

YEARS 5-8

# Hei whakaratatia te hiko a Tāwhirimātea



He mātauranga rauemi e pāhekoheko ana i waenganui te hunga Kenehi me te Rōpū Emirates o Aotearoa.

Ka mahi ngātahi te hunga Kenehi me te Rōpū Emirates o Aotearoa hei whakarato i ngā rauemi mō ngā marautanga Pūtaiao, Hangarau, Mātai Pūhanga me te Pāngarau ki ngā kura i te tau toru tekau mā ono te āhuareka mō te Ipu o Amerika. Ko ngā kaiwhakahaere e rua mō tā rātou auahatanga taurira whakamāramatanga. Ko te whāinga a tēnei mahi hei whakaohoho i tētahi reanga hou a ngā kaimātai pūtaiao, ngā kaumoana, ngā kaiauaha me ngā kaipūkaha hoki.

## TIROHANGA WHĀNUI

Uiuitia kia pēhea te whītiki te mauri me te kaha o Tāwhirimātea. Whakatauiria mai he waka moana kua waihangatia e taea ana te hau pupuhi te mau i te ihi hei whakaangi.

# NGĀ HONO Ā-MARAUTANGA: TE MARAUTANGA O AOTEAROA

NGĀ WĀHANGA AKO:

NGĀ WHĀINGA PAETAETAE:

NGĀ  
TAUMATA:

NGĀ  
TAU:

Pūtaiao:  
Ō Ahupūngao  
Te Tōpana me te Nekenga

Ka mārama haere ki te tōpana me te nekenga, me te ako i ngā pūngao me ngā pāhekoheko e hāngai ana. Ka tūhura, ka whakamahi i te tauira pūtaiao hei whakaatu i te tōpana me te nekenga, me ētahi whakamahinga, pēnei i te mānu, te pana me te tō.

3-4

5-8

Ngā Momo Tūhuratanga

Ka oti te whakarōpū me te tautohu, te torotoro, te rapu tauira me te whakatauirā, te whakamātau tika, te whakaoti rapanga, te hanga i tētahi mea, i tētahi pūnaha rānei.

Hangarau:  
Te Whakaharatau Hangarau  
Te Hoahoa mō te  
Whakaharatau

Ka whakamātau, ka aromātai i te hoahoa. Ka kōwhiritia tētahi huarahi kia tika rawa. Ka whakamahia he mahere, ka whakamātauria kia kitea: te whanaketanga; te tōtika o te mahi. Ka whakahiatotia ngā pūkenga ā-ringa, ā-hinengaro, taha auaha anō hoki. Ka whakamātauria te hua i runga anō i te āhua o te hiahia me te urupare a ngā kiritaki. Ka mārama ki te whakahaere o ngā pūnaha hangarau.

3-4

5-8

# Ko ngā kaimahi o te Rōpū Emirates o Aotearoa me te hunga Kenehi

E tū whakahīhi ana te Rōpū Emirates o Aotearoa rāua ko Kenehi ka mahi ngātahi ngā tāngata e ngākau kaha kei ōna kare ā-roto mō ngā marautanga Pūtaiao, Hangarau, Mātai Pūhanga me te Pāngarau, ā, ka whakaratatia te hau i ngā pēwhetanga whānui. Ānei ngā tauira e rua.



**Craig Brown**

Ngā Kaiwhakahaere Paenga o Te Whakatakoto Punahiko o Tongariro me te pāmu hau ā Hau Nui.



**Elise Beavis**

Kaipūkaha Āheitanga Te Rōpū Emirates o Aotearoa

## He aha ngā taha o tāu mahi?

Ko tāku mahi i te pāmu pūrere kapohau e hāngai ana ki ngā rautaki āhei ana te haumāiuiui kia mau ki ōna taumata pūhiko nā Tāwhirimātea atua o ngā hau e whā e whakarawe. Ko te mea tino motuhake i tāku mahi hei hangāia he wāhi haumarua hei tiakina te taiao mā ngā kaimahi hangarau e mahi ana ki ngā pūrere kapohau.

## He aha tāu mātau ā-wheako mō ngā marautanga Pūtaiao, Hangarau, Mātai Pūhanga me te Pāngarau?

Ko tōku mana hei kaiwhakahaere mō te taiao, he tohu tāku i roto i nga mahere ako mō te taiao. Ko tōku waimarie e mahi ana hei kaimahi ki Kenehi i ngā wāhanga tokomaha, ā, kua whanaketia noatia ōku pūkenga ki ngā kainga hira.

## Me aro ngā rangatahi Māori ki ngā marautanga Pūtaiao, Hangarau, Mātai Pūhanga me te Pāngarau?

Ā pāia! Ka mau ngā pūkenga āhei ana ahakoa kei hea koe, te tokomaha o ngā kaimahi kua ākona i ngā mātauranga Pūtaiao, Hangarau, Mātai Pūhanga me te Pāngarau, ā, ka whakamahi rātou i ngā momo umanga whakaehu rerekē. Ko ngā mātauranga Pūtaiao, Hangarau, Mātai Pūhanga me te Pāngarau he kaupapa kua whāngaia he āhuatanga hoahoa motuhake, mō ngā ahumahi whānui. Hei tātaritanga, hei whakawhiti kōrero, ā tuhinga-kōrero, hei wheriko i roto i ngā tūmomo umanga rerekē.

## He aha ngā taha o tāu mahi?

E arotake ana ahau ki ngā mahi hangarau hei whakahohoro i te waka moana hei ahu whakamaui. Nā te lpu o Amerika tētahi wero nui mōku ki te whakaoti pēhea te ō pai noa te waka moana, hei whakarawe i ō mātou wakarererangi kei haere wharau ki Bermuda - he mea tino whēuaua tēnā!

## He aha tāu mātau ā-wheako mō ngā marautanga Pūtaiao, Hangarau, Mātai Pūhanga me te Pāngarau?

I roto pai au he tohu mātauranga pūkaha i Te Whare Wānanga o Tāmaki Makaurau. Ko tētahi arotakenga i reira ko Te Whika o te Wē Taineke, ā, kua whakawhanaketia tāku tino mahi ki te Rōpū Emirates o Aotearoa. Waimarie anō, e taea ana ahau te rangahau ētahi mahi i whakaturea i tōku tohu mātauranga, ā, nō te mahi nei i kuhu ahau ki roto i te reanga mahi nei.

## Me aro ngā rangatahi Māori ki ngā marautanga Pūtaiao, Hangarau, Mātai Pūhanga me te Pāngarau?

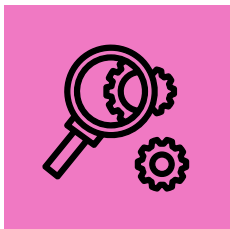
Koia pū! He hēramana whiwhita ahau, ā, e tino whakapau kaha ki ngā mahi mātai ahupūngao, ki ngā mahi pāngarau hoki, kua whakahaere ahau kia hono āku remurere umanga hei moemoea mō te ahumahi. He hinengaro māhirahira tōku, ā, e hiahia tonu ana au kia mōhio me pēhea te whakamahia te ao katoa, ā, ina koia nei tōu karanga ko te mātauranga Pūtaiao, Hangarau, Mātai Pūhanga me te Pāngarau te kaupapa e whai ake.

# He mōhiohio ā-kaiako

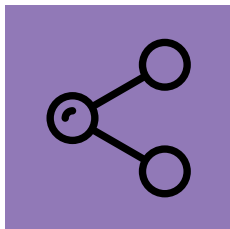
## Ngā hātepe ako



Whakatōhia te mātauranga



Hōparatia he uiuinga



Hangaia me te tohaina



Hurihuringa me te whakahorapatia



Waihangatia ngā rerekētanga

## Ngā hua akoranga

*E ako ana ngā taurira ki te:*

- whakatewhatewha i te pūngao nekehanga o te hau ka taea e ngā kōmaru me ngā pūrere hiko te whakarawe i te ihi.
- whakatauirā mai he whakamātautau me te mātaitanga ki te rangahautia i ō rātou hoahoa waka moana e whakamau hiko mai i te hau.
- whakamārama mai me pēhea te ihi o Tāwhirimātea ka taea te whakarata hei hiko te waka moana te Rōpu Emirates o Aotearoa.

## Pearu angitu

*Ka taea ngā taurira:*

- whakatau he kaupapa mahi mā tētahi waka moana iti e whakahikotia ake e te hau.
- whakamāramahia ko te pūngao e whitiwhiti ana i te waka moana i te hau pupuhi.
- whakamāramahia ko te pūngao o te hau me te pūngao hei korikori te waka moana hei tūmomo pūngao neke.

## Ngā rauemi matea

Ngā rauemi hei whakahoahoa, hei whaihanga i tētahi waka moana nā te hau hei hiko; hei taurira: ngā pepa, ngā tēpa whakapiri, ngā ngongoa, ngā papanga, ngā mahi toi, ngā rango roa hōpua, ngā paipa kirīna, ngā kinipepa, nga pātara kirihou, nga pōwaiwai, ā, ngā taonga hangarua hoki.

## Ngā kupu hou:

pūngao moe, pūngao neke, whakarata, tōpana, rewa, totohu, pūrewa, katote.

## Ngā mōhiohio tāpiripiri me ngā rauemi taituarā

Te pae tukutuku matua a te Rōpū Emirates o Aotearoa:

<https://emirates-team-new-zealand.americascup.com>

Emirates Team New Zealand: The day we won the America's Cup back:

<https://www.youtube.com/watch?v=bUOE6gSAjVY>

Genesis: Powering Emirates Team New Zealand:

<https://www.youtube.com/watch?v=HRky1vc5zUo>

Genesis teacher's resource and [PowerPoint Wind power and Turbines \(level 1 and 2\)](#)

Ministry of Education (2004). Windmills and Waterwheels: Harnessing the Energy of Wind and Water. Building Science Concepts Book 54. Wellington: Learning Media.

Ministry of Education (2004). Floating and Sinking – How objects behave in Water, Building Science Concepts Book 37. Wellington: Learning Media.

# Ngā whakaaranga wheako ako

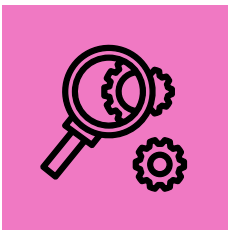
Arohia: Ko ngā whakaaranga anake ēnei, ā, hei akiaki ngā kaiako te whakarite i te mahi nei kia koi mō ngā manea me ngā aronga ā rātou taurira.



## 1. Whakatōhia te mātauranga

Whakatakinga:

- Wānangahia ngā ariā mō te pūrewa me te totohu. Kōwhiria ngā mea hei whakaehu ki te taupunga wai. Hei taurira: te pepa, te rākau, te kirihou, te konganuku, me te huarākau. Ka pēhea nga taurira e whakatātare hei hanga pūrongo kia rewa me te totohu, he aha ngā mea e taea ana whakatātare mā te rewa me te totohu?
- Whakatātare mai he whakamāramatanga o ngā ariā waiwai mō te pūrewa me te totohu. Hei taurira: ka rewa he taonga e tārore ana i te hau ana ka āngi te taonga, ā, ko te taonga māmā mō tōna hanga hei ine ki te wai, ā, e āhei ana te rewa i te wai.
- Tirohia ki te whakaaturanga kiriata mō te pūngao hau hei ako anō mō te pūngao moe, te pūngao neke me kia pēhea te whītiki te mauri me te kaha o Tāwhirimātea e whakamahi ana ngā kōmaru me ngā kapohau. Tirohia: <http://bit.ly/2VhtL4W>



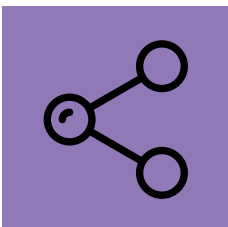
## 2. Hōparatia he uiuinga

He mahi āhua 20 meneti

Whakaarohia kia pēnā i tētahi kaipūtaiao



- » Wānangatia: He aha te hau? Kia pēhea te hau e neke? Kua noho koe i waho i ngā wā tūpararā? Ka pēhea ngā taonga taputapu pātata ana kia koe i ngā rangi hūkerikeri?
  - Ka pēhea te hau e āwhinatia i a tātou? Nā te hau e tiakina i a tātou te hunga ora kia hihiko i ngā tūmomo taonga pēnei nā i ngā motokā, ngā waka rererangi, ngā poti, te aha atu rānei.
  - Hurahurhia ki te ipurangi, ā, uiuitia ngā whakataetae o te Ipu o Amerika i ngā wā o mua.
  - Mātakitakina ngā whakaata mō ngā whakataetae o te Ipu o Amerika ki TiriAta, ā, tirohia te ariā waka AC75. Hei taurira: [https://emirates-team-new-zealand.americascup.com/en/gallery/296\\_AC75-BOAT-CONCEPT.html](https://emirates-team-new-zealand.americascup.com/en/gallery/296_AC75-BOAT-CONCEPT.html). Mātakitakina kia pēhea te waka moana e whakamahi ana te pūngao hau.
- » Wānangatia: He aha matea ai ngā kōmaru, ā, kei te aha āna mahi? He aha te āhua o te kōmaru, hoki he aha ngā auaha i pērā? Ka pēhea te taunga o ngā kōmaru i te waka e pā ana te tere? Ka pēhea te waka moana e haere mā runga te moana?



## 3. Hangaia me te tohaina

He mahi āhua 45 meneti

Whakaahuatia tētahi waka moana e taea te rewa mā te pūngao hau hei whakaangi ki mua (mā kotahi, mā rōpū rānei).

**Hangaia tētahi waka moana e whakahikotia i te hau.**

Ka taea te hau te whakararata i te takawairore waka moana kia pānekeneke i te wai. Ko tōu ake whakaahuahanga o te waka moana he taurira ngāwari e kore e rite ana ki ngā hohoutanga me nga pīroiroi mō ngā whakataetae ao moana, engari ka whakamahi e te hau hei tō i te waka ōrite ana ki ngā waka moana o te Ipu o Amerika.

He maha ngā whakaaro i TiriAta kia whakaohohotia i a koe, hei taurira: <https://www.youtube.com/watch?v=AMKTrwxroTY>



## 1. Whakaahuatia tōu waka moana

- Tirohia ki ngā tauira o ngā waka moana, whakatauirā mai ngātahi me tō rōpū he aha ngā āhuatanga o tō koutou waka moana.
- Whakatatūria ngā rauemi ka whakamahia tō koutou rōpū.
- **Hangaia tētahi mahere ako, tuhituhia, tapaia tētahi āhuatanga waka moana kia whakamārama te āhua me ngā rauemi kua whakamahia**
- Ngā rauemi āhei ana te whakamahi: ngā pepa, ngā tēpa whakapiri, ngā ngongoam, ngā papanga, ngā mahi toi, ngā paoka, ngā rango roa hōpua, ngā paipa kirīna, ngā kinipepa, nga pātara kirihou, nga pōwaiwai, ā, ngā taonga hangarua hoki.



## 2. Whaihangaia tōu waka moana

- Whaihangaia tō koutou waka moana mai ō koutou mahere me ngā rauemi kua whakamahia hoki mo te tauira hei whakaatu. Use your plan to make your model sailboat.
- Whakamahia tō koutou mahere kia hanga tō koutou waka moana.



## 3. Whakamātautauria tōu waka moana

- Whakamātauhia tō koutou waka moana i te wai. Ka rewa? Ka noho matika i te hau?
- Me matea koutou te whakapai hapa i tō koutou āhuatanga whakaritenga, i tō waka moana kia rewa ake, kia whakaneke ake hoki? Wānangahia, ā rōpū anō he āhuatanga whakapai hoki ngā rauemi kia whakarite ngā mea e hiahia nei.
- **Wā whakataetae, inea te wā o tō koutou waka moana:** whakamahia he wāhi puna kauhoe rānei kei tētahi ngao, inea te wā o te waka moana ā whakatetae mai!
- Hopukina he whakatūranga mai tētahi kāmera i tō koutou waka moana i terea ana i waenganui i te whakataetae.



## 4. Te hurihuringa me hei whakapai ake hoki

- Kua angitu tō koutou waka moana? He aha ai? He aha kē ai?
- Whakaarohia kia pēhea koutou e whakapai rapanga kua whakapuaki.
- Whakaaturia i pēhea tō koutou waka moana te whakarata te pūngao neke a te hau o Tāwhirimātea.
- Hoki whakamuri hei whakapaia tā koutou āhuatanga whakaritenga.
- Huria tō koutou tauira, ā, whakamātautauhia anō.



## 4. Hurihuringa me te whakahorapatia

He mahi āhua 10-20 meneti

Whakatōmene te inenga mā ngā tauira waka moana.

Waihangatia he rapanga pāngarau mō ngā āhuatanga waka moana kua hanga me ngā tauira whakamātautau waka moana, mō ngā whakataetae o te Ipu o Amerika.

- Inea te tawhititanga o tō koutou waka moana.
- Tatauhia te roanga, te whārahi, me te teitei hoki o tō koutou waka moana.
- Inea te roa o tō koutou waka moana kua haere i te tohu A ki te tohu B.
- Whakamahia tētahi huahuatanga kia whakaaturia te tawhiti o te waka moana i waenganui i ō koutou akomanga.
- Whakamahia te torohanga taumata 4-5: “[E tātai ana te ihi o Tāwhirimātea,](#)” whakamāramahia me pēhea te pūngao hau e pā ana ki ngā waka moana o te Ipu o Amerika.

### Hurihuria

- Whakamahia tētahi mahere ako ki te hurihuria kia angitu tō koutou āhuatanga waka moana, i pēhea hoki ā koutou mahi. Āheitia kia whai wā mā ngā tauira kia rātou mahi, kia pēhea te whakahaere i haere i a rātou mahi hoki. Tātaitanga: 1 = Kāore i te pai, 2 = Kia kaha, 3 = Pai ake, 4 = Hurō. Whakamahia tenei [whārangi mahi](#) mōu hei hurihuria ō koutou tautōhito me ngā pukapuka tatau kua whakaritea koutou.

### Whakatauiratia nei ngā tuhituhi, me ōu mahere ako hoki:

- I waituhia au i tōku āhuatanga, ā, i whakanikoniko hei mārara ngā āhua, me ngā rauemi kua whakamahia.
- Kua hangaia ahau i tētahi waka moana e whakamahia ana ōku whakaaro, ōku rauemi hoki.
- Kua whakapai ake ahau i tōku waka moana whai muri tāku aromatawai.
- E taea ana tōku waka moana te rewa, ā, i hihiko te kaha o te hau kei runga ake i te moana.



## 5. Waihangatia ngā rerekētanga

He mahi āhua 15 meneti

- Whakatūtirahia ngā rauemi katoa kua whakamahia hei whakarākei ake i ngā tauira waka moana. He aha ngā rauemi kua mauria mai? He aha ngā rauemi kua hangaruahia rānei ngā rauemi nā Tāne Mahuta i horahia? He

aha ngā huanga i whakamahia mō ngā rauemi hangaruatia hei hangaia taonga? He aha ngā kōwhiringa i tino toitū?

- Whakarārangitia kia pēhea e pupuri i ngā arawai kua whakapai tātou.



### Whakahiko ā-Tāngata

Ka āhei ngā kura i te Punahiko ā-Tāngata a Te Kura Whakatipu o Kenehi (e whakaatuhia ki mauī). Ka āwhina ngā tauira te ako i ngā mahi pūngao. Ka taea e te pūrere iti nei te whakahiko ngā tamariki e whakamahi ana ō rātou kaha ā-ringa. He ōrite te huri a te tauru i tētahi waka moana.

Tirohia: <http://schoolgen.co.nz/teach-and-learn/humanenergygenerator/> mō ngā mōhiohio tāpiri.