



He Kai Kei Aku Ringa



He Kōpaki Hangarau - Taumata 1

He rauemi hei ako i te Hangarau i te taumata 6 o
Te Marautanga o Aotearoa, i te taumata 1 hoki o NCEA.

He Mihi

He mihi tēnei ki a koutou, e ngā ākonga, e hāpai ana i te reo rangatira. Tēnā koutou katoa.
Kei roto i tēnei huinga rauemi tētahi kōpae ataata, tētahi kōpae hikohiko, ngā pukapuka e rima mā ngā ākonga, me tētahi pukapuka hei āwhina i ngā pouako rātou ko ngā ākonga e whai ana i te ara hangarau.

He mihi tēnei ki ērā mātanga hangarau katoa nā rātou i whai wā ki te āwhina, ki te tautoko i a mātou i te hanganga o tēnei rauemi. Kua aro hoki mātou ki ētahi pepa kua whakaputaina e Te Tāhuhu o te Mātauranga hei āwhina, hei tautoko i ngā kura, i ngā kaiako ki te whakaako i te marautanga hangarau. Ka taea e te katoa te aro atu ki ēnei pepa kei te Ipurangi kei te paetukutuku *Techlink*.
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He Kōpaki Hangarau Taumata 1

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I hangaia tēnei rauemi hei tautoko i
Te Marautanga o Aotearoa



He Kai Kei Aku Ringa

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Te Whakamahi i

Tēnei Rauemi

Te whāinga

Māu tēnei pukapuka, arā, mā ngā ākonga e whai ana i te Hangarau i tētahi akoranga o te taumata 6 o te wāhanga ako hangarau o *Te Marautanga o Aotearoa*. Ko te nuinga o ēnei ākonga kei te tau 11, engari kua te katoa.

Koinei tētahi o ngā pukapuka e rima mā ngā ākonga, he kōpae ataata, he kōpae hikohiko anō e haere ana i te taha. Kia noho tēnei hei tūāpapa mō ētahi akoranga hangarau kotahi tau te roa.

Anei ngā ingoa o ngā pukapuka:

1. Te Whare Tautaiāo, Tū Ana, Tau Ana
2. He Taonga Tonu te Rāpihi
3. Nō Hea Koe, Ko Wai Koe?
4. **He Kai Kei Aku Ringa**
5. Te Kaha o te Hau

Ko te ingoa o te kōpae ataata, ko He Kōpaki Hangarau Taumata 1. E rima ngā mātaitanga e whakaataria ana ki te kōpae, ko tētahi mō tēnā, mō tēnā o ngā pukapuka e rima.

E whakamahia ana te kupu mātaitanga i konei hei whakaahua i te tirohanga hōhonu ki tētahi āhuatanga koia e whakaahua ana, e whakatauiria ana i tētahi kaupapa whānui e arotahia ana.

Mā te kaiako koe e ārahi ki te āta wherawhera i te pukapuka nei me te kōpae ataata.

He maha ngā wāhanga o te pukapuka. Ka whakamāramatia takitahitia tēnā me tēnā:

- Te Mātaitanga
- Te Marautanga o Aotearoa
- Te Whakawhanaketanga o te Otinga Hangarau
- Te Anga Whakaū Māramatanga ki te Tukanga Hangarau
- Te Whakaharatau Hangarau
- Ngā Āhuatanga Hangarau
- Te Aromatawai

Te mātaitanga

Kua tū mai te mātaitanga kia kite ai, kia whāwhā ai koe, te ākonga, i ētahi tauria tūturu o ngā whakaharatau hangarau – o neherā, o nāianeī anō hoki. Ka whakaaturia ētahi āhuatanga o te tukanga hangarau i roto i ngā mahi whakaharatau hangarau o te mātaitanga. Nā te āhua tonu o te whakaharatau hangarau, kāore tonu pea koe e whai wā, e whai rānei i ngā rawa e taea ai ēnei mahi te kawhe ake i te kura. Engari mā te mātaitanga ka kite wheako koe i ngā mahi e mahia ana, me ētahi mahi iti ake e āhua rite ana ka taea te kawhe i te kura.

E hāngai pū ana te mātaītanga i tēnei pukapuka ki ngā kōrero o te mātaītanga i te kōpae ataata, engari he paku rerekē ngā kōrero.

Ka kapi i ia mātaītanga tētahi, ētahi rānei o ngā Aho (ngā wāhanga hangarau) e rārangi iho nei:

- Hangarau Koiora
- Te Tuku Mōhiotanga
- Ngā Hanga me ngā Pūhanga Manawa
- Te Tāhiko me te Hangarau Whakatinā
- Hangarau Kai

He anga e mārama ai te tukanga hangarau

Ko te anga nei hei arataki i a kōrua ko te kaiako, kia mārama ai kōrua ki te tukanga hangarau. E whakaahua ana te anga i ngā takahanga katoa o te tukanga hangarau, e whakaatu ana anō hoki i ētahi tauira o ēnei kei roto i te mātaītanga.

Kei te whārangi 12 tētahi hoahoa e whakaatu ana i ngā wāhanga katoa o te tukanga hangarau, ā, ko ēhea wāhanga ka taka ki raro i Ngā Āhuatanga Matua o te Hangarau, ko ēhea wāhanga kei Te Whakaharatau Hangarau.

I ngā whārangi 13–28 e āta whakamāramatia ana ngā tauira o roto mai i te mātaītanga e hāngai ana ki tēnā takahanga, ki tēnā takahanga o te tukanga hangarau.

Ā te mutunga o ngā wāhanga “Te Whakaharatau Hangarau” me “Ngā Āhuatanga Hangarau”, tirohia anō te hoahoa kei whārangi 12. Tāruatia te hoahoa kātahi ka tohu mai mēnā kua kitea e koe he tauira o ia wāhanga mai i te mātaītanga. Mēnā āe, e tohu ana tēnei kua mau i a koe ētahi mōhiotanga ki ngā takahanga katoa o te tukanga hangarau.

Te aromatawai – he aromatawai i te tukanga hangarau me te whakamahi anō i ngā paerewa paetae

Ko tā tēnei wāhanga, he āta whakaatu me pēhea te whakamahi i ngā whāinga paetae hei aromatawai i te mōhiotanga o te ākonganga ki ētahi āhuatanga o te tukanga hangarau. Kei konei anō tētahi tauaromahi me ōna anō kupu whakamārama, e hāngai ana ki tētahi whāinga paetae. E whakaahuatia ana ngā paeāru, kua takoto anō he whakamārama mō ngā mahi kia mahia, e kīia ai āe, kua tutuki te whāinga.

Ko te tukanga hangarau e arotahia ana i tēnei wāhanga, ko tērā kei te mātaītanga. E whakamahia ana i konei kia āta kite ai koe ka pēhea tō aromatawainga tūturu.

Te Mātaītanga – He Kai Kei Aku Ringa

E tipu, e rea,
Mō ngā rā o tōu ao;
Ko tō ringa ki ngā rākau a te Pākehā
Hei ara mō tō tinana,
Ko tō ngākau ki ngā taonga a ō tīpuna Māori
Hei tikitiki mō tō māhunga,
Ā, ko tō wairua ki te Atua,
Nāna nei ngā mea katoa.

I ngā wā o mua he iwi hauora te iwi Māori. Ko te kaha pāria e ngā mate pērā i te mate pukupuku, i te mate manawa, kāore i kitea i mua. He iwi kaha ki te tiaki i te tinana, nā te uru ki te hākinakina, nā te roa o ngā haere mā raro, nā te mahi i ia rā, i ia rā, nā te tika anō o ngā kai. Ka mutu, karekau ētahi kāore i taea e rātou ā rātou tamariki te whāngai. Ka toko ake te pātai, he aha i pā ai ēnei tūmomo mate ki a tātou i ēnei rā? Arā te whakautu, nā te tini whanaketanga hangarau i te taenga mai o tauīwi me ā rātou āhuatanga katoa.

Heoi anō, e tika ana kia anga whakamuri tātou ki ngā rā o mua me te āta titiro ki ngā mahi a rātou mā. He aha ā rātou kai? He aha ā rātou inu? He aha ngā painga kei ngā tūmomo kai?

Kua ahu mai te nuinga o ngā mate o tēnei wā i te urunga o ngā parakino pērā i ngā tāroki ki ngā kai me ngā inu. I inumia e ngā tūpuna te wai māori, arā, te wai o ngā awa, he wai ora. I kaingia e rātou ngā kai o te ngahere, o te moana, o ngā māra Māori, karekau he tāroki i reira. Karekau i ruia he patu otaota ki te whenua. Ā, ko te mea ka whakatipuria hei kai, ka noho tonu hei kai. Kāore ngā kai o aua wā i rāwekeweketia – he kūmara te kūmara, he taewa te taewa!

I roto i ngā kai o aua wā te oranga mō te iwi. He pūmua kei ngā ika, he huaora kei ngā huawhenua, ā, he warowaihā kei te kūmara. He reka te tāwara o te katoa!

I ēnei wā, e tūhuratia ana ētahi o aua kai e ngā kaipūtaiao me ngā kairangahau, kia mōhio ai rātou ki ngā painga me ngā āhuatanga katoa o aua kai. Ko te kūmara me te taewa ētahi o ngā kai kei mua i te aroaro i tēnei wā. He aha i pēnei ai?

E ai ki te kōrero, i tae mai te kūmara mā runga i ngā waka o Aotea, o Kurahaupō, me ētahi anō pea o ngā waka, i te nui ake i te 1 000 tau i mua. He rerekē te āhua o te kūmara i taua wā, ā, he pakupaku noa. Ahakoa i whakatipuria huri noa i te motu, ko Te Taitokerau me Te Tai Rāwhiti ngā takiwā pai rawa atu. Nā te pai o te oneone me te mahana o te huarere, ka huhua te kūmara.

I waenga i te tau 1850 me te 1855 i tae mai he momo anō i Amerika, he nui ake, he reka ake. Kua hīkaka mai ngā iwi ki te whakatipu i taua momo hou. Mai i taua wā ka whanake ētahi atu momo kūmara.

Ko te tūmomo kūmara kei ngā toa kai i tēnei wā kua mōhiohia ko Ōwairaka. Ko Tokatoka te kūmara āhua kōwhai te tae.

Me te taewa? Ehara tēnei i te kai tūturu o Aotearoa. E 8 000 tau ki mua, he kai tēnei nā ngā iwi o te Andes. Ka haria ki ngā whenua o te ao e ngā Pāniora. Ko te taewa tuatahi e mōhiohia nei ko te “pāpā”, nō Peru.

I tere tonu te tahuri a ngā tūpuna ki te whakatipu i tēnei huawhenua, nā te mea he māmā ake te whakatipu, te tiaki, te hauhake hoki. Kua huhua noa ngā momo taewa i ēnei wā. Ruarua noa iho ngā wā me ngā wāhi e kitea ai ngā taewa tawhito.

Ngā painga o te kūmara

Ko tēnei huawhenua tētahi o ngā kai e tino āwhina ana i te hauora o te tangata. Kī ana te kūmara i te huaora me te *taiora*. Kāore he hinu, he ngakototo rānei. Kāore e kore, he oranga kei te kūmara mō ngā tūpuna. Nā reira e tika ana kia kaingia tonutia te kūmara e te iwi Māori i ēnei rā.

E tūhuratia ana e ētahi tāngata ngā huarahi ohaoha e wātea ana i te kūmara. Mai rā anō kua mōhiohia he kai Māori te kūmara, engari kua eke pea ki te wā ki te whakamōhio atu i ōna painga ki te ao whānui. Engari ko te riro o ngā kai Māori pēnei i te kūmara hei rawa ohaoha tētahi take e tautohea ana e ētahi.

Ko ētahi kai anō kua pērāhia ko ngā tāwara o te ngahere, arā, ko te kawakawa, te mānuka, te pōhutukawa, te kōwhai, me te horopito. Ā, ka whakamahia hei rongoā waihanga, hei rongoā Māori, hei kīnaki, hei waipiro hoki.

E kī ana ētahi me noho tonu ēnei hei kai Māori. Ki ētahi atu he huarahi wātea tēnei e whairawa ai te iwi. Heoi anō, ehara ko te iwi Māori anake ngā kaiwhakatipu kūmara, ngā kaihanga waipiro, ngā tāngata hoko ki tai rānei.

**Rangahaua, tūhuratia ngā tukanga whakatipu kūmara.
He rerekē ngā taumata kounga mō ngā kūmara e hokona ana.
He aha ngā paearu mō te hoko ki tai? Ka pēhea mō te hoko
ki roto tonu o Aotearoa?**

E tika ana anō kia hokona tēnei kai tūturu a te Māori ki tai? Mehemea ka pērāhia, he aha ngā tikanga, ngā ture rānei e tika ana kia whāia mō te āhua o te whakatipu, e hāpaitia ai ngā whakaaro o te iwi Māori?



Te Tāhuri Whenua

Ko Tāhuri Whenua tētahi rōpū e tautoko ana i ngā kaiwhakatipu huawhenua Māori. E tū ana anō rātou hei kanohi Māori i roto i te ao ahuwahenua. Anei ā rātou whāinga:

- kia tū tētahi rōpū hei whai wāhi atu ki te ahumahi, ki te hāpai i ngā tikanga Māori, i te mātauranga Māori, me ētahi atu āhuatanga o te ao Māori.
- kia takoto tētahi wāhi, tētahi kaupapa e hui tahi ai ērā o te iwi e ngākaunui ana ki te whenua me te whakatipu hua whenua, e pai ai te tautoko tahi, te ako tahi, tētahi i tētahi.
- ki te āwhina i ngā whakatipuranga o muri ki te whiri hononga anō ki te whenua mā roto i ngā mahi whakatipu kai.
- ki te whakatū i tētahi rōpū ā-motu ka taea e ia te hoko, te tohatoha rangahautanga, kaupapa whakapakari ki te iwi Māori mā te iwi Māori.
- kia takoto he rautaki e whai ana kia wātea ake ngā ara e uru ai te Māori ki ngā mahi whakatipu hua whenua, kia kaha ake anō hoki te tautoko o te Māori i roto i ēnei mahi.

He rerekē te tae, te āhua, me te tawara o ngā momo kūmara



[Ko ngā whāinga nei he mea whakamāori mai i *Tāhuri Whenua: National Māori Vegetable Growers Collective: Management Plan Summary Document whārangi 1.*]

Kimihia he kōrero mō tēnei rōpū i te paetukutuku. He aha te ngako o ā rātou mahi? Me pēhea rātou e āwhina ai i ngā kaiwhakatipu Māori?



Te taewa

He kairangahau a Nick Roskruge, he kaiahuwhenua, he kaiako hoki. Kei Te Whare Wānanga o Massey ia e mahi ana. Ko tētahi o āna mahi i tēnei wā, ko te āta titiro ki te āhua o te taewa tawhito, ā, me pēhea te whakahoki i tēnei taonga ki ngā iwi. Ko ia hoki tētahi o ngā kaiwhakahaere o te rōpū Te Tāhuri Whenua.

Ka tautoko te rōpū nei i ngā tāngata katoa e hiahia ana ki te whakatipu i ngā taewa tawhito. He maha ngā momo taewa, engari ko te mea pai ki te nuinga ko te hua karoro.

He aha i pai ai tēnei momo taewa ki te nuinga? Whakaarohia te āhua, te *kakano*, te *tāwara*, me ētahi atu āhuatanga.

Ko ētahi atu tūmomo taewa ko te tūtaekurī, te wherowhero, te pāwhero, te karupārera hoki. Heoi anō, he nui noa atu ngā momo. He rerekē ngā ingoa ki ētahi iwi.

I ngā wā o mua i whakatipu huawhenua ngā whānau katoa, nā te mea e noho tawhiti ana i te tāone, me te māmā anō o te utu. Engari ko te take matua, he pānga anō i waenganui i te tangata me te whenua. I whai oranga te tangata i tōna whenua. Nā konei i puta ai te kōrero, “He kai kei aku ringaringa.”

He aha te take kāore te nuinga o ngāi tāua e hiahia ana ki te whakatipu taewa, kūmara, hua whenua i nāianei? Whakaritea he rārangi wā kia kitea ai ngā whanaketanga me ngā rerekētanga i te āhua o te whakatipu kai i te takanga o te wā. He aha ngā awe kua pā ki te tangata?



Ko tā Nick mahi, he whakamōhio atu ki ngā hapū me ngā iwi me pēhea te whakatipu tika i te taewa kia whai hua ai. Ka mahi ia i runga i te tono mai a ngā marae, ngā hapū, ngā iwi rānei. He aha a Nick me ērā atu o Te Tāhuri Whenua i hiahia ai ki te whakaora i te taewa tawhito?

Nā te hangarau kua rerekē ngā tukanga whakatipu, whakatō, hauhake hoki. Engari nā te hangarau kua rerekē anō ko te taewa tonu. He rerekē te āhua o te taewa o ēnei rā i ngā taewa i whakatipuria e ngā mātua tūpuna. Engari he uri tonu.

Tūhuratia ngā rerekētanga me ngā take i pērā ai. Whakaarohia ngā matea o te kiritaki i tēnei wā.

Kei te whenua o Peter Richardson ētahi taewa e whakatipuria ana. Nō Ngāti Apa a Peter. Kua tautokohia e Nick mā. Ko te pai o ēnei whenua, nō Peter ake, kāre



he utu rīhi. Ka hiahia a Peter mā ki te whakatipu taewa hei kai, hei oranga mō te whānau. Ka nui hoki te taewa mā tōna marae, a Parewahawaha.

Hei te wā o te whakatō, o te hauhake hoki, ka tae atu te hāpori ki te āwhina. Ka oti ngā mahi, ka kai!



Engari, hei te mutunga o te mahi ka whakahokia ētahi taewa ki te whenua, hei kai mā te whānau!

He Kupu Taka

hauhake	<i>harvest</i>
hiahia/matea	<i>need</i>
hoko ki tai	<i>export</i>
huaora	<i>vitamin</i>
kakano	<i>texture</i>
matea/hiahia	<i>need</i>
ngakototo	<i>cholesterol</i>
parakino	<i>pollutant</i>

patu otaota	<i>pesticide</i>
pūmua	<i>protein</i>
rāwekeweke	<i>manipulate</i>
rīhi	<i>rent</i>
tāroki	<i>preservative</i>
tāwara	<i>taste</i>
warowaihā	<i>carbohydrate</i>

Te Marautanga o Aotearoa

I ahu mai ēnei kōrero i Te Marautanga o Aotearoa

Ko te iho o te hangarau kei te waiata e whai ake nei. Mai i te whakaharatau hangarau a ō tātou tūpuna tae noa ki ngā tukanga hangarau o te ao hurihuri, i whakatakotohia e ō tātou tūpuna he huarahi hei whāinga mā tātou.

Tikina atu i tua whakarere
I te ao kōhatu
Ngā mōhiotanga o rātou mā
Hei kawē i a tātou i roto i te ao tūroa
Kua takoto kē te whāriki i rarangahia e rātou
Wānangahia, tuakina kia tau
Rangahaua kia maumahara
Manakohia kia whiwhi ai
Te mātauranga Māori motuhake

Kia tipu ake te kākano hangarau ki ā tātou ākonga, me whakawhiti kōrero, me raweke, me whakamātau kia mau tonu.

Te whaitake o te ako i te hangarau

Me whaitake ngā kaupapa hangarau kia kore ai e whāia mō te kore noa iho.

Mā te hangarau ka tū rangatira ngā ākonga. Hei whakahiato i ngā mōhiotanga hangarau, ka tīmata i te ao Māori me tōna hāngai ki te ao hurihuri. Me aro anō ki ngā uara, ngā pūkenga, me ngā mōhiotanga hangarau o te ao e taunga ana ia.

Te hanga o tēnei wāhanga ako

E rua ngā whenu, ko Ngā Āhuetanga o te Hangarau me Te Whakaharatau Hangarau. Kātahi ka taka mai ki ngā aho hangarau e rima. Ko te Hangarau Koiora, Te Tuku Mōhiotanga, ko Ngā Hanga me ngā Pūhanga Manawa, ko Te Tāhiko me te Hangarau Whakatika, me te Hangarau Kai.

E tika ana kia tūhuratia ngā āhuetanga o ngā momo matū kei ia kaupapa hangarau. Ā, he wāhi anō mō te āta whakaaro ki te taha hātepe me te taha whakanao. Kei roto aua wāhanga i te mahere hoahoa a te ākonga.

He rerekē ngā mōhiotanga kei ia whenu. Me hono ngā whenu e rua ki ngā aho kua kōwhiritia hei tūāpapa mō te mahi hangarau. Mai i te kaupapa whānui ka taka iho ngā aho hei āwhina. Tērā pea e rua, e toru rānei ngā aho e hāngai ana. Me hāngai te aromatawai ki ngā whāinga kei ngā whenu.



Ngā āhuatanga o te hangarau

Ka whakaahuatia te whakaharatau hangarau e:

- ngā tāngata me ō rātou āhuatanga katoa;
- ngā hiahia me ngā huarahi wātea o te ao whānui.

Ka rangahau, ka tūhura ngā ākonga kia mārama ai rātou ki ngā uara me ngā whakapono o te tangata, kia mārama anō ki te pāpātanga o aua āhuatanga ki te whakahiato hangarau.

Ka mōhio ki te tiaki whenua, ki te tiaki taiao, me te pāhekotanga i waenganui i te whakaharatau hangarau me te haporī. Ko te ira atua, ko te ira tangata e noho ngātahi nei te tangata me te whenua.

Me whakaaro ki ngā mahi toitū a ngā tūpuna tae noa mai ki tēnei wā. Me āta titiro ki te pānga o te otinga hangarau ki a Papatūānuku rāua ko Ranginui.

Toitū te whenua, whatungarongaro te tangata. Toitū te whenua, toiora te tangata.

Te whakaharatau hangarau

I roto i tēnei whenu ka pakari haere ngā mōhiotanga me ngā pūkenga hangarau. Ko te whakaharatau hangarau te tōpūtanga o ngā mōhiotanga me ngā pūkenga e puta ai he otinga.

Ētahi pūkenga hangarau:

- te whakaraupapa i ngā mahi hei hātepe;
- te tautohu i ngā hiahia me ngā huarahi wātea hei painga mō te tangata;
- te arotake i ngā hātepe me te otinga i runga i te aro nui ki te take;
- te tīpako me te whakamahi i ngā mātāpono hangarau;
- ngā pūkenga ā-ringa, ngā pūkenga auaha e puta ai he otinga.

Ētahi mōhiotanga hangarau:

- ngā mahi hangarau a ngā tūpuna tae noa ki ēnei wā;
- te āheinga ki te whakatutuki i tētahi hiahia i runga i te tika;
- kia mārama ngā ākonga ki ngā hapori, ki ngā ahurea me ngā tāngata taketake;
- kia mārama ngā ākonga ki ngā mātāpono hangarau me te tika o te whakamahi.

Ngā Aho	Hei whakamārama
Hangarau Koiora	Ko tā te hangarau koiora, he whakamahi i ngā pūnaha whai oranga hei raweke i ngā tukanga māori, hei painga mō te tangata. Tērā pea ko te whakatipu ā-wai, ko te rongoa, ko te tiaki rauropi rānei e tata korehāhā ana. Ka whai wāhi hoki ki te tūhura i ngā tini āhuatanga o te raweke ira.
Te Tuku Mōhihio	Ko te tuku mōhihio he whakawhiti mōhiotanga, arā te reo, me ngā toi ataata pērā i te whakairo, tae atu ki te tuhi, mā te pene, mā te rorohiko, mā te aha atu rānei. He tirohanga whakamua, whakamuri hoki.
Ngā Hanga me ngā Pūhanga Manawa	Ka tīmata te hanga ki ngā hanga māmā noa, pērā i te pouaka kawē, ka piki ake ki ngā hanga uaua, pērā i te pā tuna, i te tāwhiti kiore, i te manu aute. Ka mārama ki te hononga me te pānga i waenganui i ngā wāhanga o te hua, me te tino take o ia wāhanga.
Te Tāhiko me te Hangarau Whakatina	Ko te tāhiko te hoahoa, te hanga, me te whakanao i ngā pūnaha hiko me ngā pūrere tāhiko. Ko te hangarau whakatina te whakahaeretanga o ēnei pūnaha pūrere tāhiko.
Hangarau Kai	Ko te hangarau kai ko ngā āhuatanga katoa o te whakatipu, te hauhake, te tohu, te tunu, te rokiroki me te tākai kai. Ka tūhuratia hoki ngā āhuatanga kawekawe o ngā tūmomo kai hei whakahiato i ētahi atu kai.

Taumata 6

Ngā Āhuatanga o te Hangarau

1. Ka tirohia ngā uara me ngā whakapono o iwi kē, ka:
 - whakahāngai ki te otinga;
 - mōhio ki ngā whakaharatau;
 - whakarite ki ngā hangarau a tangata kē;
 - mārama ki ngā ārai me ngā huarahi wātea ka taea.
2. Ka tūhura i ngā āhuatanga matua o te tangata e pā ana ki:
 - ngā pūnaha, ngā tukanga rānei;
 - te hiahia o ngā kiritaki;
 - ngā rautaki whakatairanga ki te kiritaki.

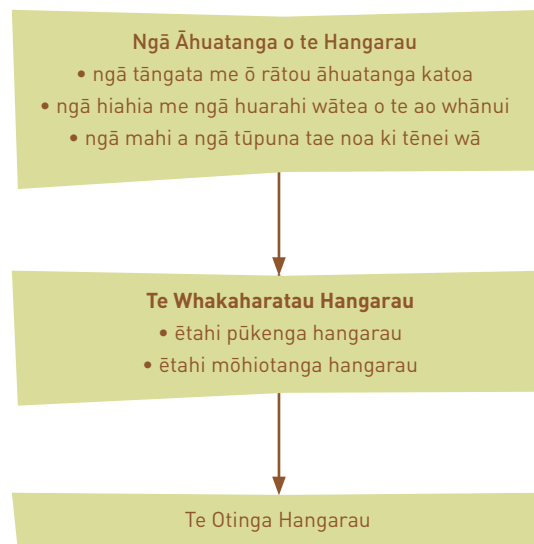
Te Whakaharatau Hangarau

3. Ka arohaehae i ngā whakatakotoranga hoahoa whaiaro, ā ētahi atu hoki, hei āwhina.
4. Ka whakamātautau i ngā raraunga me ngā mōhiotanga hou kia puta ai he otinga tika.

Te Whakawhanaketanga o te Otinga Hangarau

E whakarāpopoto ana te hoahoa i raro nei i te ara e puta ake ai he otinga hangarau. Heoi, ehara i te mea ka āta whāia tēnei raupapa i ngā wā katoa; ka āhua haere kōtuitū kē te mārama haere ki ngā āhuatanga o te hangarau me te whakaharatau hangarau, e puta ai te otinga hangarau ā tōna wā.

Te whakawhanaketanga o te otinga hangarau

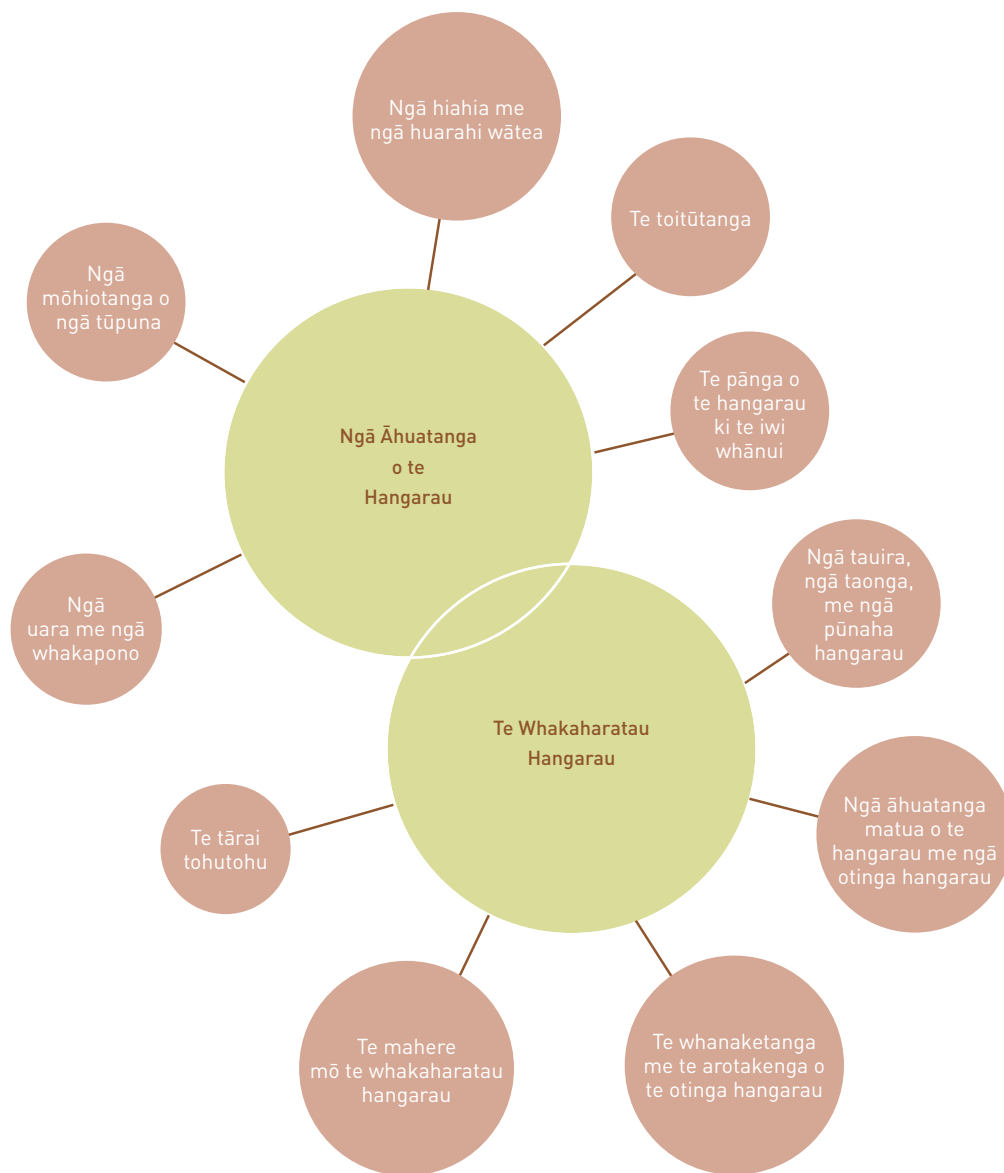


Kei te whakaatu tēnei tauira o te whakawhanaketanga otinga i te tukanga hangarau e puta ai he otinga hangarau. E whakaataria ana anō hoki tēnei i te anga e whai ake nei.



Te Anga Whakaū Māramatanga ki te Tukanga Hangarau

Ngā āhuatanga māramatanga ki te tukanga hangarau



He Kupu Taka

āhuatanga hangarau	<i>technological characteristic/feature</i>	ngā tauira, ngā taonga, me ngā pūnaha hangarau	<i>technological models, products, and systems</i>
āhuatanga māramatanga ki te tukanga hangarau	<i>characteristics/features for understanding the technological process</i>	otinga hangarau	<i>technological outcome</i>
āhuatanga matua	<i>key characteristic/feature</i>	pānga ki te iwi	<i>impact on society</i>
arotakenga	<i>evaluation</i>	tārai tohutohu	<i>brief development</i>
hiahia me ngā huarahi wātea	<i>needs and opportunities</i>	toitūtanga	<i>sustainability</i>
mahere	<i>plan</i>	uara	<i>values</i>
mōhiotanga o ngā tūpuna	<i>knowledge tūpuna have</i>	whakaharatau hangarau	<i>technological practice</i>
		whakapono	<i>beliefs</i>
		whanaketanga	<i>development</i>



Te Whakaharatau Hangarau

Te tārai tohutohu

Ka whakatakotoria he tohutohu hei āta whakaahua ā-kupu i te otinga e wawatatia ana kia puta hei whakatutuki i tētahi hiahia, i tētahi huarahi kua wātea, i tētahi take rānei. Mā ngā tohutohu e āta whakaatu ngā mahi kia mahia, ā, he aha te take me mahi aua mahi. Ka tuhia ngā tohutohu hei whakapuakitanga huatau.

I roto i ngā tohutohu, me mātua tautohu:

- te otinga e tūmanakotia ana kia puta;
- te hiahia, te huarahi rānei e wātea ana;
- he whakapuakitanga huatau;
- ngā whakatakotoranga whāiti;
- te taiao tūturu me te taiao pāpori;
- te arotakenga a ngā hunga whai pānga mai.

Āta whakaarohia tāu i pānui ai i tēnei pukapuka me tāu i kite ai i te kōpae ataata mō ngā kai a ngā tūpuna. Mā te whakautu i ētahi o ngā pātai e rārangi iho nei, ka āwhinatia koe ki te whai whakaaro ki ngā tohutohu tērā pea i whakatakotoria mō te whakatipu i ngā kai tūturu a te Māori.

He aha te otinga e tūmanakotia ana kia puta ki a tātou, te iwi Māori?

- Ki te whakatipu tātou i ngā kai kua whakatipuria e te Māori mai rā anō, ko tātou anō te hunga whai pānga mai?
- Ko wai mā ētahi atu hunga whai pānga mai?
- Me whai whakaaro ki te rōpū Te Tāhuri Whenua, tae atu ki te ringa ahuhenua, a Nick Roskrige. He aha ngā otinga kia puta i tautohua e rātou?

He aha ōu hiahia, he aha anō ngā hiahia o ētahi atu tāngata whai pānga mai? (Me āta tautohu ēnei mō roto i ngā tohutohu.)

- Me pēhea e mōhio ai ngā kaitārai tohutohu ki ēnei hiahia?

Ki ō whakaaro, he aha ngā huarahi wātea e whāia ana e Te Tāhuri Whenua me Nick Roskrige i roto i ā rātou mahi?

Ka pēhea te āhua o te whakapuakitanga huatau mō ngā tohutohu e pā ana ki te whakatipu kai kia rite ki tā nga tūpuna i whakatipu ai? Whakaarohia ngā mahi kia mahia, me ngā take i pērā ai te āhua.

He aha ētahi o ngā whakatakotoranga whāiti e hāngai ana ki tēnei mātaitanga?

- Ka rerekē ēnei i ērā i kōrerotia mō ērā atu kaupapa o te kōpaki nei?
- Hei tauira, ka hāngai pea ngā whakatakotoranga whāiti ki te momo oneone, me ngā momo matū e pai ai tētahi momo oneone hei whakatipu kai.
- Me pēhea e mōhio ai ngā kaitārai tohutohu ki ēnei whakatakotoranga?

Mō te wāhi ki te taiao tūturu, ki te ao tūroa, he aha ētahi mea me mātua whiriwhiri mō te whakatipu kai?

- Kei te wātea he pito whenua rahi hei whakatipu i ngā kai?
- E hono tahi ana te wāhi kei reira te whenua me ngā hunga whai pānga mai?
- Ka pēhea ngā tāngata noho ki te tāone nui? He huarahi anō e wātea ana hei takahi mā rātou?

Arā anō te taiao pāpori, e whai wāhi mai ai ngā take matatika, ngā take tōrangapū, ngā take ahurea, me ngā take ohaoa.

- Me pēhea e mōhio ai te kaitārai tohutohu ki ēnei ahuatanga, e pai ai tana whakauru ki ngā tohutohu?
- He aha te pānga o te ōhanga ki te mahinga mai o ngā pito whenua hei māra kai?
- Ka pēheatia mēnā e mate ana te ōhanga?
- Ka puta he hua ki te hapori ina mahia he māra? Hua pēhea nei?

He Kupu Taka

arotakenga	<i>evaluation</i>	tautohu	<i>identify</i>
hunga whai pānga mai	<i>stakeholders</i>	te hiahia, te huarahi rānei e wātea ana	<i>need or opportunity</i>
otinga e tūmanakotia ana kia puta	<i>desired outcome</i>	tohutohu	<i>brief</i>
taiao pāpori	<i>social environment</i>	whakapuakitanga huatau	<i>conceptual statement</i>
taiao tūturu	<i>physical environment</i>	whakatakotoranga whāiti	<i>specification</i>

Te mahere mō te whakaharatau hangarau

Ina whakapaua he kaha kia whaihua tonu te mahere, ka pai noa ake te whakaharatau hangarau. Ko te mahere, ko te āta whakariterite i a koe mō te wāhi ki ngā mahi kei mua i a koe. Ko te whakamahere i runga i te whaihua, ko te āta whakatina i ngā rauemi (pērā i ngā rawa, i te wā, me ngā tāngata) kia tino puta ai ngā painga.

Hei wāhanga o te mahere, ka whakahuatia ētahi putanga matua kia ea i te ekenga o ia wāhanga matua o te kaupapa, āhea, ā, ka pēhea te whakamahi i ngā rauemi e ea ai aua putanga.

Arā ētahi momo āwhina ka kīia he “taputapu” mahere, koia ētahi ko: te ohia manomano, te mahere hinengaro, te tahua whakaaro, te hautaka huritao, te pukapuka kohinga kuha, te mahere whakatutuki, te tūtohi Gantt, te hoahoa ripo, te kaitātai ataata, tae atu ki ētahi tikanga whakakaupapa, tikanga hoahoa. Heoi anō, ko te taputapu e kōwhiria, ko tērā e rite ana, e hāngai pū ana ki te mahi.

Mā te whakamahi taputapu mahere, ka taea te anga whakamuri ki ngā mahi kua mahia kētia, ka whakahāngai ai ki tāu e mahi ana i nāianei, me ngā rā kei mua i te aroaro. Ko te tātari hoki tētahi wāhanga nui o ngā mahi whakariterite. Kia rite tonu te āta tirotiro i ō mahi, kia mōhio ai koe āe, e whaihua ana, pēhea kē rānei.

He mea nui anō kia tāwariwari te mahere, engari kia pakari tonu te hanga. Ko te mahere tāwariwari, ko te mahere e taea ana te kuhu atu ētahi whakarerekētanga ki roto, nā runga anō i ngā mahi arotake i te pai, i te whaihua o ngā mahi e kawea ana.

Ko te mahere pakari, ko te mahere ka tū tonu, ka haere tonu ina kuhuna atu ēnei whakarerekētanga.



Āta whakaarohia te wāhi ki ō tātou tūpuna me ā rātou whakariterite e rawaka ai te kai mā te whānau, mā te hapū, mā te iwi.

- He aha ngā momo kaupapa i tahuri ai rātou ki te whakatipu i te kūmara me te rīwai, mai i te whai kia ora noa ngā puku o te whānau, ki te hora hākari mā te iwi i tētahi hui whakanui?
- He aha ngā taputapu mahere e tino hāngai ana ki tēnā, ki tēnā?
- He aha ngā taputapu mahere pai hei nanao mā Nick me tana rōpū i roto i ā rātou mahi?

Whakaotia te tūtohi e whai ake nei hei whakaatu i te hāngai o ia momo taputapu mahere ki tēnā, ki tēnā āhuatanga (kei te tūtohi ētahi tauira o ngā tūmomo āhuatanga e hāngai ana):

Āhuatanga	Taputapu mahere	Te hāngai pū ki te mahi kua tohua māna
Te kimi mai he aha katoa ngā hui kei mua i te aroaro		
Te kimi mai he aha ngā momo kūmara/ rīwai pai hei whakatipu i tēnā rohe, i tēnā momo oneone, i tēnā wā o te tau		
Te whakahāngai i ngā mahi kia mahia ki ngā rā me mātua oti aua mahi		

Hei āwhina i a koe ki te whakakā i tēnei pouaka, pātaihia te pātai e whai ake nei:

- He aha te take koinei te taputapu mahere pai katoa hei whakatutuki i tēnei āhuatanga?

He Kupu Taka

e hāngai pū ana ki te mahi	<i>fit for purpose</i>	ohia manomano	<i>brainstorm</i>
hautaka huritao	<i>reflective journals</i>	pukapuka kohinga kuha	<i>scrapbook</i>
hoahoa ripo	<i>flow diagram</i>	tahua whakaaro	<i>idea bank</i>
kaitātai ataata	<i>graphical organiser</i>	taputapu mahere	<i>planning tool</i>
mahere hinengaro	<i>mind map</i>	tikanga hoahoa	<i>diagramming technique</i>
mahere pakari	<i>robust plan</i>	tikanga whakakaupapa	<i>structuring technique</i>
mahere tāwariwari	<i>flexible plan</i>	tūtohi Gantt	<i>Gantt chart</i>
mahere whakatutuki	<i>plan of action</i>		

Te whanaketanga me te arotakenga o te otinga hangarau

Ko te whakamaunga atu mō te whakaharatau hangarau kia puta tētahi otinga hangarau e hāngai ana ki te mahi i whakaritea māna i te tīmatanga, arā, i roto i ngā tohutohu. Tērā pea he momo taonga tonu te otinga e taea ana te whāwhā, tērā rānei he pūnaha.

Hei whakawhanake i tētahi otinga, me hihiri ake ngā whakaaro auaha, kātahi ka whakapaipai haerehia ēnei i runga i ngā kitenga rangahau, i ngā whakamātautau, i ngā mahi tātari, i ngā mahi whakamātau papanga, tae atu ki te arotakenga i runga i ngā kōrero whāiti i tuhia ki ngā tohutohu.

Me kī ko te whakawhanake otinga me te whakaharatau ngā takahanga whakamātau, waihanga o te whakaharatau hangarau.

Tērā tonu ka puta ētahi otinga waenga i te whakawhanake haeretanga o te otinga whakamutunga. Ko tā aua otinga waenga, he tautoko i te neke whakamua o ngā mahi whakawhanake, he whakaatu rānei he pai ake kia hikina ngā mahi, kia mahia ai ētahi whakarerekētanga, me whakamutu katoa atu rānei.

He tauira ēnei e whai ake nei o ētahi otinga waenga o ngā mahi whakaharatau hangarau:

- He rangahau mēnā ka taea te mea e wawatatia ana.
- He tohutohu kua oti te tārai?
- He whakaahua hukihuki o te huatau.
- He whakaaritanga ā-rorohiko.
- He tauira pakupaku.
- He tauira taketake.

Ka pai ake ngā mahi whakawhanake otinga mēnā ka āta whakaaturia ngā whakaaro kia mārama tonu ki ngā rōpū mātāmua e whai wāhi mai ana, me te whakamahi i ngā hoahoa me ērā atu tikanga ataata hei whakawhiti whakaaro.

Tēnā, kia whāiti te titiro ki ngā mahi a Nick me tana rōpū hei whakatipu i te taewa me te kūmara.

- Ki ō whakaaro, i pēhea te whakahou haere, te whakatika haere a ngā tūpuna i ā rātou whakaritenga mō te whakatipu me te rokiroki i ēnei kai i ngā rā o mua?
- Karekau ā rātou whakaaritanga ā-rorohiko. I pēhea kē tā ngā tūpuna whakamātau i ō rātou whakaaro hou?
- Me pēhea ngā tūpuna e mōhio ai ka ea ō rātou hiahia i ā rātou whakapaunga kaha?
- Whakaahuatia mai ngā momo whakamātau tērā pea i whāia.
- I rerekē anō ō ngā tūpuna hiahia i ētahi atu whānau, i ētahi atu hapū, i ētahi atu iwi?
- Ko te otinga e kōrerotia ake nei, he taonga, he pūnaha rānei, ko ngā mea e rua rānei?

Āta whakaarohia tēnei pātai: Āe, ka taea te whāwhā ā-ringa te taewa, te kūmara, me te kānga, engari ka pēhea te huarahi e hua ake ai ēnei kai ka tahi, e pūmau ai te pai o ngā kai ka rua, hei oranga mō te whānau, te hapū, te iwi?

Tuhia he tūtohi pēnei:

Āhuatanga	He taonga, he pūnaha, ko ngā mea e rua rānei?
Te whakatipu taewa	
Te rokiroki taewa	
Te whakatipu kūmara	
Te rokiroki kūmara	
Te whakatipu kānga	
Te rokiroki kānga	

He Kupu Taka

arotakenga	<i>evaluation</i>	tohutohu kua oti te tārai	<i>formalised brief</i>
e hāngai pū ana ki te mahi	<i>fit for purpose</i>	whakaahua hukihuki o te huatau	<i>concept sketch</i>
otinga hangarau	<i>technological outcome</i>	whakaaritanga ā-rorohiko	<i>computer simulation</i>
rangahau mēnā ka taea	<i>feasibility study</i>	whakaaro auaha	<i>creative thinking</i>
takahanga whakamātau	<i>trialling</i>	whakamaunga	<i>ultimate endpoint</i>
tauira pakupaku	<i>scale model</i>	whanaketanga	<i>development</i>
tauira taketake	<i>prototype</i>		

Ngā āhuatanga matua o te hangarau me ngā otinga hangarau

Ngā āhuatanga o te hangarau

Ko te hangarau tētahi o ngā kawenga ahurei a ngāi tāua. He pānga nui whakaharahara ōna ki te ao e noho nei tātou, me te āhua tonu o tā tātou noho ki te ao. He whāinga kei te tūāpapa o ngā mahi hangarau, ā, he haere kōtui te hangarau ki ngā āhuatanga pāpori me ngā āhuatanga ahurea. Nō reira ko ngā kawenga arā, ko ngā whakaharatau hangarau, te hua o te kōkiri a te tangata i ngā hiahia me ngā koronga. Ka hua ake te otinga i te tukanga hoahoa i āta whakaarohia, i āta tāraia, kāore i pōkerekēhū noa te puta ake.

Mā te hangarau ka kaha ake te āhe i o te tangata ki te huri i ngā matū, i ngā pūngao, me ngā mōhiotanga.

He auaha tonu te āhua o te whakaaro me te mahi a te ringa hangarau. Me āta wānanga e ia ōna whakaaro tīmatanga me ōna huatau hoahoa. Me whakaaro arohaehae ki āna mahi, ka tuketuke i ngā pou aronui, ka ako mai i ngā mahi o mua, ka āta whakaaro anō ki ngā rā kei tua, i a ia e whakawhanake ana i ōna whakaaro. Ā, me whai whakaaro anō ia mēnā ka taea anō te mea e whāia ana e ia, mēnā rānei ka paingia, ka pīrangitia taua mea.

Me aro anō te ringa hangarau ki te hanga whakatau i runga i te whakaaro whaitake, i te āta wānanga. E rua ngā momo āta wānanga, ko te āta wānanga taha whakatinana, me te āta wānanga taha painga. Ko te taha whakatinana, e anga ana ki te āhua o te kawē i tētahi mahi e tutuki pai ai. Ko te taha painga, e anga ana ki tērā e tika ana, i runga i te aro nui ki ngā āhuatanga pāpori, ngā āhuatanga matatika, ngā āhuatanga ahurea. Ka arotahingia te mea e “tika” ana, e “hē” ana rānei, e “pai” ana, e “kino” ana rānei, ki te mea e “whai uara” ana, e “uara kore” ana rānei. Heoi anō, katoa ēnei kei te āhua tonu o te titiro a te tangata nāna ngā whakatau – ōna uara, ōna whakapono, ōna māramatanga, ōna mōhiotanga.

Ko tā te hangarau, he whakamahi i te mātauranga hangarau, he whakaputa anō i te mātauranga hangarau hou. Kei te rere tahi te mātauranga hangarau me te taha whakatinana, ā, ka whai mana taua mātauranga ina kawea ake e te hāpori hangarau hei whakatinana i tētahi otinga. Heoi anō, ehara i te mea ka puta he otinga hangarau i ngā whakaharatau hangarau katoa. He wā anō e whakaata kē ana te mea ka puta ake i ngā whakatau katoa i tatū taka mai ki tērā wā.

E hono tahi ana te hangarau ki ngā āhuatanga me ngā pūnaha whakaaro o roto i ngā tau, ki ngā pānga pāpori, me ngā pānga ahurea. He awe nui tō ēnei mea katoa ki ngā hangarau ka whanake ake, me te āhua tonu o te whanake ake o aua hangarau.

E tutuki pai ai te whakaharatau hangarau, me nanao atu te hinengaro ki ngā mātauranga hangarau me ngā mātauranga o kaupapa kē, pērā i te pūtaiao, i te pāngarau. Nō reira, he wā anō me mahi tahi ngā ringa hangarau ki ngā tohunga o ērā atu kaupeka mātauranga.

Ngā āhuatanga o ngā otinga hangarau

Ko te otinga hangarau, he taonga ka taea e te ringa te whāwhā, he pūnaha rānei i waihangatia mā roto i te whakaharatau hangarau hei whakatutuki i tētahi mahi, ā, ka tū mai ki tōna wāhi e tika ana. Ka arotakea i runga anō i tōna pai ki te kawē i te mahi i whakaritea māna. Ko te kōrero “ki tōna wāhi e tika ana”, e mea ana kei te whakamahia te otinga hangarau e te hāpori hangarau.

He tūātitini te hononga i waenga i ngā taonga hangarau me ngā pūnaha hangarau. Ka mutu, ko te whakatau he taonga rānei, he pūnaha rānei, kei te āhua tonu o te titiro ki taua mea. Hei tauira, ka taea te kī he pūnaha te waea pūkoro, ka taea anō te kī he taonga.

He otinga hangarau ngā mea o te ao mariko (pērā i te pūmanawa rorohiko, i te whakaahua ā-mati, i te aha atu), tae atu ki ngā hanga e taea ana te whāwhā ki te ringa (pērā i te rorohiko, i te arawhiti, i te waka, i te rongoā, i te aha atu).

He hanga “matarua” te otinga hangarau. He āhua taha ōkiko tōna, arā, ko tana hanga tonu tērā (ā-waho, ā-roto). He āhua whakatinana anō tōna, arā, ko ngā mahi ka taea e ia. Me mōhio te ringa hangarau ki ēnei mata e rua, me te hononga i waenganui, e tutuki pai ai tana whakaharatau hangarau.

Hei tārua ake i ēnei kōrero o runga ake, ka taea te whakaahua te otinga hangarau i runga i ōna āhuatanga ōkiko, i ōna āhuatanga whakatinana, otirā, me te whai whakaaro anō ki ngā āhuatanga pāpori me ngā āhuatanga nui kua pā i roto i ngā tau.

Kia whāiti anō te titiro ki ngā mahi whakatipu taewa a Nick e kitea ana i te kōpae ataata, me te āta whai whakaaro anō ki ngā āhuatanga o te hangarau kua kōrerotia i runga ake nei. Ko ngā pātai i raro nei hei ārahi i ō whiriwhiringa.

- He pānga anō ō ērā kawenga ki te āhua o tā tātou noho ki te ao, o te noho rānei a ētahi atu ki te ao?
- He tāngata tonu kei te kōkiri i te kaupapa?
- I hua ake te kaupapa i ētahi āhuatanga pāpori, i ētahi āhuatanga ahurea?
- He aha ngā hiahia me ngā minamina taha pāpori, taha ahurea, e tutuki ana i tēnei kaupapa?

Mō te taha pāpori, nā ēnei taewa kua takoto he kōwhiringa atu anō ki te porihanga mō te momo rīwai e hiahia ana tēnā tangata me tēnā ki te whakatipu, ki te kai. Taha ahurea nei, koinei tonu te taewa i whakatipuria, i kainga e ō tātou tūpuna, nō reira he tikanga ā-iwi tonu. Kei ētahi o ō tātou kuia, koroua ngā mātauranga me ngā pūkenga hei tuku ki ngā reanga o muri iho mō te whakatipu i te taewa me te kānga Māori. Me whakaaro anō ki ngā kōrero a Nick mō te rite o te whare whakamātao ki te rua.

Ko tētahi atu āhuatanga hangarau, ko te tukanga hoahoa ka āta whāia.

- Āe rānei i āta takoto i a Nick he tukanga hoahoa hei whai māna?

Whakaarohia te otinga o ana mahi – kaua ko te taewa anake, engari ko tā Nick e kōrero rā mō te kaupapa whānui o tana mahi.

- He aha ngā momo whiriwhiringa i whāia hei tīmata i ngā mahi?
 - He aha ngā momo rangahautanga i whakahaeretia e Nick?
- Wherawherahia te tūāpapa mātauranga o ngā mahi a Nick. Ko ngā mahi hoki a Nick i Te Kunenga ki Pūrehuroa hei whakapakari i te tūāpapa mātauranga, mā te āta tiroiro i ngā mātauranga me ngā pūkenga o ngā tūpuna.

He mea nui te tiroiro mēnā ka taea tētahi kaupapa, ā, mēnā ka paingia, ka pīrangitia e te iwi nui tonu.

- He pēhea te hāngai o ēnei ki ngā mahi a Nick?
- Me pēhea koe e mōhio ai mēnā ka tū tonu, ka tōtika tonu tētahi mea, ahakoa pēhea?
- Ka rite tonu te puta o te rahi o te taewa ka hiahia i te pūnaha a Nick, me te pai anō o te āhua o ngā taewa?



- Ka tika tonu te mahi a te pūnaha, ahakoa ngā āhuatanga o waho tērā ka pāpā mai? (Hei tauira, ka pēhea mēnā kua kore te iwi e pīrangi kai i ēnei tūmomo taewa? Ka taka tēnei āhuatanga ki raro i te pātai “āe rānei ka taea, ka tutuki?”).

Ko tētahi atu āhuatanga nui o te hangarau, ko te hanga whakatau i runga i te whakaaro whaitake, i te āta wānanga. Kimihia ngā wāhi i tū ai te āta wānanga taha whakatinana i roto i tēnei kaupapa. He māmā ake te whai haere i te wānanga taha whakatinana, i te mea e aro ana ki ngā pātai me pēhea e tutuki ai tētahi mea, ā, he aha i tutuki ai tētahi mea.

Mō te wāhi ki te pūnaha a Nick, i pēhea te wānanga taha whakatinana, arā, ko te whiriwhiri he pēhea te āhua o te pūnaha, he aha i tutuki ai te mahi i whakaritea māna.

He rehurehu ake te āta wānanga taha painga, i te mea ka uru mai ko ngā whakaaro o ētahi atu. Ka oti i te tangata he whakatau i runga anō i te āhua o ōna uara, ōna whakapono, ōna māramatanga, ōna mōhiotanga, ā, e kore pea tātou e mōhio pū ki ēnei āhuatanga i ētahi atu – he kokonga ngākau, he kokonga hinengaro e kore e kitea!

Ko ngā pātai i te tūtohi nei hei ārahi i a koe ki te wherawhera i te āta wānanga taha painga.

Koinei ngā momo pātai ka tirohia i raro i te wānanga taha painga

E tika ana anō kia mahia te mahi nei?	Mā tēnei pātai ka taea te parahau te hangarau i runga anō i ngā āhuatanga pāpori, ngā āhuatanga matatika, ngā āhuatanga tikanga ā-iwi.
Hei whakautu i te pātai i runga ake, me whai whakaaro anō ki ēnei pātai.	He aha tēnei mea te tika, tēnei mea te hē? He aha tēnei mea te pai, tēnei mea te kino? He aha ngā mea e whai uara ana, he aha ngā mea kāore e whai uara ana?
Ko ngā whakautu ki ēnei pātai katoa, kei te āhua tonu o te tangata, ōna uara, ōna whakapono, ōna māramatanga, ōna mōhiotanga.	

E tika ana kia taea e te otinga hangarau te mahi i whakaritea māna, i te wāhi e tika ana mōna. Kāore he take mēnā ka tika te mahi i te whare hoahoa anake, i te whare pūtaiao anake. Mō te pūnaha o Nick, me whaihua i te maha tonu o ngā rohe whakatipu kai? Ka pai noa iho rānei mēnā i tika tana mahi i Te Papaioea anake? Ahakoa he rerekē te taonga hangarau i te pūnaha hangarau, he wā anō ka haere kōtui ēnei mea e rua i te otinga hangarau kotahi. E mōhiotia ana he taonga te taewa me te kānga. Engari he pūnaha anō? Ka taea te whakaputa taonga ki te kore he pūnaha – he pūnaha kē atu anō rānei?

Āta whakaarohia ngā āhuatanga ōkiko me ngā āhuatanga whakatinana o te pūnaha. Whakaahuatia te otinga hangarau i runga anō i te āhua o ēnei āhuatanga, kātahi ka tuitui atu ki te horopaki pāpori me te horopaki aro whakamuri e hāngai ana.

Hei tauira, whāia tētahi ara whakaaro pēnei nā:

E mau mai ana ki te pūnaha whakatipu taewa a Nick ko _____ kia taea ai _____ hei whakangata i te hiahia o te hapori ki _____. Mā reira ka taea e te hapori _____.

Whakakīia ngā wāhi wātea ki ēnei kōrero:

- ngā matū/rawa me ngā tukanga ahuota
- te whakatipu i ētahi momo taewa i runga i ngā tikanga toitū
- te kai i tētahi kai tuku iho, me te whakatipu i runga i ngā tikanga toitū

- te kī ake e whai ana rātou kia iti ake ngā putanga waro, kia toitū ake ngā tikanga kimi oranga, pērā tonu i ngā tūpuna

Kua tuhia te kōrero i runga ake nei i runga i te titiro a tētahi kiritaki pēnā i a koe nā, i tō whānau rānei. Me tuhi anō, i runga i te titiro a Nick me tana rōpū.

He Kupu Taka

āhua taha ōkiko	<i>physical nature</i>	mahi i whakaritea māna	<i>fit for purpose</i>
āhua taha whakatinana	<i>functional nature</i>	mariko	<i>virtual</i>
āhuatanga ahurea	<i>cultural features</i>	matarua	<i>dual nature</i>
āhuatanga matua	<i>key characteristic/feature</i>	matauranga hangarau	<i>technological knowledge</i>
āhuatanga ōkiko	<i>physical properties</i>	otinga hangarau	<i>technological outcome</i>
āhuatanga pāpori	<i>social features</i>	pūnaha	<i>system</i>
āhuatanga whakatinana	<i>functional properties</i>	taonga hangarau	<i>technological product</i>
hāpori hangarau	<i>technological community</i>	tūātinini	<i>complex</i>
huatau hoahoa	<i>design concept</i>	tukanga hoahoa	<i>design process</i>
huri i ngā matū, i ngā pūngao, me ngā mōhiōhio	<i>transform materials, energy, and information</i>	wāhi e tika ana	<i>in situ</i>
ka paingia, ka pīrangitia	<i>desirability</i>	wānanga taha painga	<i>practical reasoning</i>
kawenga	<i>activity</i>	wānanga taha whakatinana	<i>functional reasoning</i>
mahi	<i>function</i>	whakaaro arohaehae	<i>think critically</i>

Ngā tauira, ngā taonga, me ngā pūnaha hangarau

Te whakatauiranga hangarau

Ko tēnei mea te tauira, he whakaaturanga o tētahi mea tūturu. I te ao hangarau, whakamahia ai te tauira hei whakaatu ka pēhea te āhua o tētahi mea mēnā ka whāia tonutia tētahi whakawhanaketanga hangarau. Nā runga i aua whakaaturanga, kua pai te whakatau iho me haere tonu, hei aha noa iho rānei, me whakarerekē rānei tētahi āhuatanga.

He taputapu whakawhanake matua te whakatauiranga hangarau i ngā pekanga hangarau katoa. Ahakoa he rerekē ngā mātauranga e noho tūāpapa mai ana ki ngā tauira o tēnā pekanga, o tēnā pekanga, e ōrite ana ngā huatau whānui. Hei tauira, he rerekē te tūāpapa mātauranga o te tauira i te hangarau koiora, tēnā i te tauira i te pekanga hoahoa whare.

Ko ngā poutoko o te whakatauiranga hangarau, ko te wānanga taha whakatinana, me te wānanga taha painga. Ko te wānanga taha whakatinana, e arotahi ana ki ēnei āhuatanga: “Ka taea te whakatutuki?” me “Me pēhea te whakatutuki haere?”. Ko te wānanga taha painga, e pātai kē ana i te pātai “e tika ana anō kia whāia tēnei huarahi?” Arā, e arotahi ana ki ngā āhuatanga pāpori, ngā āhuatanga matatika. Mā te kuhu atu i ngā momo wānanga e rua ki ngā mahi whakatauiranga hangarau, ka oti mai he arotakenga kauawhi whānui o te taonga hangarau me tōna pānga ki te ao.

Ka tīmata mai pea ngā mahi whakatauiranga i te whakaaro noa iho, me te whakawhitinga kōrero ki ētahi atu ringa hangarau. Kātahi ka hangaia pea he tauira 3-D, he tuinga rānei ki te pepa, ki te rorohiko rānei. Nāwai ā, ka tata ake ngā rawa ka whakamahia mō te tauira ki ērā ka whakamahia hei hanga i te taonga whakamutunga. Ā, mō te tauira taketake, ka whakamahia ngā rawa tūturu.



E rua ngā momo whakatauirā: ko te whakatauirā kawenga, me te hanga tauira taketake.

Ko te whāinga o te whakatauirā kawenga, he torotoro, he arotake i tētahi huatau hoahoa, nō reira ka kaha te whāia o tēnei momo whakatauirā i ngā takahanga tīmatanga o te whakaharatau hangarau. Ka kaha anō te whakawhirinaki ki te whakapae me te whakatau tata i ngā takahanga tīmatanga, i runga i ngā wheako kua puta ake i ētahi atu kaupapa. Mā te whakatauirā kawenga, tērā ka iti ake te moumou rawa, ā, ka mōhio mārire te ringa hangarau ka puta te taonga me te pānga ki te ao e āta hiahia ana ia kia puta.

Hangaia ai he tauira taketake hei arotake i te hāngai o tētahi taonga hangarau ki te mahi i whakaritea māna. Nō reira, ka puta te taonga, ā, ka haere ngā mahi whakatauirā taketake kia kitea ngā taunakitanga hei hanga whakatau i runga i te mōhio, e pai ake ai te taonga. Ko te arotakenga o te hāngai o te taonga ki te kaupapa i hangaia ai, ka inea i runga i te āhua o ngā whakatakotoranga whāiti e mau mai ana ki ngā tohutohu.

Pērā anō i ngā mahi whakatauirā kawenga, nā runga i ngā whakatau ka puta ake i te whakatauirā taketake, tērā ka turakina, ka whāmutua te kaupapa, tērā rānei ka kuhuna atu ētahi whakarerekētanga nui tonu.

Tēnā kia whāiti te titiro ki ngā kōrero mō ngā kai i whakatipuria e rātou mā. Āta whakaarohia ngā wāhanga o ngā tukanga ka takahia e Nick e rite ai ngā kai i ngā wā e tika ana.

- I whāia anō he mahi whakatauirā?
- Kei te kite rānei koe i ētahi mahi whakatauirā tērā pea e hāngai ana?

Whakaarohia te taha rokiroki (arā, te whare whakamātao). Tērā pea i whāia he mahi whakatauirā i konei.

- Ka pēhea te rua koia te mea e rite ana ki te whare whakamātao i ngā rā o mua?

Mēnā e whakaaro ana koe i kawea he mahi whakatauirā, ka whaihua rānei mēnā i kawea ko te whakatauirā taha whakatinana, ko te hanga tauira taketake rānei te mea e tino hāngai ana?

- He aha ngā take tērā ka whāia tēnā me tēnā momo?
- He hāngai ake tētahi momo whakatauirā ki ētahi takahanga o te ara whakawhanake, tētahi ki ētahi atu? He aha i pērā ai?

Whakakīia te tūtohi e whai ake nei hei whakaatu i te momo wānanga e whakaaro ana koe i noho tūāpapa mai ki ngā mahi whakatauirā o tēnei kaupapa:

Te momo whakatauirā	Te wānanga taha whakatinana	Te wānanga taha painga
Ko te whakatauirā taha whakatinana hei whakatau ko ēhea rawa/matū e tika ana, hei tauira, ko te rākau, ko te ukupani, ko te raima, ko te aha atu rānei.	Kia mātao tonu ai te taewa (kia pūmau ai te pāmahana).	I te mea kei te hiahia te whānau ki te taewa mō ētahi hui taihoa ka tū.

Ngā taonga hangarau

Ko te taonga hangarau he mea e taea ana te whāwhā, ā, nā te hoahoa tangata, nā te ringa tangata i puta ai ki te ao.

He mea nui kia mārama te tangata ki te hononga i waenga i ngā āhuetanga o ngā matū me te whakamahinga o te matū, e mārama ai ia ki tētahi taonga hangarau, ā, me pēhea te waihanga i taua taonga. Ka uru mai ki te karangatanga “taonga hangarau” ngā mea kikokiko tonu, pērā i te whakaahua ka tāia ki te pepa, tae atu ki ērā o te ao mariko, pērā i te whakaahua ā-mati e noho ana ki te rorohiko, ki te kōpae rānei.

Ko te mātauranga e noho tūāpapa mai ana ki ngā ariā mō ngā āhuetanga o te matū, tae atu ki te hanganga me te whakamahinga o ngā matū, kei te āhua tonu o ngā matū ka whakamahia hei hanga i tētahi taonga. Hei tauira, ko ngā māramatanga hei whakanao i tētahi kai, ka rerekē i ērā hei hanga i te papanga, i te taonga tāhiko rānei.

Nō te ao hou nei te hangarau matū. Heoi, kei te toro atu ōna kawekawe ki ētahi atu rerenga mātauranga kua roa e tū ana, e taea ai te huhua noa o ngā kawenga matū me ngā taonga matū whakahirahira tonu. Hei tauira, ko te aranga ake o ngā matū me ngā papanga “ihumanea”, arā, ko ngā matū ka urutau atu, ka urupare atu ki tētahi akiaki o waho, he akiaki hangarau tonu pea, he akiaki rānei nā te tangata. Nā te akiaki o waho, ka rerekē tētahi āhuetanga o roto i te matū, tana mahi rānei. Ko ētahi tauira o ngā taonga ka mahia ki te matū ihumanea, ko ngā kākahu aro ki te pāmahana, ko te papanga ka horoi i a ia anō, ko ngā mōwhiti aro ki te aho, me ngā uaua horihori.

Ko tētahi arotahinga nui o tēnei wāhanga, ko te pānga o te whakamahinga, te huringa, te hanganga rānei o te matū ki ngā huringa taonga me ngā mahi whakatina i ngā rawa. Mā konei e pakari ai te māramatanga hangarau ki te toitūtanga mō te wāhi ki te whakahaere rawa, ngā huringa taonga, me te porowhieuwhiu taonga.

Kia hoki ake anō ki ngā kōrero mō te whakatipu i te taewa me te kūmara. Whiriwhiria he aha ngā taonga. Me whai whakaaro ki ngā whakapaunga kaha a te tangata (a Nick, a ngā tūpuna, tae atu pea ki ngā iwi o whenua kē) i hua ai te taewa, te kūmara, me te kānga.

Nā runga i ngā kōrero i runga ake nei, he uaua pea te kite he taonga te kai i āta waihangatia. He mea hanga anō te kai ki tētahi matū, ki tāu titiro?

Tuhia ētahi paearu mai i ngā pārongo i runga nei hei āwhina i a koe ki te whakatau iho he taonga waihanga rānei, he aha kē rānei te taewa, te kūmara, me te kānga. Hei tauira:

- Nā te ringa tangata i puta ai ki te ao? (Āe/Kāo)
- I whakamahia he mātauranga anō hei whakaputa i te kai? (Āe/Kāo)
- He mea waihanga ki te rawa e whāomoomo ana i te pūngao, nō roto anō i tētahi hurihanga? (Āe/Kāo)

Ngā pūnaha hangarau

Ko te pūnaha hangarau, he huinga wāhanga e hono tahi ana, ko tāna mahi, he huri, he pupuri, he kawē, he whakatina rānei i te matū, i te pūngao, i te pārongo rānei.



Nā te hoahoa tangata, nā te ringa tangata i puta mai ai he pūnaha ki te ao, engari ina takoto he pūnaha, ka mutu i reira ngā mahi hoahoa a te tangata e tutuki ai i te pūnaha tāna mahi. Hei tauira, ina whakamahi te tangata i ngā pereki hei whakatū i tana waka (ka oti i a ia he mahi hei whakaara ake i te pūnaha), ehara i te mea me oti anō i taua tangata he mahi hoahoa e tika ai te mahi a te pūnaha whakatū a te waka.

Ko ngā mātauranga hangarau o tēnei wāhanga, ko te mārāma ki ngā mea ka whakaurua, ngā putanga, ngā tukanga hurihanga, me te whakatina. Ko te mārāma anō ki te tikanga o te “pouaka pango” tētahi mea ka tirohia.

Arā ētahi o ngā mea ka whakaurua, ko te tangata, ko ngā taonga hangarau, ko te moni, ko te rawa māori, ko te pārongo, ko te pūngao. Ko te tino putanga, ko te otinga e tika ana kia hua ake i te pūnaha. Hei tauira, ko te putanga o tētahi pūnaha whakanao hēki Aranga, he matū ka hurihia, arā, ko te hēki tonu. Ko te putanga o tētahi pūnaha whakapāpā ā-waea, ko te pārongo ka hurihia, ka kawea, arā, ko te reo ka kawea, ka pā atu ki wāhi kē.

Ko ngā tukanga hurihanga, ko ngā tukanga o roto i tētahi pūnaha e āta hurihia ai ngā mea ka whakaurua hei putanga, me te ū ki tērā i whakaarohia e te tangata mō te pūnaha ka tahi, e kore ai te tangata e mate ki te mahi hoahoa atu anō ka rua.

Arā ētahi huatau i roto i te hoahoanga me te kawenga o te pūnaha hangarau e tika ana kia tūhuratia. Ko ētahi, ko te piki kawenga me te tōtika o te mahi.

Ko tētahi āhua o te piki kawenga, ko te hoatu i tētahi momo tāpiritanga ki te pūnaha hei āhuatanga haumaruru, hei “ora kāinga rua”. Ko te tōtika o te mahi, ko te ū tonu o ngā wāhanga o te pūnaha ki te mahi i whakaritea mā tēnā, mā tēnā, mō te wā e tika ana. He mea nui te tōtika o te mahi me te piki kawenga i te ahumahi rererangi.

Ko ngā pūnaha whakanao manomano hei tauira o te pūnaha kua nui ōna pānga ki te ao. Kua noho ko te “pouaka pango” tētahi wāhanga o ngā pūnaha whakanao o ēnei rā. He wā anō he pūnaha iti te pouaka pango nō te pūnaha nui ake.

Ā tēnā, whiriwhiria mēnā he tukanga hangarau ka whāia hei whakatipu i te taewa, i te kūmara, i te kānga i ngā rā kei te heke iho. Ina whakaarohia ngā pūnaha hangarau o ngā rā kei te tū mai, ka whāihua tonu pea te “tuketuke i ngā poutawhā”, te whakaaro “i waho o te tapawhā”, engari ko te mea nui, kia mātua noho mai ngā āhuatanga katoa e kīia ai tētahi mea he pūnaha hangarau. Kia kore ai koe e mate ki te whakaaro ki te whānuitanga atu o te tukanga hangarau, me tīmata kē pea ki ētahi tohutohu.

Kei te rite ēnei āhuatanga katoa:

- He huinga wāhanga e hono tahi ana?
- E uru mai ana he matū, he pūngao, he pārongo rānei?
- Nā te hoahoa tangata, nā te ringa tangata i puta ai ki te ao?
- He tūāpapa mātauranga hangarau tōna?
- He mea anō ka whakaurua atu?
- He mea anō ka puta mai?
- Kei konā ōna anō tukanga panoni?
- Kei konā ōna anō tukanga whakatina?
- He pūnaha pouaka pango tōna?

Me mātua noho mai he pouaka pango. Ka whaihua tonu te whakaatu i te pūnaha hei tuinga – he mea mahi ā-ringa, ā-rorohiko rānei. Me whakarārangi anō ngā waitohu ka whakamahia me ngā whakamārama kia mōhiotia ai he aha katoa ngā wāhanga o te pūnaha. Whiriwhiria he huarahi e mōhio ai koe mēnā ka tika tana mahi. Rangahaua ētahi atu pūnaha hangarau hei āwhina i a koe. Hei tauira, ko ngā pūnaha whakanao. (Whiriwhiria tētahi mea e whai tikanga ana ki a koe, pērā i te ara whakanao waka, tētahi atu taonga rānei e whaitake ana ki a koe.)

He Kupu Taka

āhuatanga o te pūnaha hangarau	<i>features of a technological system</i>	papanga ka horoi i a ia anō	<i>self cleaning textiles</i>
e uru mai ana he matū, he pūngao, he pārongo rānei	<i>involving materials, energy, or information</i>	piki kawenga	<i>redundancy</i>
hangarau matū	<i>materials technology</i>	porowhiuwhiu taonga	<i>product disposal</i>
he mea anō ka puta mai	<i>has outputs</i>	pouaka pango	<i>black box</i>
he mea anō ka whakaurua atu	<i>has inputs</i>	pūnaha	<i>system</i>
hoahoa tangata	<i>human design</i>	putanga	<i>output</i>
huatau hoahoa	<i>design concept</i>	rawa māori	<i>raw material</i>
huatau whānui	<i>generic concept</i>	taonga hangarau	<i>technological product</i>
huinga wāhanga e hono tahi ana	<i>set of interconnected parts</i>	taonga matū	<i>material product</i>
huringa taonga	<i>product life cycle</i>	taputapu whakawhanake matua	<i>key development tool</i>
kākahu aro ki te pāmahana	<i>heat regulated clothing</i>	tauira taketake	<i>prototype</i>
kauawhi whānui	<i>holistic</i>	taunakitanga	<i>evidence</i>
kei konā ōna anō tukanga panoni	<i>has transformation processes</i>	toitūtanga	<i>sustainability</i>
kei konā ōna anō tukanga whakatina	<i>has control processes</i>	tōtika o te mahi	<i>reliability</i>
mahi i whakaritea māna	<i>fitness for purpose</i>	tūāpapa mātauranga hangarau tōna	<i>identified technological knowledge base</i>
mariko	<i>virtual</i>	tukanga hurihanga	<i>transformation processes</i>
matū "ihumanea"	<i>SMART materials</i>	uaua horihori	<i>artificial muscle</i>
mea whakaurua	<i>input</i>	wānanga taha whakatinana	<i>functional reasoning</i>
mōwhiti aro ki te aho	<i>light responsive sunglasses</i>	wānanga taha painga	<i>practical reasoning</i>
nā te hoahoa tangata, nā te ringa tangata i puta ai ki te ao	<i>exists in the world as a result of human design</i>	whakanao	<i>production</i>
ngā tauira, ngā taonga, me ngā pūnaha hangarau	<i>technological models, products, and systems</i>	whakanao manomano	<i>mass production</i>
		whakatauiria hangarau	<i>technological modelling</i>
		whakatauiria kawenga	<i>functional modelling</i>
		whakatina	<i>control</i>



Ngā Āhuetanga Hangarau

Ngā hiahia me ngā huarahi e wātea ana

Mā te tautohu i tētahi take me tōna horopaki e kitea ai ngā hiahia me ngā huarahi wātea tūturu. Ka noho ko taua hiahia, taua huarahi wātea rānei te whāinga whai takenga mō te whakawhanaketanga hangarau, ā, ka hāngai tonu, ka whāiti tonu ngā tohutohu ka takoto ki taua hiahia, ki taua huarahi rānei.

Mō te wāhi ki a Nick me tana mahi, he kaimātai ahumāra ia, nō reira he mōhio pai ia ki te whakatipu taewa. He mōhio anō tana rōpū ki ngā tikanga whakatipu kai a ngā tūpuna, me ā rātou tikanga rokiroki kai mō ngā rā kei tua.

- Ki ō whakaaro, he aha i ngākaunui ai a Nick me tana rōpū ki te kaupapa e kawe nei rātou?
- He aha ngā kōrero a te koroua?
- Kei te whakatipuria noatia ngā taewa nei i te mea he kai reka ki a rātou?
- He aha i oti te hiahia tūturu i tahuri ai rātou ki te hāpai i tēnei kaupapa?

Ko te huarahi i wātea, ko te whakaaro ki tētahi huarahi rerekē hei whakatipu, hei rokiroki taewa i tēnei ao e noho nei tātou.

- He aha ētahi o ngā mea o ēnei rā kua rerekē, ina whakatairitea ki te āhua i neherā?
- He aha ngā kōrero a Nick, i tana whakatairitea i te whare whakamātao ki te rua?
- He aha ētahi mea ka taea te whiriwhiri i runga i te whakaaro puta kē mō te wāhi ki te whakatipu me te rokiroki taewa?
- He pēhea te whakaputa a Nick me tana rōpū i ō rātou whakaaro kia mōhiotia ai he whakaaro whaitake, he whakaaro whai tikanga?

Te toitūtanga

He mea nui te toitūtanga. Ahakoa he aha te mahi i te ao nei, i runga i te kaupapa o te toitūtanga me mātua whai kia kaua e puta he hua kino i taua mahi ki a Papatūānuku, ki a Ranginui. Me āta penapena ngā rawa māori, me āta tiaki te taiao hei oranga, hei pārekarekatanga mā ngā uri whakaheke. I te wā ki ngā tūpuna, arā ngā tikanga pērā i te rāhui hei toitū i ngā rawa māori. He tikanga pai te rāhui e whakatina ai, e penapena ai ngā iwi i ā rātou rawa.

Āta whakaarohia ngā mahi a Nick.

- Ki ōu nā whakaaro, he aha ngā take toitūtanga ka uru mai ki ā rātou whiriwhiringa?
- He aha ngā huarahi ka whāia hei whakatatū i aua take?
- Ka pēhea tā rātou whai kia rawaka ngā tinaku e haere tonu ai ngā mahi whakatipu taewa?
- He mea nui kia āta whiriwhiria ēnei tūmomo āhuetanga. He aha i pērā ai?
- He rerekē tā Nick whakatatū i ngā take toitūtanga, tēnā i tā ngā Māori o nehe?

Ngā mōhiotanga o ngā tūpuna

Kei ngā tūpuna ngā mōhiotanga, ngā pūkenga, me ngā māramatanga ki tō rātou ao e noho ora ai rātou i Aotearoa i mua noa atu i te taenga mai o tauīwi. Ka mutu, i āta haere kōtui ērā āhuatanga me te taha wairua.

He nui ngā kōrero a Nick me te kaumātua i runga i te kōpae ataata mō ngā mātauranga o ngā tūpuna.

- He aha ētahi o ēnei mātauranga?
- Kei te kite anō koe i tētahi hononga ki te taha wairua i roto i tēnei kaupapa?
- He pēhea te pānga o te mōhio ki ēnei mātauranga ki ngā kawenga a Nick?
- Āe rānei he mea nui kia mōhio a Nick ki ngā mātauranga o ngā tūpuna?
- Me pēhea te whai a Nick kia riro i te hunga pīrangi whakatipu i te taewa ngā mātauranga e ea ai tō rātou hiahia?
- He aha ētahi o ngā huarahi e rapua ai ngā mea i mōhiotia, i kawea e te Māori i ngā rā o mua?

Ngā uara me ngā whakapono

I haere kōtui anō ngā mōhiotanga, ngā pūkenga me ngā māramatanga o ngā tūpuna ki ō ratou uara me ō rātou whakapono. E karapoti ana ēnei āhuatanga i ngā huatau pērā i te wairua, i te aroha, i te manaakitanga, i te kaitiakitanga, me ngā kawenga e tika ana, arā, ko ngā tikanga tonu ērā.

I a Nick rāua ko Pita e kōrero ana mō te whakatipu me te rokiroki i te taewa, he aha ētahi o ngā uara me te whakapono ka whakahuatia ake?

- Mō rāua ake, he aha ngā painga o te kawea i ēnei mahi e mahi nei rāua?
- He aha rāua e whakaaro nei he mea nui kia whāwhāria ngā tikanga o neherā i ēnei rā?
- He aha te tino o te taewa e noho taonga ai te taewa ki a rāua?
- He aha tā te Māori ina hauhakea e ia ana kai? Ka puritia te katoa māna ake?

Te pānga ki te iwi

He huhua tonu ngā pānga o te otinga hangarau ki te iwi, ki te hāpori. Heoi anō, ko te tikanga, he pānga e taea ana te ine.

- Me pēhea te kimi mai i te pānga ki te iwi/hāpori?

Arā tētahi huarahi, ko te uiui haere i ngā tāngata kua rongō i ētahi o aua pānga. Tērā pea ka whakatairitea ngā raraunga ka kohia i mua me ērā ka kohia i muri i te tatūnga o te otinga hangarau.

- I whai hua anō?
- He pēhea nei te kaha o te whai hua?
- Ki ō whakaaro, ka pai te uiuinga hei kimi mai i te pānga o te taewa ki te iwi/hāpori? He aha ētahi huarahi kia whāia e Nick e mōhio ai ia mēnā he uara o āna mahi ki e te iwi/hāpori?
- He aha ētahi momo tāngata ka hiahia mōhio ki te kaha rata mai o te iwi/hāpori ki te taewa? Ko wai mā ka uiuitia e rātou?
- He aha ētahi o ngā pānga o te whakatipu me te rokiroki taewa? Ka iti ake ngā moni ka pau ki ngā toa hoko huawhenua? Ka kaha ake tō rātou āhei ki ngā kai e manakohia ana e rātou?



- Mēnā i tokomaha noa ake ngā tāngata e whakatipu ana i ā rātou ake kai, he aha te pānga ki ngā whare hokomaha me ngā toa huawhenua?
- Ka pēhea te taha ki te whenua – ka iti ake te whenua e wātea ana mēnā ka tahuri te tokomaha ki te whakatipu taewa?
- Me pēhea e whakatutuki e te hunga noho tāone te whakatipu taewa? Me pēhea tā rātou mahi tahi ki te kawē i tētahi kaupapa pēnei?
- Ka pēhea te wāhi ki te whare whakamātao? He tikanga anō hei whai mā rātou ki te nui rawa te utu o te whare whakamātao?
- Ina whakaarohia ēnei āhuatanga katoa o te hangarau, ki ōu nā whakaaro, he otinga hangarau pai ngā mahi a Nick e pā ana ki te taewa?



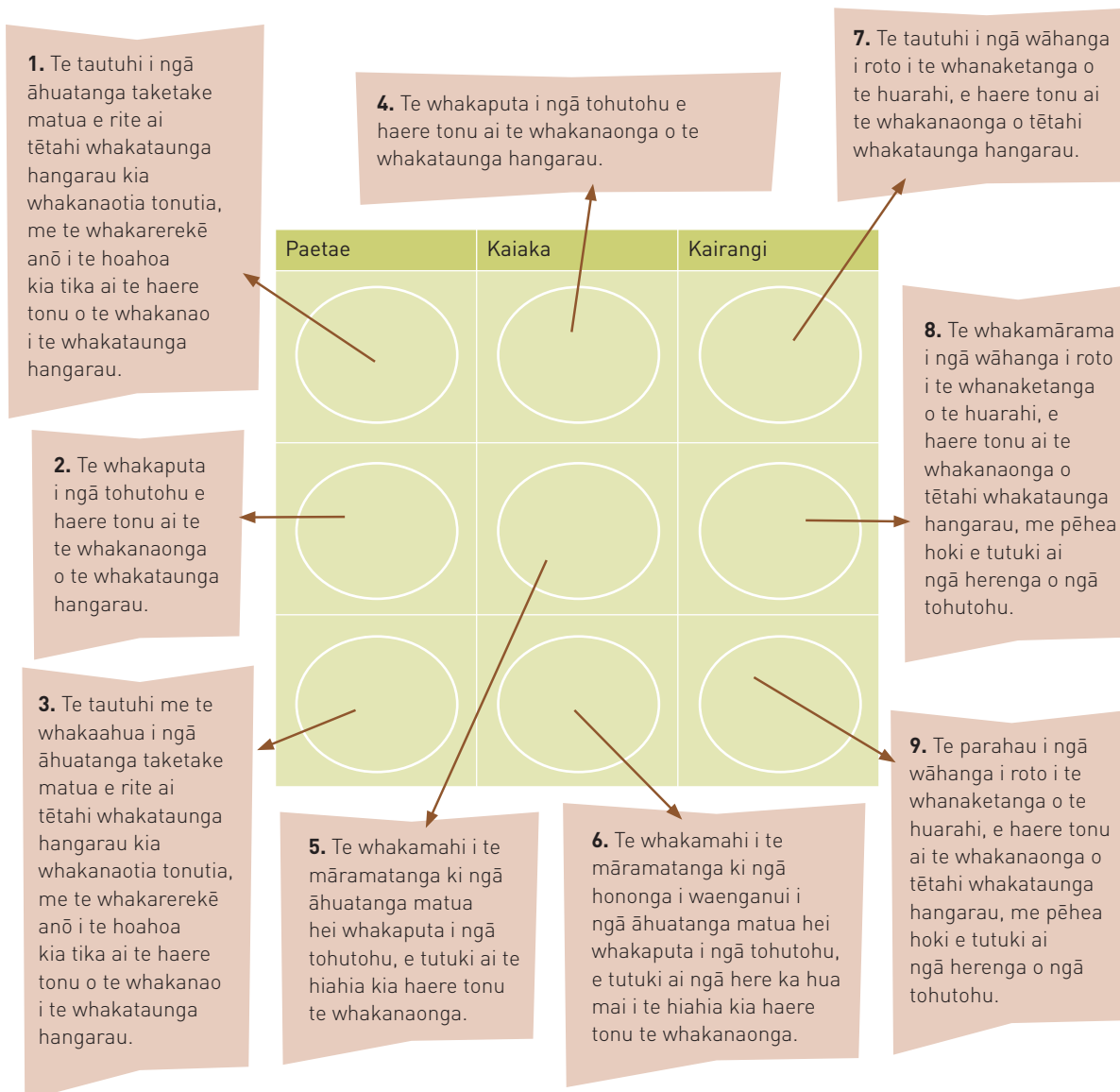
Te Aromatawai

He aromatawai i te tukanga hangarau me te whakamahi anō i ngā paerewa paetae

Paerewa Paetae 90048 (hei taurira)

Te whakawhanake i tētahi huarahi e haere tonu ai te whakanaonga o tētahi whakataunga hangarau.

Paearu Paetae





Paerewa Paetae 90048: Te whakawhanake i tētahi huarahi e haere tonu ai te whakanaonga o tētahi whakataunga hangarau

Ko tā te Paerewa Paetae, he āta whakaatu he aha ngā mea kia tutuki e kīia ai kua “eke paetae”, kua “eke kaiaka”, kua “eke kairangi” rānei te ākonga i runga i tēnā, i tēnā paearu ka whakarārangitia. Ko te “eke paetae” e tohu ana ka taea e te ākonga te mea e tohua ana i te taitara o te paerewa. I konei, ki te kīia kua eke paetae koe, e tohu ana tērā ka taea e koe te whakatakoto huarahi e haere tonu ai te whakanaonga o tētahi otinga i hua ake i te whakaharatau hangarau. Ko te kaiaka, e tohu ana kua neke atu i tērā te pai o tō kawē i ngā mahi, ā, ko te kairangi, koirā te mea pai katoa ka taea. (Kei raro nei te roanga atu o ngā kōrero mō tēnā, mō tēnā.)

E eke paetae ai koe, me tutuki pai i a koe:

- te kōwhiri i tētahi otinga ka haere tonu tōna whakanaonga;
- te tautohu i ngā āhuatanga matua e kīia ai tēnei otinga he pai, he tau;
- te whakapai ake i te hoahoa kia tino tau ai, kia tino hāngai ai;
- te tārai tohutohu e haere tonu ai te whakanaonga o te otinga;
- te tautohu i ngā takahanga me ngā āhuatanga katoa e rite ana e haere tonu ai te whakanaonga.

Mō te Paerewa Paetae 90048, ina mātakitaki koe i te kōpae ataata me te pānui i ngā kōrero e hāngai ana, mā tō kaiako koe e ārahi ki te whakatutuki i ngā paearu, me te whakamahi anō i Te Anga Whakaū Māramatanga ki te Tukanga Hangarau. I a koe e titiro ana ki ngā paearu, āta whakaarohia te kaupapa e wherawherahia ana i te kōpae me te pukapuka. Tērā pea ka ahu mai ō whakaaro i te kaupapa tonu, tērā rānei ka whakamahia ētahi o aua kōrero hei toro i tētahi atu mea e noho whanaunga ana ki taua kaupapa. Ko tētahi wāhanga o te anga, ko “Ngā tauira, ngā taonga me ngā pūnaha hangarau”. Kei reira ētahi kōrero mō te āhua o te otinga, arā, mēnā he tauira, he tukanga rānei. Tērā ka whaihua anō hoki tō titiro ki Te Whanaketanga me te Arotaketanga o te Otinga Hangarau – he āwhina pea kei reira mō te whakawhanake me te arotake i tō otinga kia haere tonu ai te taha whakanao. Tērā rānei kei Ngā Āhuatanga Matua o te Hangarau me ngā Otinga Hangarau ētahi āwhina e mārāma ake ai koe ki te āhua o tō otinga. Ā, mō te wāhi ki te hāngai, mō te tau o te otinga, ka whaihua anō pea te titiro ki ngā mōhiotanga o ngā tūpuna, ngā uara me ngā whakapono.

Hei ārahi i a koe:

Ngā paearu	Te Anga Whakaū Māramatanga ki te Tukanga Hangarau
Te kōwhiri i tētahi otinga ka haere tonu tōna whakanaonga	Te Whanaketanga me te Arotaketanga o te Otinga Hangarau
Te tautohu i ngā āhuatanga matua e kīia ai tēnei otinga he otinga pai, he otinga tau	Ngā Āhuatanga Matua o te Hangarau me ngā Otinga Hangarau Ngā mōhiotanga o ngā tūpuna, ngā uara, me ngā whakapono
Te whakapai ake i te hoahoa kia tino tau ai, kia tino hāngai ai	Te Whanaketanga me te Arotaketanga o te Otinga Hangarau
Te tārai tohutohu e haere tonu ai te whakanaonga o te otinga	Te Tārai Tohutohu
Te tautohu i ngā takahanga o te whakanaonga taumano	Ngā tauira, ngā taonga me ngā pūnaha hangarau

E eke kaiaka ai koe, me tutuki pai i a koe ngā mea o runga ake nei, me ēnei anō:

- te whakaahua i ngā āhuatanga matua kua tautohua;
- te whakamahi i te mārama ki ngā āhuatanga matua i roto i te tārainga o ngā tohutohu;
- te whakamārama i ngā takahanga me ngā āhuatanga e rite ana e haere tonu ai te whakanaonga.

Ko te rerekētanga o te eke paetae i te eke kaiaka, ko te āhei ki te whakaahua i ngā āhuatanga matua kua tautohua, ko te whakamahi i tō mārama ki ērā i roto i te tārainga o ngā tohutohu, tae atu ki te whakamārama i ngā takahanga matua kua tautohua me ngā āhuatanga e rite ana e haere tonu ai te whakanaonga.

E eke kairangi ai koe, me tutuki pai i a koe ngā mea o runga ake nei, me ēnei anō:

- te whakamahi i te mārama ki ngā hononga i waenga i ngā āhuatanga matua i roto i te tārainga o ngā tohutohu, me te aro atu ki ngā mea tērā ka here, ka whakararu i te haere tonu o ngā mahi whakanao;
- te hoatu taunakitanga hei tautoko i ngā takahanga me ngā āhuatanga e rite ana e haere tonu ai te whakanaonga.

Ko te rerekētanga o te eke kaiaka i te eke kairangi, ko te āhei ki te whakamahi i te mārama ki ngā hononga i waenga i ngā āhuatanga matua i roto i te tārainga o ngā tohutohu, me te āhei ki te hoatu taunakitanga hei tautoko i ngā whakatau mō ngā takahanga me te whakanao tonutanga.

He Kupu Taka

āhuatanga taketake matua	<i>key factor</i>	tautuhi	<i>identify</i>
e tutuki ai te hiahia	<i>address the need</i>	whakaahua	<i>describe</i>
herenga	<i>requirements</i>	whakanaotia tonutia	<i>ongoing production</i>
Paerewa Paetae	<i>Achievement Standard</i>	whakaputa	<i>formulate</i>
parahau	<i>justify</i>	whakataunga hangarau	<i>technological outcome</i>



He Kupu Taka

āhua ā-mahi	<i>technique</i>
arotake	<i>evaluate</i>
arotautanga	<i>optimisation</i>
auaha	<i>creative; innovative</i>
hangarau kai	<i>food technology</i>
hangarau koiora	<i>biotechnology</i>
hangarau whakatina	<i>control technology</i>
hapori	<i>community</i>
hinengaro auaha	<i>ingenuity</i>
hiranga	<i>excellence; superior</i>
hātepe/tukanga	<i>process</i>
hoahoa	<i>design</i>
huarahi wātea	<i>opportunity</i>
kaka-aku	<i>textile</i>
kawenga	<i>activity</i>
kiritaki	<i>customer; client</i>
kirihou	<i>plastic</i>
koiora	<i>biology</i>
konganuku	<i>metal</i>
korehāhā	<i>extinct</i>
kōwhiri	<i>select</i>
kounga	<i>quality</i>
māia	<i>confidence</i>
matatika	<i>ethics</i>
mātau	<i>know; understand</i>
matū	<i>material</i>
matū waihanga	<i>synthetic material</i>
mauroanga	<i>durable</i>
ohaoaha	<i>economics</i>
pāpā	<i>impact</i>
pāpori	<i>social</i>

parahau	<i>justify</i>
paturopi	<i>antibiotics</i>
pūhanga manawa	<i>mechanical</i>
pūkenga whakahaere mahi	<i>project management skills</i>
pūnaha	<i>system</i>
rauropi	<i>living organism</i>
rautaki	<i>strategy</i>
rawa	<i>resource; material</i>
rawa ora	<i>living material</i>
rerehua	<i>aesthetics</i>
tāhiko	<i>electronics</i>
taukumekume	<i>debate</i>
tautohu	<i>identify</i>
tauwhāiti	<i>specific</i>
tikanga haumarū	<i>safety procedure</i>
toitū	<i>lasting; sustainable</i>
tōrangapū	<i>political; politics</i>
tūhura	<i>explore; investigate</i>
tukanga/hātepe	<i>process</i>
tuku mōhiōhio	<i>information transfer</i>
urupare	<i>feedback; response</i>
utauta	<i>equipment</i>
whai kiko	<i>purposeful</i>
whai patanga	<i>purposeful; useful</i>
whaiaro	<i>personal</i>
whakaharatau hangarau	<i>technological practice</i>
whakahiato	<i>develop</i>
whakatairanga	<i>promote</i>
whakataurite	<i>compare</i>
whakawhanake	<i>develop</i>

