



Te Whare Tautaiiao, Tū Ana, Tau Ana



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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Nā Deanne Thomas ngā kōrero mō te mātaitanga i tēnei pukapuka.

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I hangaia tēnei rauemi hei tautoko i
Te Marautanga o Aotearoa



Te Whare Tautaiiao, Tū Ana, Tau Ana

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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 taurira tūturu o ngā whakaharatau hangarau – o neherā, o nāiane 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 Whakatinana
- 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 14 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 15–28 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 14. 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 mōhio o te ākonga 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 paearu, 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 Mātaaitanga – Te Whare Tautaiiao, Tū Ana, Tau Ana

Ngā tūmomo whare hauropi

Kei roto i tēnei kōpaki hangarau ngā tauira e toru o tēnei mea, te whare hauropi. Ahakoa he rerekē ngā hiahia o ngā tāngata, ngā hātepe, me ngā otinga ka puta, ka kitea tonutia ngā tauritenga i waenga i ngā tauira katoa.

He kaihoahoa whare a Rau Hoskins. Ahakoa te nui o āna mahi, kotahi te whāinga matua. Arā, ko te hoahoa i ngā momo whare me te whakamahi i ngā rawa whakahou kia tutuki ai ngā hiahia o ngā tāngata Māori. Kua hoahoaia e ia ētahi whare koirā huri noa i Aotearoa. Nāna ngā rangahau mō tēnei kaupapa, nāna ngā whānau me ngā hapū i tautoko ki te whakapai i ō rātou momo whare i runga i ngā marae. Ā, nāna anō tōna ake kāinga i hanga i tōna papa kāinga, i Whangaruru.



Rau Hoskins.
Kaihoahoa whare

He aha ngā rawa whakahou e kōrerotia ake nei? Koinei ngā rawa ka puta ake anō, ka “wana” ake anō ahakoa te nui ka whakapaungia. Arā, ko te hau, ko te wai, ko te kōmaru hoki.

Ka whakaaro anō a Rau ki a Papatūānuku me ngā painga ki a ia, i a Rau e hoahoa whare ana. Kua rangahaua e Rau ngā rawa o te taiao Māori tērā ka pai hei hanga whare. Ko te uku, te raupō, te muka, me te wīwī ētahi rawa pai.

He whare uku

Ehara tēnei i te mahi hou. Mai rā anō kua tū he whare pēnei huri noa i te ao whānui. Kei Ingarangi, kei Mēhiko, kei Ihpa hoki ētahi momo. I Aotearoa nei, i ngā wā o mua, i hangaia ētahi whare ki te oneone, te uku, me te tākakau. Ka whakahanumitia, ka mirimiria kia hono ai ki te tūāpapa kōhatu. Ā, ka whakaahuatia hei pakitara. Koinei te tīmatanga o te hanga whare uku. Kei te tū tonu ētahi o ēnei momo whare i Aotearoa i nāianei. Kei Molesworth Station, i Te Taihū o te Waka a Māui, ētahi. I hangaia ngā whare nei hei whakaruruhau mō ngā kaipāmu i te tau 1866, hei whare mō te whānau, hei huihuinga anō hoki mō te hāpori whānui.

Rangahaua tēnei momo hanga. Tautohua ngā pūnaha me ngā rawa ka taea tonu te whakamahi i tēnei wā.

Pakeke ake te
whare nei i te
140 tau.
I hangaia mai
i ngā rawa
whakahou.



He pai ake te hanga whare ki te oneone, ki te tūtae kararehe, ki te haumata me te wai nā te mea kāore e turakina ngā rākau. Ko tētahi atu painga, nā te whānui o ngā pakitara, ka āhua mātao tonu a roto i te raumati, ā, ka mahana i te takurua. Ka inakitia te tuanui ki te haumata. E kitea tonutia ana te kounga o te whare.

He tino kaupapa te hanga whare ki ngā rawa whakahou. Heoi anō, e tika ana kia tūhuratia te mauroanga, te kounga, te tōtika ā-utu me te tōtika ā-mahi mō ngā hāpori Māori e noho ana i runga i ō rātou ake whenua. Mō ētahi, ka tawhiti tonu ō rātou pito whenua i te tāone. Nā reira he nui te utu ki te mau atu i ngā rawa i te tāone ki ō rātou kāinga.

He kaha a Rau ki te tautoko i ngā tāngata e hiahia ana ki te whakapai ake i ō rātou marae. Nā te koroua kē o ngā whare kei ētahi marae kua ngoikore haere ngā pūnaha, arā, ngā pūnaha mō te kawē para, te hari wai, me tērā anō mō te hiko.

Engari he momo whare anō e hoahoaina ana, e hangaia ana e ngā tāngata Māori i ngā tāone, hei whakaea i ngā hiahia o te hāpori. Ā, ka tautoko anō a Rau i ēnei momo hanga. Koia ērā ko ngā marae, ngā kura, ngā wāhi huihui mō te hāpori. Ahakoa he rerekē te hoahoa, ngā rawa, me ngā hātepe hangahanga, he taurite ngā matea matua o te whānau, arā, ko te hui tahi, ko te whakawhanaungatanga, ko te manaaki.

E tika ana kia āta whakaaro ki te āhua o ngā marae, me ngā hiahia o ngā tāngata i ngā wā e heke mai nei. E ai ki a Rau, i ngā wā o mua, kotahi te tangata nāna te whare i hoahoa, nāna ngā whakatakotoranga i whakaae, nāna hoki i hanga i ētahi wā. Ko te tohunga whakairo tērā. I nāianei he rerekē te kaihoahoa, te kaihanga, te kaiwhakarite mahi, me te kaiwhakarākei. Ko te mahi a te kaiwhakairo, ko te whakairo anake. Kua whāiti haere te kete pūkenga a tēnā, a tēnā.



Te Kura Tuarua o Alfriston

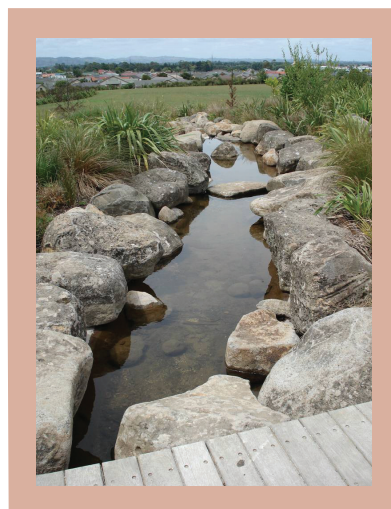
Ko Rau hoki tētahi o ngā kaihoahoa i āwhina ki te hanga i tētahi kura tuarua hou ki Tāmaki Makaurau, ko Alfriston Te Kura Tuarua. Kei Manurewa te kura o Alfriston e tū ana.

I hangaia Te Kura Tuarua o Alfriston i te mea kua kikī rawa ērā atu kura tuarua o taua takiwā. I konā ka wātea mai te huarahi ki te hanga i tētahi kura i runga i te whakaaro hou, i runga anō i te āhua o ngā matea o te kiritaki, arā, o ngā ākonga o te rautau 21.

E rua ngā whakaaro matua o te kaihoahoa. Tuatahi, he aha ngā mea tino tika mō te taiao whenua. Tuarua, he aha ngā mea e tika ana mō rātou e ako ana i roto i te taiao whakaako. Nō reira, kei te anga te kura ki te raki ki te hopu i ngā hihi o Tama-nui-te-rā. Mā konei e mahana noa ai ā-roto, e iti ake ai te whakamahi o ngā whakamahana. Kua tū hoki he pūnaha whakawhitinga pōkākā kia iti ake te hauhā me te tāoke ki te akomanga. Nā taua pūnaha ka whakahoutia te hau takiwā o ia akomanga i ngā wā e ono i ia haora, i ia haora. Nā tēnā, ko te tikanga ka koi te hinengaro, te tinana me ngā roro o te ākonga mō te rā katoa. E ai ki ngā rangahau, mēnā he rahi te hauhā i te akomanga, ka ngenge, ka ngoikore te ākonga, kāore e kaha ki te aro ki ngā mahi. Ka kaha ake te tūpono pā o te *huangō* ki te hunga kei a rātou tērā mate.

He painga anō tō te whakawhitinga pōkākā, ka iti ake te hiko ka pau me ngā parakino i te hau.

Kei Alfriston anō tētahi pūnaha whāomo i te wai. Ka kohia mai te ua i te tuanui, ka rokiroki ki raro i te whenua. E toru ngā whakamahinga, tuatahi ka rere tētahi wāhi o ngā wai nei ki tētahi repo, he mea āta waihanga hei wāhi ako pūtaiao mā ngā ākonga. Tuarua, ka papua atu ki tētahi kōawa. I reira ka uru atu anō he hāora ki roto, kātahi ka whakahokia mai hei wai mō ngā whare kaukau o te kura. Ko te whakamahinga tuatoru, hei whakamākūkū haere i ngā papa hākinakina.



Ka tū Te Kura Tuarua o Alfriston ki Manurewa, he kura hou, he kura tautaiiao.

He aha ētahi atu rautaki tautoko i te taiao ka taea e ngā kura hou te whaiwhai haere?
Tuhia ōu whakaaro hei kōrero kia tāpaea ki ngā kaihoahoa kura.

Kua tū mai Te Kura Tuarua o Alfriston hei tauira kia whāia e ētahi atu. Ahakoa he kura hou, kei reira ētahi mātāpono hangarau mō ngā kura katoa me ā rātou ākonga anō.

Te hanga whare ki te papa kāinga

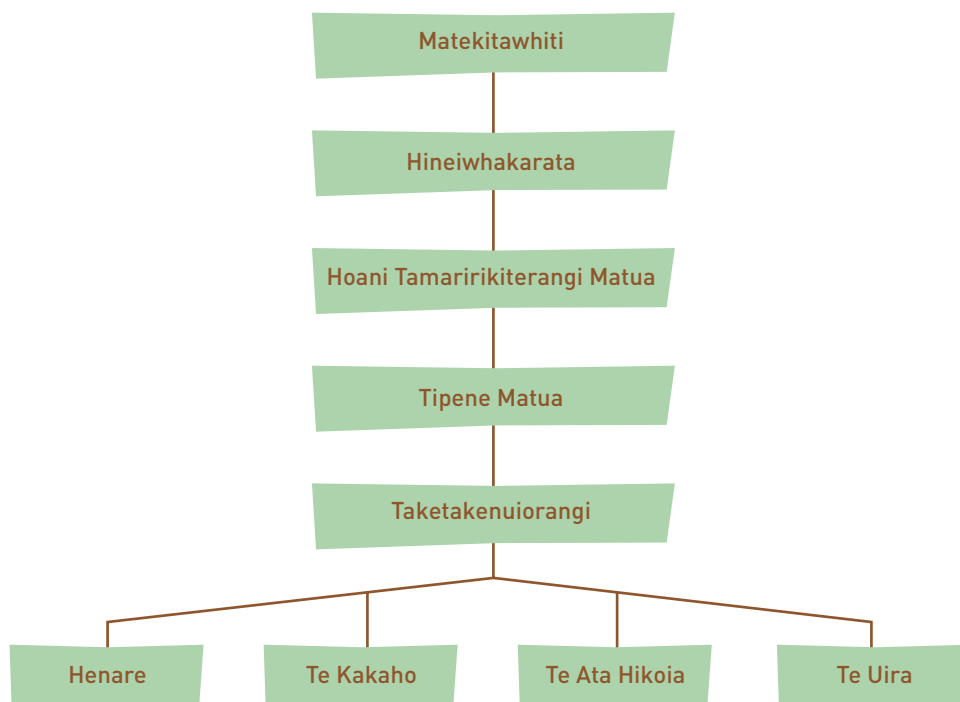
Ko te nuinga o ngā papa kāinga kei ngā wāhi taiwhenua. I ētahi wā he tawhiti rawa atu ēnei i ngā tāone. Kāore he hiko o ētahi, kāore he pūnaha whiu para, he ruapara rānei.

Kei te rohe o Ngāti Kahungunu tētahi tāone paku, ko Pōrangahau te ingoa. Ahakoa ka tika te rere o te hiko ki reira, ā, he ruapara, he ipu tukurua anō kei taua tāone, e 40 meneti te tawhiti atu o Pōrangahau i Waipukurau mā runga waka. He hawehawe te huarahi, he tāone taiwhenua tonu.

Ko David Tipene-Leach rāua ko tōna hoa, a Sally Abel, ētahi tokorua e whakarite ana i tētahi pito whenua i reira mō te hanga whare. He whenua Māori tō rātou ko te whānau whānui. He tākuta a David, he kairangahau a Sally, ā, ā tōna wā ka nuku rāua ki Pōrangahau noho ai.

Ka hangaia te whare ki runga i te papa kāinga o tō rātou tupuna, a Taketakenuiorangi. He mea tuku iho te mana whenua ki te tokomaha. Kua whakaae te whānau kia whakatūria e te mātāmua, e David, tētahi whare ki runga i tēnei whenua hei whare whakaruruhau mō rātou katoa.

Kua whakaaetia e rātou mā te Kōti Whenua Māori tētahi Whakahau Noho e whakamana – ko tōna tikanga mā David anake ngā āhuatanga o te whenua e whakahaere.

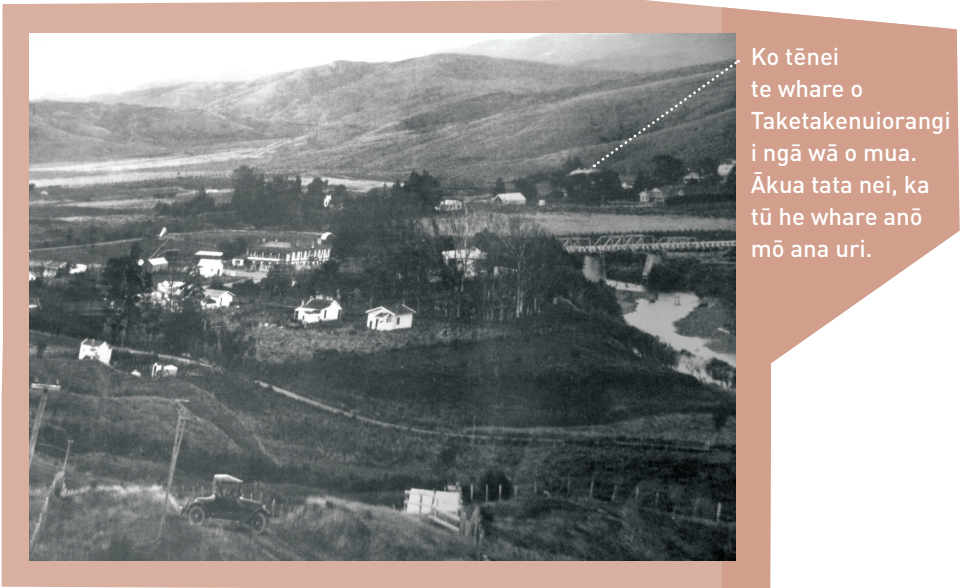


Kua tokomaha tonu ngā tāngata e whai pānga ana ki te whenua, arā, ko ngā uri katoa o ēnei tāngata tokowhā.



I ngā tau o mua i hauruatia te papa kāinga nei – kia kotahi ai te haurua ki a Henare rāua ko Te Uira, kia kotahi anō ki a Te Kākaho rāua ko Te Ata Hikoia. Nā, ko te whenua i riro i a Te Kākaho rāua ko Te Ata Hikoia te whenua e kōrerohia ana.

Ko te whare e whakaarotia ana, he wharenuī. Ahakoa he wharenuī kei te marae, he whare anō tēnei mō te whānau tata, arā, mō ngā uri o Taketakenuiorangi.



Kua tīmata te whakarite i te āhua o te taiao. Kua karakiatia te whenua, kua taiapangia tētahi wāhi tapu, kua whakatōngia ngā rākau māori huri noa i te whenua. Kua nehua kētia ngā pito me ngā whenua o ngā mokopuna tokowhā o te whānau ki te whenua nei. Ahakoa kei te tāone kē ngā mātua e noho ana, ka mōhio tonu ngā tamariki kei hea ake ō rātou whenua e tanu ana, ka mōhio ko hea tō rātou tūrangawaewae, kua pai te hokihoki ki reira. Ā tōna wā anō pea ka nuku ētahi ki reira noho ai.



Kua whakaarahia ake anō hoki te puna wai o ngā tūpuna. He wai māori, he wai ora. Heoi anō, kua paruparu te puna wai i ngā kararehe pāmu, me te turakanga o ngā rākau e karapoti ana i te puna. Ko tētahi atu raruraru, i te raumati ka mimiti katoa te wai, ko te paru anake e toe ana. Nā reira, he mahi nui ki te whakapai ake i te puna wai e taea anō ai ōna wai te inu. Heoi anō, kua whakawhiti kōrero a David rāua ko tētahi tangata pūkenga, ā, mā rāua e whiriwhiri, e whakatau me pēhea te whakaora mai anō i te puna wai.



Te ātaahua hoki
o ngā puna wai
o ngā tūpuna.

Kei te hiahia a David ki te hanga i tōna whare ki te tākakau me te uku. Kei te rangahau tonu rāua ko Sally i ngā mātauranga e pā ana ki tēnei. Ki tā David, he roa te hātepe hei hanga i te whare, he taumaha hoki. Engari mā te tokomaha o Rangiwakaangi, ka taea.

Ka whakamātātia te tākakau kia mataono noa te hanga. Ka apoapohia ngā pūtoi tākakau hei pakitara. Ka pania atu te uku me te oneone hei kiri mō ngā pakitara.

Kua āta whakaarohia anō ngā matū, ngā rawa e tika ana hei tauārai mō te tuanui. Ko te raupō, te kuta, me te wīwī ngā otaota pai e ai ki te rangahau. He pai ēnei rawa hei ārai wai, he rawa whakahou hoki.



Kua oti kē te kī i runga ake nei he whare puni te āhua o te whare ka hangaia. I pērā ai kia taea e te tokomaha te hoki atu ki reira noho ai. Ko te rūma rarau te arotahi o te whare, te wāhi e karapinepine ai te whānau. Ka whakamahia hei wāhi hui, hei wāhi moe, hei wāhi ngahau, hei whare wānanga, hei wāhi mō te tūpāpaku hoki.

Kei te anga te mata o te whare ki te raki, ā, e karapotitia ana e te mahau, he wāhi anō kei waho mō te noho. He māmā te hoahoa, kia māmā ai te hanga.

Mā te rangahau, whakaritea ētahi atu āhua hei whakaaro mā David rāua ko Sally. Tuhia te hoahoa o tēnei whare.

He Kupu Taka

hauhā	<i>carbon dioxide</i>
haumata	<i>alpine grass</i>
hauropi	<i>ecology, ecological</i>
huangō	<i>asthma</i>
inaki	<i>thatch</i>
kaihoahoa whare	<i>architect</i>
kaiwhakarākei	<i>decorator</i>
kaiwhakarite mahi	<i>project manager</i>
koiora	<i>biology, biological</i>
kōmaru	<i>solar</i>
kounga	<i>quality</i>
mauroanga	<i>durability</i>
matea/hiahia	<i>need</i>
parakino	<i>pollutant</i>
pōkākā	<i>heat</i>
pūnaha	<i>system</i>
pūnaha whakawhitinga pōkākā	<i>mechanical ventilation system</i>

pūtoi	<i>bales</i>
rawa whakahou	<i>renewable resource</i>
ruapara	<i>landfill</i>
tākakau	<i>straw</i>
taiao whenua	<i>physical (land) environment</i>
taiwhenua	<i>district</i>
taiao whakaako	<i>learning environment</i>
takurua	<i>winter</i>
tāoke	<i>toxin</i>
tauārai	<i>insulation</i>
tōtika ā-mahi	<i>efficient technique</i>
tōtika ā-utu	<i>cost efficient</i>
tukurua	<i>recycle</i>
whakahanumi	<i>mix</i>
whakamātā	<i>heap up, layer</i>
whāomo	<i>preserve</i>
whiu para	<i>waste disposal</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 Mōhiotio, ko Ngā Hanga me ngā Pūhanga Manawa, ko Te Tāhiko me te Hangarau Whakatina, 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 rūa 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 rongoā, 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 ko 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.

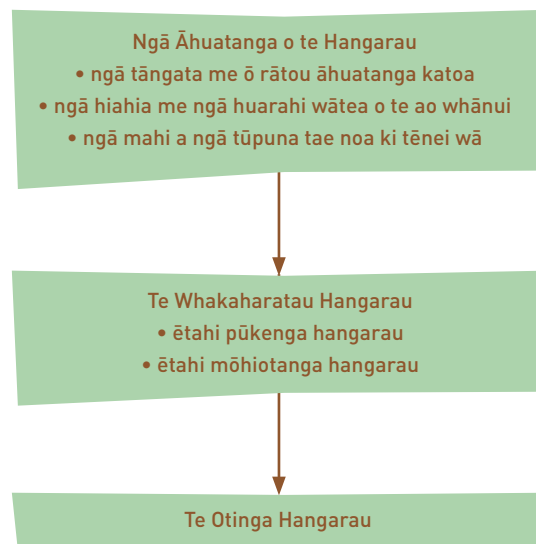
Te Whakaharatau Hangarau

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.

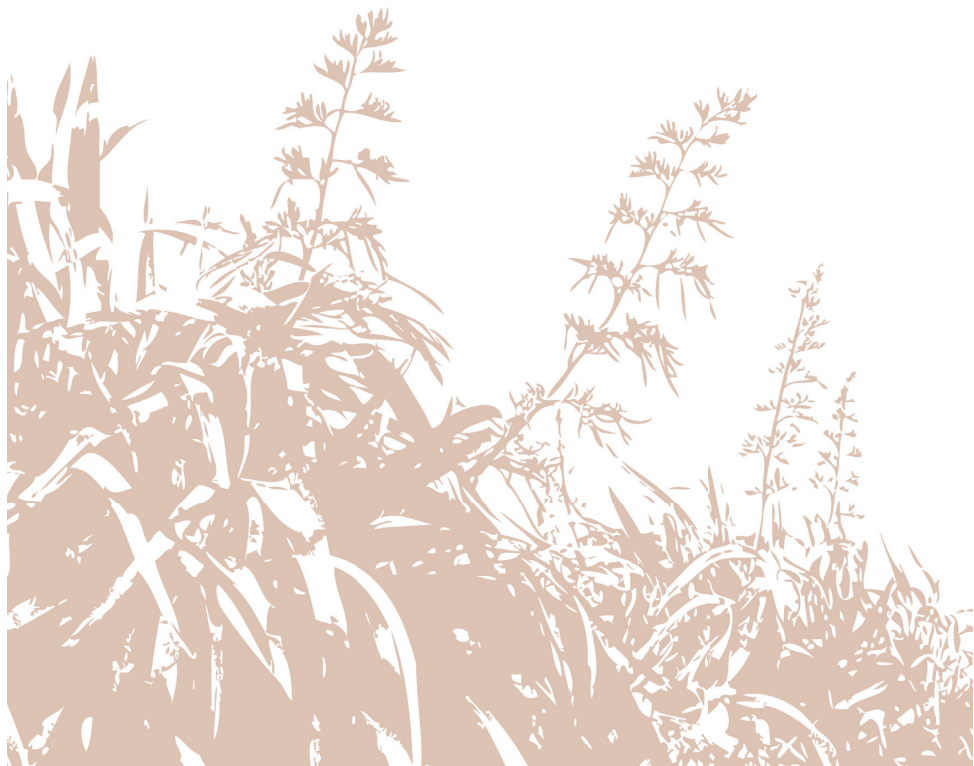
Te Whakawhanaketanga o te Otinga Hangarau

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 kōtuitui kē te mārama haere ki ngā āhuatanga matua o te hangarau me te whakaharatau hangarau, e puta ai te otinga hangarau ā tōna wā.

Te whakawhanaketanga o te otinga hangarau

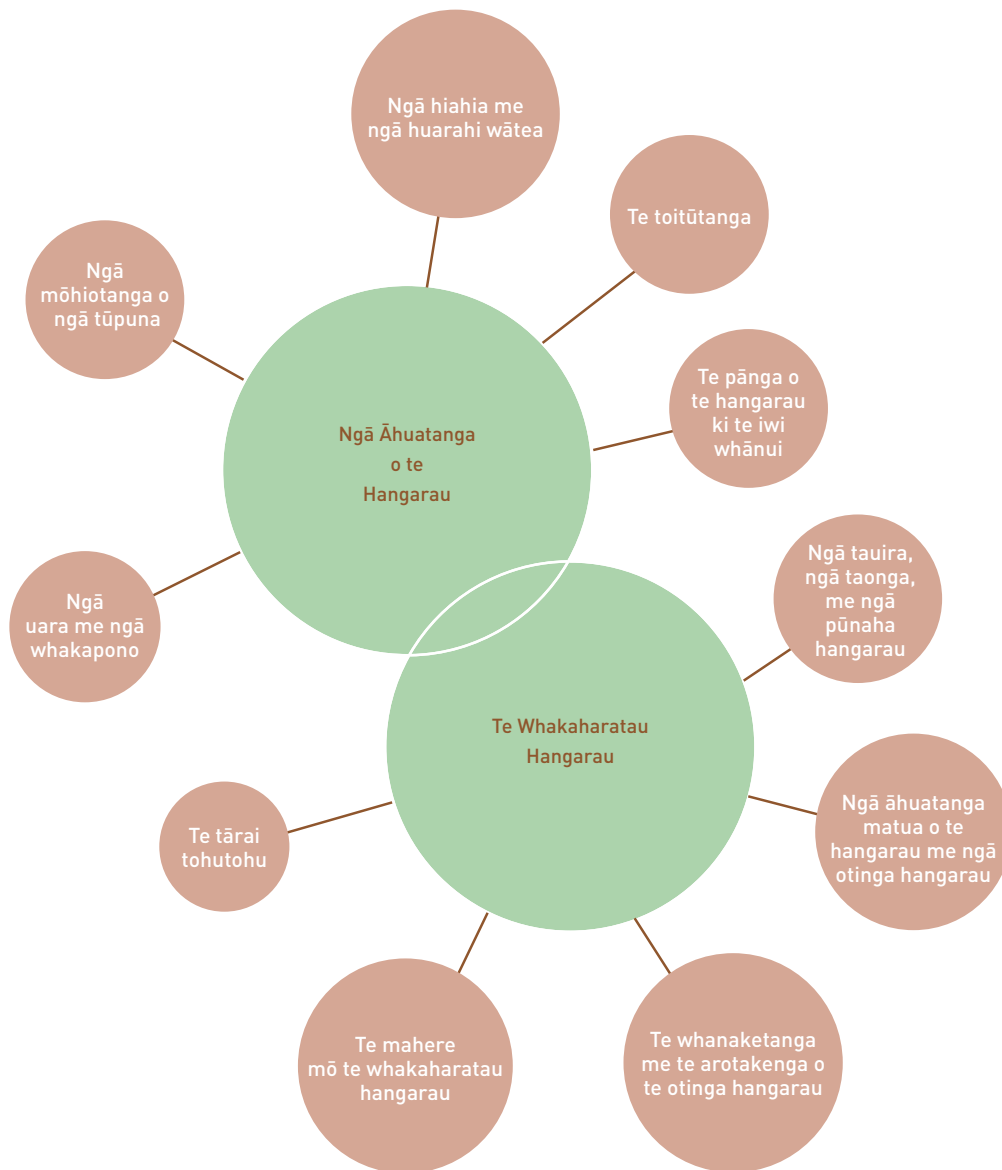


Kei te whakaatu tēnei tauira o te whakawhanaketanga otinga i te tukanga hangarau e puta ai he otinga hangarau. E whakaataria ana anō hoki tēnei i te anga e whai ake nei.



Te Anga Whakaū Māramatanga ki te Tukanga Hangarau

Ngā āhuatanga māramatanga ki te tukanga hangarau



He Kupu Taka

āhuatanga māramatanga ki te tukanga hangarau	<i>characteristics/features for understanding the technological process</i>
āhuatanga matua	<i>key characteristics/features</i>
arotakenga	<i>evaluation</i>
ngā hiahia me ngā huarahi wātea	<i>needs and opportunities</i>
ngā mōhiotanga o ngā tūpuna	<i>knowledge tūpuna have</i>
ngā tauira, ngā taonga, me ngā pūnaha hangarau	<i>technological models, products, and systems</i>

otinga hangarau	<i>technological outcome</i>
pānga ki te iwi	<i>impact on society</i>
tārai tohutohu	<i>brief development</i>
toitūtanga	<i>sustainability</i>
uara	<i>values</i>
whakaharatau hangarau	<i>technological practice</i>
mahere	<i>plan</i>
whakapono	<i>belief</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 Te Kura Tuarua o Alfriston. 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 hanganga o taua kura.

He aha te otinga i tūmanakotia kia puta mō ngā ākongā?

He aha ngā hiahia o ngā ākongā?

- I āta tautohua aua hiahia?
- He aha i mōhio ai ngā kaitārai tohutohu ki ēnei mea e matea ana e ngā ākongā?

He aha ētahi o ngā huarahi i wātea kia whāia? Me whai whakaaro anō ki te pito whenua me te rōnaki o te whenua.

- I pēhea tā rātou whakamahi i te āhua o te whenua hei painga mō te kura?
- He aha ētahi o ngā mea ka taea i te kura hou kāore e taea ana i ētahi atu kura?

Ka pēhea te āhua o te whakapuakitanga huatau? Āta whakaarohia ngā mahi kia mahia, ā, he aha i whakatauria ai kia pērā te mahi.

He aha ētahi o ngā whakatakotoranga whāiti? Me whai whakaaro ki te whakahoutanga o te hau takiwā i ngā akomanga i ia 6 hāora. Whakaarohia ngā whaitua rahi tonu, raha tonu o roto, me ngā whaitua rahi o waho e taea ana te whakamahi hei wāhi ako.

Mō te wāhi ki te taiao o te kura, i reira kē te wai mō te roto?

- Mēnā karekau, he aha rātou i pīrangi ai kia takoto mai he roto?
- Me pēhea anō te waihanga i te roto?

Ka uru mai ki te taiao pāpori ngā mea pērā i ngā matatika, ngā āhuatanga tōrangapū, ngā āhuatanga ahurea me te ōhanga.

- He aha ngā āhuatanga ohaoaha ka pā ki te hanganga o te kura mēnā e tino kaha ana, e tino ngoikore ana rānei ngā mahi waihanga whare i te hāpori whānui?
- Ka pēhea mēnā e kaha rerekē ana te ahurea o te hāpori i te ahurea o te kura?

He Kupu Taka

arotakenga	evaluation
hunga whai pānga mai	stakeholders
otinga e tūmanakotia ana kia puta	desired outcome
raha	open
taiao pāpori	social environment
taiao tūturu	physical environment

tautohu	identify
te hiahia, te huarahi rānei e wātea ana	need or opportunity
tohutohu	brief
whakapuakitanga huatau	conceptual statement
whakatakotoranga whāiti	specifications

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 tiroiro 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 Kura Tuarua o Alfriston me te whare o Rau i Whangaruru. E rua, e rua, nā Rau tonu i hoahoa.

- Ki ō whakaaro, he rerekētanga anō kei waenga i ngā mahi whakariterite mō ēnei whare e rua?
- Kotahi anō te kāhui mātāpono mahere i whāia e Rau mō ngā whare e rua?
- Āta whiriwhiria ngā āhuatanga i ōrite, i rerekē rānei i roto i ngā mātāpono me ngā mahi whakariterite mō te kura me te whare tūmataiti.

Ka pēhea ngā mahi whakariterite mō tētahi whare i hangaia ki te uku me te tākakau i te tīmatanga o tērā rautau?

- He kaitātai ataata anō ā rātou?



- He aha ngā momo taputapu mahere tērā pea i wātea ki te hunga hoahoa i tērā momo whare i ērā wā?

Tūhuratia ngā taputapu mahere kua whakahuatia i runga ake nei.

- He taputapu atu anō kāore i whakaingoaia?
- Whiriwhiria ko ēhea ngā taputapu mahere tērā pea i whakamahia, ka taea rānei te whakamahi hei hanga i te whare uku, i te whare o Rau i Whangaruru, i Te Kura Tuarua o Alfriston, me te wharenuī o David.

I konei, e kimi ana koe mēnā e hāngai pū ana te taputapu ki te mahi. Tēnā tuhia he tūtohi kia pēnei te āhua:

Te kaupapa	Te taputapu mahere	Te hāngai ki te mahi
Te whare uku, tākakau		
Te whare o Rau		
Te Kura Tuarua o Alfriston		
Te wharenuī o David		

Hei āwhina i a koe ki te whakakī i tēnei, pātaihia te pātai e whai ake nei: He aha i noho ai koinei te taputapu tino pai rawa atu mō tēnei kaupapa?

He Kupu Taka

e hāngai pū ana ki te mahi	<i>fit for purpose</i>
hautaka huritao	<i>reflective journal</i>
hoahoa ripo	<i>flow diagram</i>
kaitātai ataata	<i>graphical organisers</i>
mahere hinengaro	<i>mind maps</i>
mahere pakari	<i>robust plan</i>
mahere tāwariwari	<i>flexible plan</i>
mahere whakatutuki	<i>plans of action</i>

ohia manomano	<i>brainstorming</i>
pukapuka kohinga kuha	<i>scrapbooks</i>
tahua whakaaro	<i>idea banks</i>
taputapu mahere	<i>planning tool</i>
tikanga hoahoa	<i>diagramming technique</i>
tikanga whakakaupapa	<i>structuring technique</i>
tūtohi Gantt	<i>Gantt charts</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.

Āta whakaarohia te whare i hangaia ki te uku me te tākakau.

- Kua pēhea tā rātou whakahou haere, whakatika haere i ā rātou mahere i ērā wā?
- Kāore hoki i wātea ki a rātou te mahi whakaaritanga ā-rorohiko, engari ka pēhea te hanga tauira pakupaku?
- Ki tō mōhio, he aha rātou i mōhio ai ka ea katoa ngā hiahia e tika ana i tā rātou e hanga ana?
- Whakamāramatia mai ngā mahi whakamātau tērā pea i whāia e rātou.
- Āe rānei i rerekē ō rātou hiahia i ērā atu tātanga e hanga whare ana?

Kāore anō a David kia tīmata ki te hanga i tōna wharenuī.

- Ko tēhea o ngā otinga waenga e tika ana kia whāia e ia e mōhio pū ai ia kei te huarahi tika ia?
- He aha koe i kōwhiri ai ko tērā?

Āta whakaarohia Te Kura Tuarua o Alfriston, me te kaihoahoa, a Rau.

- Ki tō mōhio, kua whāia e ia te otinga waenga kotahi mō ēnei kaupapa waihanga e rua?

Me whai whakaaro anō mēnā he taonga, he pūnaha rānei, ko ngā mea e rua rānei ka taonga ake i ēnei kaupapa e rua.

Tuhia he tūtohi kia pēnei te āhua:

Te kaupapa	Ngā otinga waenga	He taonga, he pūnaha rānei, ko ngā mea e rua rānei?
Te whare uku		
Te whare o Rau		
Te Kura Tuarua o Alfriston		
Te wharenuī o David		

He Kupu Taka

e hāngai pū ana ki te mahi	<i>fit for purpose</i>
rangahau mēnā ka taea	<i>feasibility study</i>
takahanga whakamātau	<i>trialling</i>
tauira pakupaku	<i>scale model</i>
tauira taketake	<i>prototype</i>
tohutohu kua oti te tārai	<i>formalised brief</i>

whakaahua hukihuki o te huatau	<i>concept sketches</i>
whakaaritanga ā-rorohiko	<i>computer simulation</i>
whakaaro auaha	<i>creative thinking</i>
whakamaunga	<i>ultimate endpoint</i>
whanaketanga me te arotakenga o te otinga hangarau	<i>development and evaluation of technological outcomes</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 āhei o te tangata ki te huri i ngā matū, i ngā pūngao, me ngā mōhiōhio.

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 kawea 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 hapori 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 whare e kitea ana i te kōpae ataata mō tēnei kaupapa 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 ngā hanga nei ki te āhua o tā tātou noho, o te noho rānei a ētahi atu ki te ao?

- He tāngata tonu kei te kōkiri i te kaupapa?
- E hono tahi ana te kaupapa ki ētahi āhuatanga pāpori, ki ētahi āhuatanga ahurea?
- Kimihia te tikanga o tēnei kōrero, ka whakahāngai ai i te whakamāoritanga ki tēnā, ki tēnā whare.
- Mō te wāhi ki Te Kura Tuarua o Alfriston, he hiahia pāpori te hiahia o te hāpori ki tētahi kura hou. Ko te whai kia ngata ngā hiahia o ngā ākonga e haere ana ki te kura, he hiahia ahurea.

He māmā te kite iho i āta whāia he tukanga hoahoa mō Te Kura o Alfriston. I pērā anō te āhua mō te whare uku, ki ō whakaaro?

Arā ētahi tauira o te whakaaro arohaehae i roto i te hanganga o Te Kura o Alfriston. Matapakihia ēnei.

- Kimihia te roanga atu o ngā kōrero mō ēnei mea e rua:
 - āe rānei ka taea, ka tutuki te kaupapa?;
 - āe rānei ka paingia, ka pīrangitia e te iwi nui tonu?

Whakahāngaitia ēnei pātai ki te kaupapa nei mō ngā whare tautaiāo.

- Me pēhea koe e mōhio ai mēnā ka tū tonu, ka tōtika tonu tētahi hanga, ahakoa pēhea?



- Ka pūmau tonu tana mahi tika i te mahi?
- Ka pēhea te whiriwhiri mēnā e taea tonutia ana te kaupapa?
- Ka mahi tonu ia i te mahi e tika ana ahakoa anō ngā here, ngā whakararu tērā ka pāpā mai? (Hei tauira, ka tutuki tonu te kaupapa ki te tino taumaha ngā utu waihanga?)

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.

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 kitea pea!

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 pūkenga.	

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. Whiriwhiria mēnā e eke ana i ngā whare tautiaio ngā paearu kua whakaritea mō tēnā, mō tēnā.

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. Whakaarohia tēnei mō te wāhi ki ngā whare tautiaio, ka whiriwhiri mēnā he taonga, he pūnaha rānei te whare, ko ngā mea e rua kē rānei.

Āta whakaarohia ngā āhuatanga ōkiko me ngā āhuatanga whakatinana o ngā otinga hangarau o tēnei kaupapa. 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. Me tīmata mai pea i te whare uku, kātahi ko Te Kura Tuarua o Alfriston.

Hei tauira, whāia tētahi ara whakaaro pēnei nā:

He mea hanga te whare uku ki _____, kia tū ai _____, nā runga i te hiahia o ngāi tauwi i tērā atu rautau ki _____, mā _____. Whakakīia ngā wāhi wātea ki ēnei kōrero:

- te pātītī, te uku/paru, me te wai;
- hei whare pakari tonu, hei papare atu i ngā kino o Tāwhirimātea;
- te whare, te whakaruruhau pūmau mō rātou;
- kia noho āhuru ai rātou, kia pai ai tā rātou noho ki te ao.

He Kupu Taka

āhua taha ōkiko	<i>physical nature</i>
āhua taha whakatinana	<i>functional nature</i>
āhuatanga ahurea	<i>cultural features</i>
āhuatanga matua	<i>key characteristics/features</i>
āhuatanga ōkiko	<i>physical properties</i>
āhuatanga pāpori	<i>social features</i>
āhuatanga whakatinana	<i>functional properties</i>
hāpori hangarau	<i>technological community</i>
huatau hoahoa	<i>design concept</i>
huri i ngā matū, i ngā pūngao, me ngā mōhiotio	<i>transform materials, energy, and information</i>
ka paingia, ka pīrangitia	<i>desirability</i>
kawenga	<i>activity</i>
mahi	<i>function</i>

mahi i whakaritea māna	<i>fit for purpose</i>
mariko	<i>virtual</i>
matarua	<i>dual nature</i>
matauranga hangarau	<i>technological knowledge</i>
otinga hangarau	<i>technological outcome</i>
pūnaha hangarau	<i>technological system</i>
taonga hangarau	<i>technological product</i>
tūātinini	<i>complex</i>
tukanga hoahoa	<i>design process</i>
wāhi e tika ana	<i>in situ</i>
wānanga taha painga	<i>practical reasoning</i>
wānanga taha whakatinana	<i>functional reasoning</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 kauwhiri 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 tuhinga 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 whakatauiranga: ko te whakatauiranga kawenga, me te hanga tauira taketake.

Ko te whāinga o te whakatauiranga kawenga, he torotoro, he arotake i tētahi huatau hoahoa, nō reira ka kaha te whāia o tēnei momo whakatauiranga 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 whakatauiria 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 whakatauiria 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 whakatauiria kawenga, nā runga i ngā whakatau ka puta ake i te whakatauiria 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 te whare tautiaiao.

- He aha ki ō whakaaro ngā mahi whakatauiria i whāia mō Te Kura Tuarua o Alfriston?
- He aha te take me mātua kawhe he mahi whakatauiria?
- Ko te whakatauiria taha whakatinana, ko te hanga tauira taketake rānei te mea e tino hāngai ana?
- He aha ngā take i whāia ai tēnā me tēnā momo?
- Kotahi anō te momo whakatauiria e rite ana mō te hanganga o tētahi kura?

Whakakīia te tūtohi e whai ake nei hei whakaatu i te momo wānanga e whakaaro ana koe i noho tūāpapa mai ki ngā mahi whakatauiria mō te hanganga o te kura.

Te momo whakatauiria	Te wānanga taha whakatinana	Te wānanga taha painga
Te whare uku		
Te whare o Rau		
Te Kura Tuarua o Alfriston		
Te wharenuī o David		

He wā anō, ki ō whakaaro, i tūpono ai rātou ki tētahi raruraru i whāmutua ai te kaupapa, i kuhuna ai rānei ētahi whakarerekētanga nui? Whakaahuatia ēnei raruraru.

Ka pēhea te wāhi ki te whare uku? He aha te momo whakatauiria i whāia i ngā rā o nehe, i mua i te aranga ake o ngā hangarau o ēnei rā? He aha te momo whakatauiria e tika ana hei whai mā David? I ēnei tauira e rua, āta whakaarohia te wānanga taha whakatinana me te wānanga taha painga e noho tūāpapa mai ana ki te momo whakatauiria e whakaaro ana koe i whāia, e tika ana rānei kia whāia.

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 āhuatanga 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 āhuatanga 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 āhuatanga 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 porowhiuwhiu taonga.

Kia hoki ake anō ki ngā kōrero mō te whare tautaiāo.

- He aha ngā taonga hangarau? Me whai whakaaro ki ngā mahi a te tangata, ki te hoahoa, me te mātauranga e noho tūāpapa mai ana ki te whakamahinga o ngā matū.
- Whakaarohia ngā āhuatanga o ngā matū ka whakamahia, me te āhua o te whakamahia. He mea nui anō te whakatina i ngā rawa i roto i te hanganga o tēnei taonga?

Ngā pūnaha hangarau

Ko te pūnaha hangarau, he huinga wāhanga e hono tahi ana, ko tāna mahi, he huri, he pupuri, he kawea, 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 mārama ki ngā mea ka whakaurua, ngā putanga, ngā tukanga hurihanga, me te whakatina. Ko te mārama 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 ariā 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 haumarū, 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 tēna, 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 i whāia he tukanga hangarau i ētahi o ngā takahanga waihanga i Te Kura Tuarua o Alfriston. Tērā pea i whai wāhi mai he pūnaha hangarau ki te mahinga o ētahi o ngā rawa hei hanga i ngā whare. Ka pēhea te pūnaha whāhauhou?

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?

Ko tētahi mahi pai e mārama ai koe ki te āhua o te pūnaha hangarau, ko te kōwhiri i tētahi pūnaha whakanao, me te tiroiro mēnā e rite ana ngā āhuatanga katoa e rārangi ake nei. Kaua e wareware, ko te otinga hangarau te hua o te whakaharatau hangarau. Tīpakohia tētahi kaupapa e pārekareka ana ki a koe, ka whai haere i ngā takahanga whakawhanake. Ki te tūpono koe ki tētahi mea kāore e tino mārama ana, tēnā rangahaua.

Kāore e kore kua rongo koe i ngā kōrero mō te pouaka pango ka āta kimihia e ngā kaitūhura ina aituā he waka rererangi.

- Rapua ngā kōrero e mārama ai koe he aha i noho taonga ai taua pouaka pango ki a rātou.
- He pouaka pango anō tō ngā waka haere huarahi?
- Ka rongo kōrero anō koe mō ngā kaitūhura e kimi ana i te pouaka pango o te motukā?
- Ka pēhea ērā atu momo waka kawekawe tāngata?

He Kupu Taka

āhuatanga o te pūnaha hangarau	<i>features of a technological system</i>
e uru mai ana he matū, he pūngao, he pārongo rānei	<i>involving materials, energy, or information</i>
hangarau matū	<i>materials technology</i>
he mea anō ka puta mai	<i>has outputs</i>
he mea anō ka whakaurua atu	<i>has inputs</i>
hoahoa tangata	<i>human design</i>
huatau hoahoa	<i>design concept</i>
huatau whānui	<i>generic concept</i>
huinga wāhanga e hono tahi ana	<i>set of interconnected parts</i>
huringa taonga	<i>product life cycle</i>
kākahu aro ki te pāmahana	<i>heat regulated clothing</i>
kauawhi whānui	<i>holistic</i>
kei konā ōna anō tukanga panoni	<i>has transformation processes</i>
kei konā ōna anō tukanga whakatina	<i>has control processes</i>
mariko	<i>virtual</i>
matū "ihumanea"	<i>SMART materials</i>
mea whakaurua	<i>input</i>
mōwhiti aro ki te aho	<i>light responsive sunglasses</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>
ngā tauira, ngā taonga, me ngā pūnaha hangarau	<i>technological models, products, and systems</i>
papanga ka horoi i a ia anō	<i>self cleaning textile</i>

piki kawenga	<i>redundancy</i>
porowhiuwhiu taonga	<i>product disposal</i>
pouaka pango	<i>black box</i>
pūnaha	<i>system</i>
pūtanga	<i>output</i>
rawa māori	<i>raw material</i>
taonga hangarau	<i>technological product</i>
taonga matū	<i>material product</i>
taputapu whakawhanake matamua	<i>key development tool</i>
taura taketake	<i>prototype</i>
taunakitanga	<i>evidence</i>
te mahi i whakaritea māna	<i>fitness for purpose</i>
toitūtanga	<i>sustainability</i>
tōtika o te mahi	<i>reliability</i>
tūāpapa mātauranga hangarau tōna	<i>identified technological knowledge base</i>
tukanga hurihanga	<i>transformation process</i>
uaua horihori	<i>artificial muscle</i>
wānanga taha whakatinana	<i>functional reasoning</i>
wānanga taha painga	<i>practical reasoning</i>
whāhauhau	<i>air conditioning</i>
whakanao	<i>production</i>
whakanao manomano	<i>mass production</i>
whakatauiria hangarau	<i>technological modelling</i>
whakatauiria kawenga	<i>functional modelling</i>
whakatina	<i>control</i>

Ngā Āhuatanga 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.

Ina whakaarohia ake ngā kōrero mō Te Kura Tuarua o Alfriston, i hangaia te kura i te mea kua kī katoa ērā atu kura tuarua o taua rohe kua kore he wāhi e wātea ana ki ngā taiohi e noho ana i te takiwā o Alfriston. Nō reira ko te hiahia tūturu o ngā ākonga, ko tētahi kura tonu, he wāhi e haere ai rātou ki te ako. Ko te huarahi i wātea, ko te āhei ki te whakaaro rerekē, ki te whakaaro korokē ki te āhua o te hanga me te takoto o te kura.

- He aha ētahi o ngā āhuatanga i rerekē ngā whakaaro i puta mō aua mea i Te Kura Tuarua o Alfriston?
- He aha te take i puta ai he whakaaro rerekē mō tēnei o ngā kura?



- He aha ētahi āhuatanga ka whai hua tonu pea te puta o te whakaaro rerekē, o te whakaaro korokē ki aua mea?
- He aha ētahi mahi hei āta mahi māu kia whaikiko ai ō whakaaro korokē, kia kore ai e kīia he hauwarea, he rorirori?

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 orange, hei pārekarekatanga mā ngā uri whakaheke. I te wā ki ngā tūpuna, arā ngā tikanga pērā i te rāhui hei toitūtanga i ngā rawa māori. He tikanga pai te rāhui e whakatina ai, e penapena ai ngā iwi i ā rātou rawa.

Āta whakaarohia te whare i hangaia e Rau Hoskins i Whangaruru, i kuhuna ai he papa kōmaru ki te tuanui.

- He aha ki ō whakaaro ngā take toitūtanga i whiriwhiria e rātou?
- He aha i hira ai ēnei āhuatanga, ina whakaarohia te wāhi kei reira te whare o Rau (arā, kei tētahi moutere)?

Whakaarohia te whare uku i te Teihana o Molesworth, i hangaia i te tau 1866. He mea hanga tērā ki te oneone, te uku me te tākakau.

- He aha ngā āhuatanga toitūtanga hei whiriwhiri mā ngā kaihanganga i tērā momo whare i ērā wā?
- Koirā anō ngā take toitūtanga ka arohia nuitia ina hangaia he whare ki te uku i ēnei rā?

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 tau iwi. Ka mutu, i āta haere kōturi ērā āhuatanga me te taha wairua.

I te kōpae ataata ka kōrero a Rau Hoskins mō te wai māori me te wai ora.

- He aha te mea tuatahi ka kimihiā e ngā tūpuna i a rātou ka tahuri ki te hanga whare hou?
- He aha rātou i mōhio ai ko tēhea te wai māori, ko tēhea te wai ora?

Ngā uara me ngā whakapono

I haere kōturi anō ngā mōhiotanga, ngā pūkenga me ngā māramatanga o ngā tūpuna ki ō rātou uara me ō rātou whakapono. E karapotia 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 David e kōrero ana mō te hanga whare ki tōna papa kāinga, he aha ētahi o ngā uara me ngā whakapono i kōrerotia e ia?

- He aha ōna whakaaro mō te tanu i te pito o tana tama ki tō rātou whenua tūpuna?

- He aha a David i kore ai e whakaaro ki te whakatū i tana whare ki te tāone tonu o Waipukurau (kei reira hoki ētahi o tana whānau e noho ana)?
- He mea nui kia karakiatia te whenua. He aha ai?
- He aha a David i whakapau kaha ai ki te whakaora i te puna wai o ana tūpuna (tē tahuri noa ai ki te hanga kōpapa wai kia whakakīia e te taraka kawē wai)?

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?

Mō te wāhi ki Te Kura Tuarua o Alfriston, ko te pānga nui ki ngā ākonga me ō rātou whānau, kua tū mai he whare e haere ai rātou ki te ako mō te 6 hāora mai i te Mane ki te Paraire.

- He pēhea te pānga o tēnei ki te whānau? (Kua kore ngā ākonga e noho ki te kāinga i aua rangi.)

Mō ngā kāinga e piri tahi ana ki ngā taitapa o te kura, kua kore rātou i piri tahi ki ngā whare tūmataiti takitahi. Kua piri tahi kē ki tētahi pito whenua nui tonu, me ōna anō whare āhua rahi tonu. Mō ētahi o aua kāinga, he papa tākaro kē pea te kainga kanohi.

- He pēhea te pānga o tēnei ki ngā whānau nō rātou aua kāinga?
- Kua pai pea tā rātou whakamahi i ngā papa tākaro hei tākaro i te whutupōro pā i ngā rangi whakatā.

Mō ngā tāngata e noho ana ki te takiwā o Alfriston, kua noho mai he pūnaha kawē tāngata, he pahi pea, hei mau mai i ngā ākonga ki te kura, hei whakahoki anō i a rātou ki ō rātou kāinga. Ko ngā waka kawē tāngata tētahi āhuatanga o te anga, o te pūnaha rānei ka takoto hei whakahaere i te tāone. Ko ētahi atu tino āhuatanga o tēnei tūmomo anga, ko ngā pūnaha parakaingaki, ko ngā ara hīkoi, me ngā ara haere waka, tae atu ki ngā ratonga pērā i te kōhi rāpihi me te tahitahi huarahi.

- He pēhea te pānga ki ngā ara?

Ka nui ake ngā waka e haere ana i ētahi o ngā huarahi, i te mea ko ngā mātua ērā e hari ana i ā rātou tamariki ki te kura, ko ngā taiohi tonu rānei e taraiwa ana ki te kura mā runga waka. Ka maha ake anō hoki ngā paihikara haere i te huarahi.

- He aha ngā rerekētanga kia mahia ki ngā ara e pai tonu ai te rere o ngā waka, o ngā paihikara, o ngā tāngata i te huarahi?

Tērā pea ka tūtū mai he toa hou i te takiwā o te kura.

- He aha te pānga ki te tāone, mēnā he tāone e pātata ana ki te kura? Ka pēhea ngā toa hoko i ngā kaka mō te kura, me ērā e hoko ana i ngā pukapuka, i ngā taputapu tuhituhi, i ngā kaka hākinakina rānei?

- Āe rānei me noho pātata tonu ēnei tūmomo toa ki te hapori? Ka pēhea mēnā 10 km te tawhiti atu o aua toa nei, arā, i tētahi papa hokohoko nunui?

Ko te tikanga, ina tū mai he kura ki tētahi takiwā, kua puta he pānga ki te anga whakahaere e pātata ana ki te kura me te hapori e noho tata ana ki te kura.

Te Aromatawai

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

Paerewa Paetae 90046 (hei tauira)

Te whakatauiria i tētahi tohutohu hei whakautu i tētahi take.

Paearu Paetae

1. Te tautuhi i ngā pūtaka matua me ō rātou whakataunga here e pā ana ki tētahi take tuku.

2. Te whakamahi i ngā pūtaka matua hei tautuhi i ngā hiahia me ngā mea angitu e whakaarotia ana.

3. Te whakatauiria i tētahi tohutohu hei whakautu i tētahi hiahia, mea angitu rānei kua kōwhiria me ngā tino whakataunga here o ngā pūtaka matua kua tautuhia.

4. Te whakataka tuatahi i ngā pūtaka matua, me te whakamārama i ō rātou whakataunga here me ngā whakawhitiwhitinga matua e pā ana ki tētahi take tuku.

7. Te whakataka tuatahi i ngā pūtaka matua, me te whakamārama i ō rātou whakataunga here me ngā whakawhitiwhitinga, kātahi ka whakamāramatia ai te whakataka tuatahitanga me ngā pānga ki tētahi take tuku.

8. Te whakamahi i ngā pūtaka matua kua whakataka tuatahitia hei whakamātau i ngā hiahia me ngā mea angitu e whakaarotia ana.

9. Te whakatauiria i tētahi tohutohu e āta whakamārama ana i ngā āhuatanga katoa hei whakatau i tētahi take tuku.

Paetae	Kaiaka	Kairangi

5. Te whakamahi i ngā pūtaka matua kua whakataka tuatahitia hei tautuhi i ngā hiahia me ngā mea angitu e whakaarotia ana.

6. Te whakatauiria i tētahi tohutohu hei whakautu i tētahi hiahia, mea angitu rānei kua kōwhiria me ngā whakataunga here o ngā pūtaka matua kua whakataka tuatahitia.

Paerewa Paetae 90046 Te whakatauiria i tētahi tohutohu hei whakautu i tētahi take

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 tārai tohutohu e hāngai ana ki tētahi take. Ko te kaiaka e tohu ana kua neke atu i tērā te pai o tō kawae 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 take/kaupapa
- te tautohu i ngā āhuatanga matua, me te pānga mai o ēnei ki te take/kaupapa
- te whakamahi i ēnei āhuatanga matua ki te tautohu i ngā hiahia me ngā huarahi e wātea ana
- te tuitui i ēnei āhuatanga katoa hei tuhi i ngā tohutohu.

Mō te paerewa paetae 90046, 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. Ko tētahi wāhanga o te anga, ko Te Tārai Tohutohu. Kei reira ngā kōrero mō ngā mea hei āta whakaatu māu i roto i ngā tohutohu. Ka whaihua tonu pea tō hoki atu ki ngā pātai kua tohua ki te tohumatā i te wāhanga kauruku, ka āta whiriwhiri ai. Mā konei e taea ai e koe te hanga whakautu e hāngai ana ki tēnā, ki tēnā paearu i te paerewa paetae.

Hei tauira

Ngā paearu	Ngā whakautu ki ngā pātai kua noho rārangi mai ki te anga
Te kōwhiri i tētahi take/kaupapa	Kia hangaia he kura hou
Te tautohu i ngā āhuatanga matua	Te rahi o te pito whenua ki reira tū ai te kura Te tokomaha o ngā ākonga Te maha o ngā whare
Ngā pānga o ngā āhuatanga matua ki te kaupapa	Ngā mahi ka mahia i ngā whare o te kura me ngā whenua
Te tautohu i ngā hiahia me ngā huarahi e wātea ana	Te whai kia hangaia te whare i runga anō i ngā tikanga whāomoomo me ngā tikanga toitū
Te tuitui i ngā paearu me te tuhi ki ngā tohutohu, ka whakamahi ai i te rārangi ka oti mai hei tohu haere mēnā e tutuki ana ngā paearu	

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

- te whakaraupapa i ngā āhuatanga matua
- te whakamārama i ngā pānga me ngā whakawhiwhitinga matua e pā ana ki te take/kaupapa
- te whakamahi i ēnei āhuatanga matua kua whakaraupapatia hei tautohu i ngā hiahia me ngā huarahi e wātea ana
- te tuitui haere i ēnei mea katoa me te tārai i ngā tohutohu.



Ko te rerekētanga i waenga i te eke paetae me te eke kaiaka ko te āhei ki te whakaraupapa i ngā āhuetanga matua, mā te āta whakaaro ki ngā pānga me ngā whakawhitiwhitinga matua, kātahi ka tautohu i ngā hiahia me ngā huarahi wātea.

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

- te hoatu taunakitanga hei tautoko i te āhua o tō whakaraupapa i ngā āhuetanga matua
- te whakamārama i ngā pānga me ngā whakawhitiwhitinga matua
- te whakamahi i ēnei hei arotake i ngā hiahia/ngā huarahi e wātea ana
- te tuitui haere i ēnei mea katoa me te tārai i ngā tohutohu kia mārāma ai he aha katoa ngā mahi kia mahia e tatū ai te kaupapa/take.

Ko te rerekētanga i waenga i te eke kaiaka me te eke kairangi, ko te āhei ki te hoatu taunakitanga hei tautoko i te whakaraupapatanga, me te arotake i te whakaraupapatanga o ngā āhuetanga matua.

He Kupu Taka

hiahia me ngā mea angitu	<i>needs and opportunities</i>
Paerewa Paetae	<i>Achievement Standard</i>
pūtake matua	<i>key factor</i>
take tuku	<i>given issue</i>
tautuhi	<i>identify</i>
whakamārama	<i>explain/justify</i>

whakamātau	<i>evaluate</i>
whakataka tuatahi	<i>prioritise</i>
whakatau	<i>resolve</i>
whakatauirā	<i>formulate</i>
whakataunga here	<i>implication</i>
whakawhitinga	<i>interaction</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>
hātepe/tukanga	<i>process</i>
hinengaro auaha	<i>ingenuity</i>
hiranga	<i>excellence; superior</i>
hoahoa	<i>design</i>
huarahi wātea	<i>opportunity</i>
kaka-aku	<i>textile</i>
kawenga	<i>activity</i>
kirihou	<i>plastic</i>
kiritaki	<i>customer; client</i>
koiora	<i>biology</i>
konganuku	<i>metal</i>
korehāhā	<i>extinct</i>
kounga	<i>quality</i>
kōwhiri	<i>select</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>
ohaoha	<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 haumaruru	<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>

