whakapai ake ki te mahi a te kapohau:

E pēnei ana ō mātou whakaaro i te mea:

Ngohe 5.1: Whakapai ake

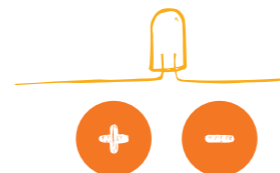
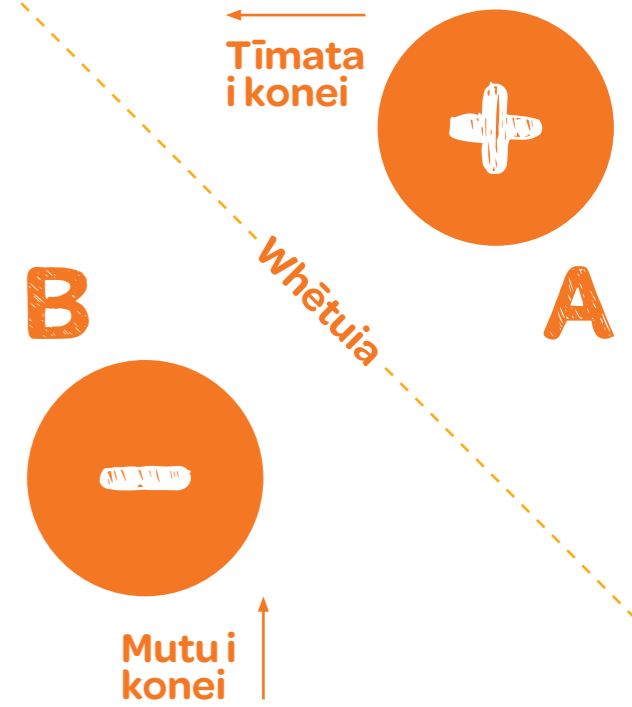
I te wāhanga ki te whakapai ake, ka mahi tahi ngā ihumanea PŪRAU ki te whakatika i te kapohau kia tino pai rawa atu.

Whakaūngia ngā akoranga katoa kua mau i te roanga o te wero, kātahi ka tuhituhi iho i ētahi mea hei whakapai māu, ā, me pēhea hoki te whakapai i aua mea rā.



Ko tā mātou i ako ai mō te huringa hiko:	Ko tā mātou i ako ai mō te koutatanga:	Ngā akoranga mō te tōpana whakahuri:	Ko tā mātou i ako ai mō ngā taurangi hoahoa ā-rapa:
Ka whakamahia ēnei mōhiohio hei whakapai ake i te kapohau mā te:	Ka whakamahia ēnei mōhiohio hei whakapai ake i te kapohau mā te:	Ka whakamahia ēnei mōhiohio hei whakapai ake i te kapohau mā te:	Ka whakamahia ēnei mōhiohio hei whakapai ake i te kapohau mā te:

Now you can create your improved design and finalise your supercharged turbines!



Ngohe 2.2: Tauwhaiwhai Puna Pūngao

Haere ki waho whakamātautau ai i ō mōhiotanga ki te whānuitanga o ngā puna pūngao whakahou o Aotearoa!

Kia rite ki te tauwhaiwhai!

Hātepe 1

Kōwhiria kia toru ngā pūngao whakahou, kia toru hoki ngā pūngao whatungarongaro ka whakamahia i Aotearoa.

Hātepe 2

Whakakīia ngā pouaka ki tētahi onā puna pūngao, kātahi ka tapatapahia.

Hātepe 3

Ināianei, kei ia rōpū ōna ake puna pūngao e ono.

Me whai koe:

- i tētahi wāhi nui i waho
- i ētahi ipu e 2 i ia rōpū – whaitohua tētahi ko whakahou, ko tērā atu, ko whatungarongaro
- i ētahi kutikuti

Puna pūngao tuatahi:

Puna pūngao tuarua:

Puna pūngao tuatoru:

Puna pūngao tuawhā:

Puna pūngao tuarima:

Puna pūngao tuaono:

Kua rite koutou?

Hātepe 4

I tō rōpū, hoatu tētahi puna pūngao ki ia tangata.

Me nui atu pea i te kotahi puna pūngao ka hoatu ki ētahi tāngata.

Hātepe 5

Whakarārangi ā-rōpū i te rārangi tīmatanga. Mēnā he nui atu i te kotahi puna pūngao kei ētahi, me tū ērā ki mua o te rārangi.

Hātepe 6

Mā tētahi o te rōpū e waiho ngā ipu e rua kua whaitohungia kia 10 mita atu i te rārangi tīmatanga.

Hātepe 7

Kia karangahia e tō kaiako, "Kōkiri!", ka tahuri ia rōpū:

- ki te oma ki āna ipu
- ki te tuku i ana puna pūngao ki te ipu e tika ana (whakahou, whatungarongaro rānei)
- ki te oma atu anō ki te rārangi tīmatanga

Ko te rōpū ka oti wawe katoa i a rātou te tuku i ana puna pūngao ki ngā ipu e tika ana ngā toa puna pūngao!

Tātaritanga

He aha ngā wāhanga i mahi pai i ō whakamātautau?

He aha ngā āhuetanga kāore i pai? Me pēhea tō whakapai ake i tō hoahoa?

Does this result match with your conjecture? Why/why not?

Pātai: Ka pēhea te pānga o te hoahoa ā-rapa ki te mahi a te kapohau?

Tā mātou whakapae:

Ki a mātou, ka whakakā te kapohau i ngā rama

Honoa ia kapohau ki te PCB mā te tuku i te taura hono o te pūkaha o te kapohau ki te urunga hau o te PCB.

Kia rite tonu te tere me te tawhiti o te kōkōhau i ia whakamātau, ā, ko tāu he mātai noa iho i te pānga o tētahi taurangi kotahi, arā, ko te hoahoa ā-rapa.

E whakaaro pēnei ana mātou, i te mea:

Tuhia ngā putanga o te akomanga i te hopunga whakamātau.

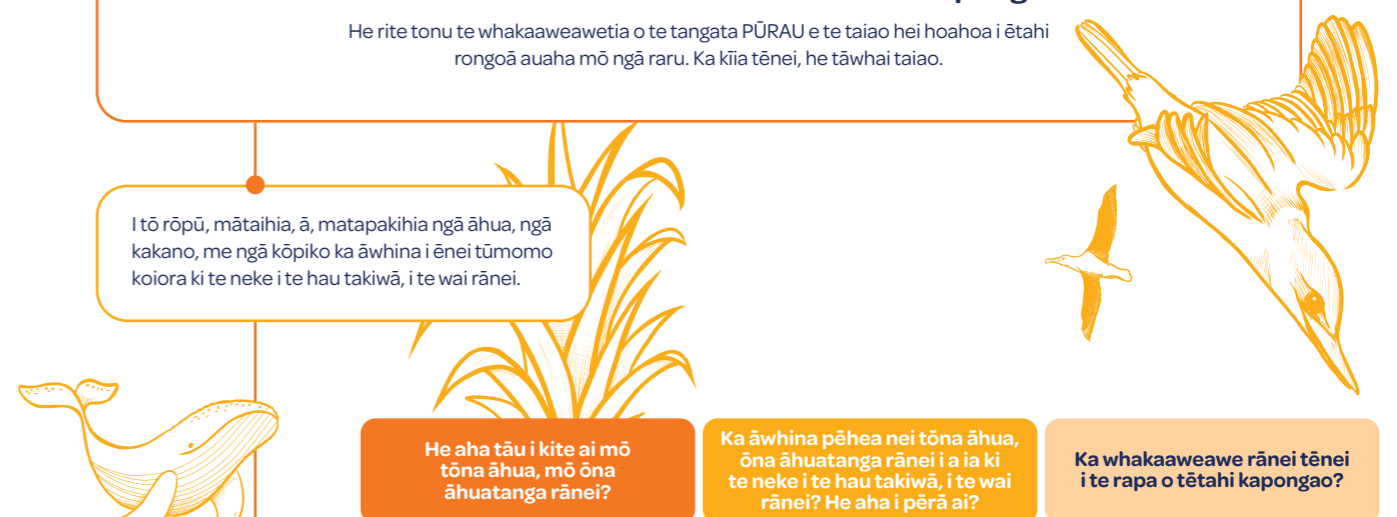
Hopunga whakamātau			
Ingoa ā-rōpū	Hoahoa ā-rapa	Te whakapae i mua atu	Ngā kitenga i muri mai
Turitea	Āhua: Koru Rahi: 15x3 mitarau Tau: 4 Ngā rawa: Pepa	Te nui o ngā rama: 2 Ko te take: He ngāwari rawa te rawa mō te rapa.	Te nui o ngā rama: 0 Ko te take: I pīngore te pepa i te hau. Kāore te kapohau i huri.
		Te nui o ngā rama: Ko te take:	Te nui o ngā rama: Ko te take:
		Te nui o ngā rama: Ko te take:	Te nui o ngā rama: Ko te take:
		Te nui o ngā rama: Ko te take:	Te nui o ngā rama: Ko te take:
		Te nui o ngā rama: Ko te take:	Te nui o ngā rama: Ko te take:

Ngohe 3:1: Kia māori te koutatanga

Tūhuratia ngā tūmomo āhuratanga koutata katoa kei te taiao hei whakaaweawe i tō hoahoa i tō kapongao.

He rite tonu te whakaaweawetia o te tangata PŪRAU e te taiao hei hoahoa i ētahi rongoā auaha mō ngā raru. Ka kīia tēnei, he tāwhai taiao.

I tō rōpū, mātaihia, ā, matapakihia ngā āhua, ngā kakano, me ngā kōpiko ka āwhina i ēnei tūmomo koiora ki te neke i te hau takiwā, i te wai rānei.



		He aha tāu i kite ai mō tōna āhua, mō ōna āhuratanga rānei?	Ka āwhina pēhea nei tōna āhua, ōna āhuratanga rānei i a ia ki te neke i te hau takiwā, i te wai rānei? He aha i pērā ai?	Ka whakaaweawe rānei tēnei i te rapa o tētahi kapongao?
Toroa				
Kōtare				
Harakeke				
Paikea				

Ngā kōrero

Ko ēhea āhua, āhuatanga rānei e koutata katoa ana? He aha ai?

Ko ēhea āhua, āhuatanga rānei e whakaaweawe ana i tō hoahoa i te rapa kapongao?

Ngohe 4.3: Whakamātautau

Whakahaerehia he whakamātautau kia kite ai koe mēnā ka nui rawa te hiko e whakaputaina ana e ō kapongao hei whakakā i tō tāone.

Kia rua ngā whakamātautau hei mahi māu. I ia whakamātautau, mātaihia ngā mahi, ā, tuhia iho tāu i kite ai. Mā tēnei e pai ai tō whakapai ake i tō kapongao ā muri ake nei.

Whakamātau 1: Ngā āheinga o te tauirā whakamātau

Ka oti i ngā kaipūhanga ētahi whakamātau i ngā āheinga kia kitea ai mēnā e tika ana te mahi - mā te pēnei e kitea ai ngā raru!

Tukua kia rere!

Āta panaia ngā rapa.

He aha tāu e kite nā?

E taurite ana te noho o ngā rapa? E hurihuri ana? E hūkokikoki ana rānei?



Kāore i te huri.

Kia kotahi te panonitanga hei mahi māu. Tuhia ngā kitenga i raro iho nei.

E huri ana.

Ka rawe! Kia whakakā koe i tō tauirā whakamātau.

Whakamātau 2: Whakahikotia tō tauirā whakamātau

Mā tō whakamātautau tuarua e mōhio ai koe ki te āhua o tā te hoahoa rapa pā ki te mahi a te kapongao.

**I tēnei whakamātau,
me whai koe:**

- i tētahi papa tāhiko kua tāia (PCB)
- i tētahi kōkōhiko (ka pai te kōkōhiko ā-tēpu e 40 mitarau te rahi)

Ngohe 4.2: Waihanga

Hangaia te taura whakamātau o tō kapohau!

Mātakina te ataata 'waihanga', ka whakamahi ai i ēnei tohutohu ki te whakaora mai i tāu i hoahoa ai.

Hangaia tō kapohau!

Hātepe 1

Hangaia ō rapa ki ngā rawa i kōwhiria ai mā te whakamahi i tō hoahoa mai i te Ngohe 3.2.

Hātepe 2

Tāpiria he whakanikoniko ki te mata o ō rapa.

Hātepe 3

Tāpirihia ō rapa ki ētahi rākau ahiparaka ki te kāpia. Me tatari kia maroke rā anō te kāpia.

Me whai koe i ēnei mea:

Kei tō kete hiko

- He pūtake
- He tia rākau (tia hono)
- He hanganga ahu-rotu kua tāia hei uhi-pūkaha
- He pūkaha
- He pūtake rapa
- He rākau ahiparaka
- He peru me tētahi tiwiri

Me whai hoki koe i ētahi rawa tukurua hei hanga i ō rapa kapohau, me ētahi whakanikoniko hei whakarākei.

Hei āwhina i a koe! Mā te whakamahi i ētahi rawa kē hei hanga i ō rapa e puta mai ai ētahi hua rerekē. Kia āta kōwhiri koe.

Hātepe 4

Titia te pito o tō tia rākau ki te puare kei te pūtake o tō kapohau.

Wiriwirihia kia tino pūmau ai.

Hātepe 5

Hangaia te uhi-pūkaha. Waiho te pūkaha ki roto i te uhi-pūkaha, ā, tukua te taura hono o te pūkaha mā te puare kei raro o te uhi-pūkaha.

Hātepe 6

Whakanōhia te uhi-pūkaha ki runga i te tia rākau, nekehia kia tika ai te teitei, ā, kōwirihihia kia ita mā te whakamahi i te peru me te tiwiri.

Hātepe 7

Kuhuna ngā rapa ki ngā kapiti kei te pūtake-rapa.

Whakaarohia te tawhiti o tētahi i tētahi!

Hātepe 8

Tāpiria te pūtake-rapa ki te tāpine pūkaha.

**Kua oti i a koe tētahi kapohau pai te hanga!
Ka rawe tō mahi!**

Ngohe 3.2: Te hoahoa rapa

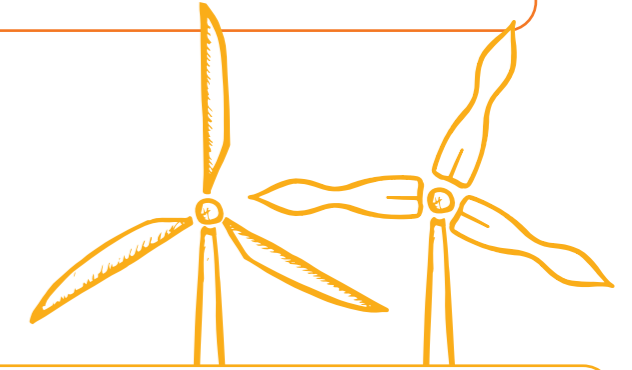
Pohewatia, ā, whakamaheretia ētahi hoahoa rapa koutata hei āwhina i a koe ki te whakatutuki i ō whāinga mō te wero.

Tāia ētahi hoahoa rapa 2D, 3D hoki, mā te whakamahi i tāu i ako ai mō te koutatanga i te taiao.

Hei āwhina i a koe! Whakaarotia ko ēhea āhuatanga, āhua hoki ka whakakaha ake i te tōpana, ka whakaheke hoki i te tōpana ātete.

Pohewa

He whakaaro mō te hoahoa ā-rapa:



Whakamahere

Ko tēhea ara te ara pai katoa?

Whakatauhia te hoahoa ā-rapa hei whai māu. Tāia ki te tukutuku, ā, kia rite te rahi me te āhua ki te rahi me te āhua tūturu o ngā rapa. Me whakamahi pea he rūri hei whakaū i ngā inenga.

Te hoahoa ā-rapa whakamutunga:

He aha ngā āhuatanga koutata kua whamahia e koe i tō hoahoa i tō rapa?

Me whai koe i ēhea rawa hei waihanga i tō rapa?

Ngohe 4.1: Te tauwhaiwhai pūnaha ā-hiko

Ka tauwhaiwhai koutou ko ō hoa ako ki te hono i ngā wāhanga o te ara haere o te hiko i te Pūnaha Hiko ā-Motu!

Ko tā te Pūnaha Hiko ā-Motu, he neke haere i te hiko e hia rau kiromita i te motu kia pūmau ai, kia tae haumarau ai hoki te hiko ki a tātou.

Ko te wero kei a koe, me hangā te ara haere o te hiko ki tō kāinga, ā, me tere ake koe i ētahi atu rōpū i tō akomanga. Kia tere tonu tā koutou ko tō rōpū mahi tahī ki te whakatika i te raupapa o ngā hātepe mā te whakamahi i ngā kāri kei tō kete hiko.



**Kua rite?
Kia mau,
kōkiri!**

Hātepe 1

Tikina tētahi kāri hiko.



Hātepe 2

Kimihia ētahi hoa ako e rite nei ā kōrua kāri, ā, ko koutou hei rōpū.



Hātepe 3

Matapakihia e koutou ko tō rōpū ngā mea kei ā koutou kāri.



Hātepe 4

Tīmata i te kāri 'whakatōhī', atu i tērā, haere whakamuri ki te whakatika i te raupapa o ā koutou kāri, kia tere te mahi.

Hei wero anō, me whakamātau ki te whakatika i te raupapa me te kore e pānui i muri o ngā kāri!



Hātepe 5

Kia tika i a koutou te raupapa, whakatūria ngā ringa.



Kia kaha rā!

