

Hangarau



HANGARAU

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 tuawhakarere
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 ākongā, 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 ākongā. 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

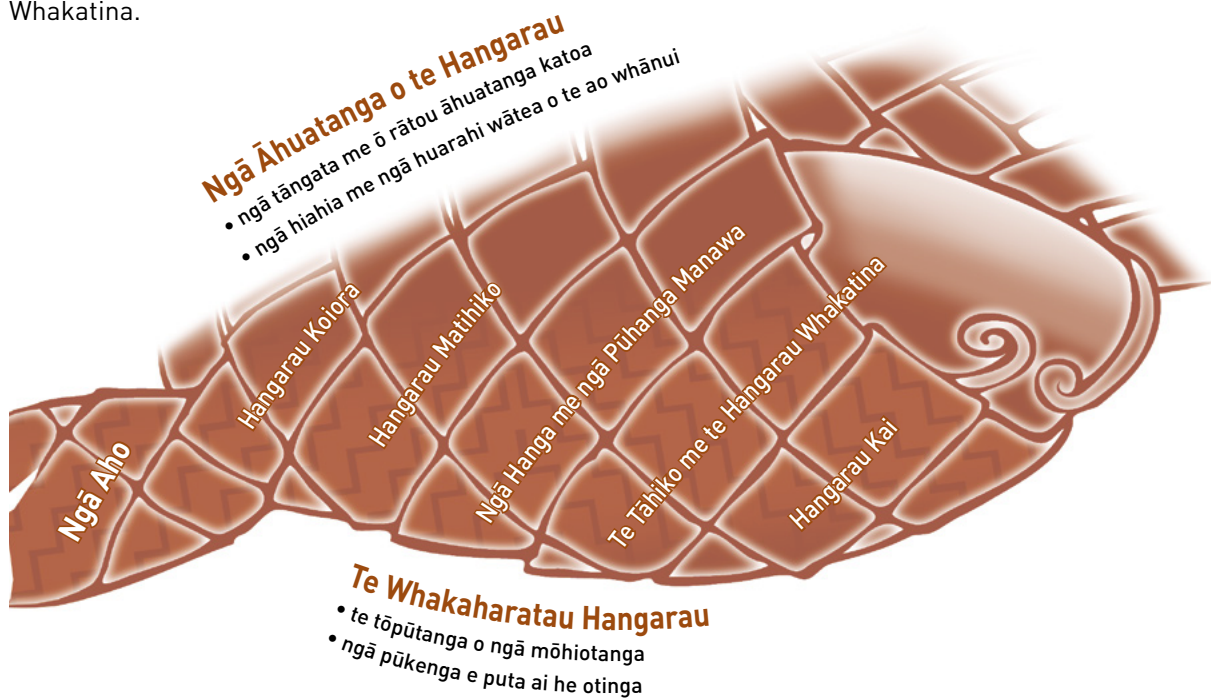
E rua ngā whenu, ko Ngā Āhuatanga Matua o te Hangarau me Te Whakaharatau Hangarau. Kātahi ka taka mai ki ngā aho hangarau e rima. Ko te Hangarau Kai, ko te Hangarau Koiōra, ko Ngā Hanga me ngā Pūhanga Manawa, ko Te Hangarau Matihiko, ko Te Tāhiko me te Hangarau Whakatina.

E tika ana kia tūhuratia ngā āhuatanga 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 ākongā.

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.



HANGARAU

Ngā Āhuetanga o te Hangarau

Ka whakaahuatia te whakaharatau hangarau e:

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

Ka rangahau, ka tūhura ngā ākongā kia mārama ai rātou ki ngā uara me ngā whakapono o te tangata, kia mārama anō ki te pāpātanga o aua āhuetanga 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 hapori. 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 whakamahī 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 marama ngā ākongā ki ngā hapori, ki ngā ahurea me ngā tāngata taketake;
- kia marama ngā ākongā ki ngā mātāpono hangarau me te tika o te whakamahī.

Ngā Aho	Hei whakamārama
Hangarau Koiora	Ko tā te hangarau koiora, he whakamahī 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 āhuetanga o te raweke ira.
Hangarau Matihiko	E rua ngā Anga Tupuranga Hangarau Matihiko me ōna whakatupuranga ka taka iho i te aho Hangarau Matihiko: 1. Te Tupuranga Whakaaro Rorohiko E waru ōna whakatupuranga e wetewetehia ana ngā whakaaro rorohiko kia whai māramatanga ki ngā rapanga o te papatono rorohiko matatini me ōna momo hātepe, e whaitake ai te waihanga papatono ki te ao tūturu. 2. Te Tupuranga Tangata me te Rorohiko E rima ōna whakatupuranga e whakatau ana i ngā tikanga me ngā mātāpono ki te whakahaere tūmahi e tū ai hei kirirarau matihiko.
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 āhuetanga katoa o te whakatipu, te hauhake, te tohu, te tunu, te rokiroki me te tākai kai. Ka tūhuratia hoki ngā āhuetanga kawekawe o ngā tūmomo kai hei whakahiato i ētahi atu kai.

TAUMATA 1

TAUMATA 2

Ngā Āhuetanga o te Hangarau

1. Ka tūhura i tō rātou ao, ka titiro ki:
 - ngā whakapono me ngā uara o te tangata;
 - te whakamahi i ngā rawa o te taiao o mua, o nāianei hoki.

1. Ka whakawhitiwhiti kōrero mō te hononga o te tangata me te taiao, arā:
 - ka whakamārama i ngā uara e whakamahia ana e te tangata;
 - ka whakamārama i ngā tikanga o te whakamahi rawa.

Te Whakaharatau Hangarau

2. Ka tūhura, ka tautohu i:
 - ngā hua hangarau whānui;
 - te take me te whakamahi i ngā momo hua.
3. Ka whakaputa, ka whakatairanga i ōna hiahia hei mahere māmā, arā:
 - te āhua o te hua;
 - ngā rawa;
 - he hātepe kia tīmataria ai te hanga.

2. Ka rangahau, ka whakahiato i ōna hiahia hei mahere. Ka whakaarohia ēnei:
 - he hātepe;
 - ngā mātāpono;
 - ngā momo rawa.
3. Ka whakamātau, ka aromātai i te otinga i runga anō i te āhua o:
 - te hiahia, te huarahi wātea rānei;
 - ngā rawa kua whakamahia;
 - ngā mātāpono.

Te Tupuranga Whakaaro Rorohiko

Whakatupuranga 1: Ko te whakaaro hātepe

Whakatupuranga 2: Ko te hanga hātepe

Te Tupuranga Tangata me te Rorohiko

Whakatupuranga 1: Ko te rorohiko hei pupuri kōrero

Ka mārama ko tā te rorohiko he pupuri kōrero, mā te kaiako tētahi mahi whakahiato e ārahi: ki te waihanga; ki te raweke; ki te pupuri; ki te tiki; ki te tuari hoki.



TAUMATA 3

TAUMATA 4

Ngā Āhuetanga o te Hangarau

1. Ka tautohu, ka whakaputa whakaaro e pā ana ki:
 - ngā whakahiatotanga hangarau i roto i ngā wā;
 - ngā whakapono me ngā uara;
 - ngā tikanga ka whakamahia e te tangata.

1. Ka āta whakaaro ki ngā uara me ngā whakapono kua whakamahia, kia mārama ai ngā āhuetanga o te otinga kua puta. Me āta whakaaro ki:
 - ngā mātāpono hangarau;
 - te hāngaitanga ki te tangata;
 - te pāpātanga ki te taiao;
 - te pānga i ngā wā e heke mai nei.
2. Ka mārama ki ngā hua o te whakawhitihiti kōrero i waenganui i te hapori me te ao whānui.

Te Whakaharatau Hangarau

2. Ka whakaraupapatia he mahere hoahoa whaitake.
3. Ka whiriwhiria ngā kōrero e pā ana ki ngā mātāpono ka whakamahia.

Tērā ko:

 - te taha rerehua;
 - te whaikiko;
 - te mauroanga;
 - te māiatanga;
 - ngā tikanga haumaruru.
4. Ka whakamātau, ka aromātai i te hoahoa. Ka kōwhiritia tētahi huarahi kia tika rawa.

3. Ka whakamahia he mahere, ka whakamātauria kia kitea:
 - te whanaketanga;
 - te tōtika o te mahi.
4. Ka whakahiatotia ngā pūkenga ā-ringa, ā-hinengaro, taha auaha anō hoki.
5. Ka whakamātauria te hua i runga anō i te āhua o te hiahia me te urupare a ngā kiritaki.
6. Ka mārama ki te whakahaere o ngā pūnaha hangarau.

Te Tupuranga Whakaaro Rorohiko

Whakatupuranga 3: Ko te waihanga papatono rorohiko

Ka whakawhanake i tōna mōhiotanga ki te pūtake o te hātepe hei mahi waihanga papatono rorohiko.

Whakatupuranga 4: Ko te waihanga hātepe papatono

Ka wāwāhi rapanga ki te waihanga hātepe mā ngā paparanga papatono e toru, te raupapanga, te kōwhiringa me te whitiauu.

Te Tupuranga Tangata me te Rorohiko

Whakatupuranga 2: Ko te whakatau tikanga pūnaha tūturu

Ka whakatau tikanga ki te waihanga; te raweke; te pupuri; te tiki; te tuari me te whakamātau rānei i te kōrero o tētahi pūnaha tūturu.

TAUMATA 5

TAUMATA 6

Ngā Āhukatanga o te Hangarau

1. Ka whakatairanga i ō rātou ake whakapono, uara rānei hei otinga:
 - mō te whānau, te haporī, te hapū, te iwi rānei, ā, ka tūhura i te pāpātanga ki ētahi atu ahurea, hunga kiritaki hoki.

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 āhukatanga 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

2. Ka tātari i ā rātou mahere hoahoa me ngā mahere hoahoa a ērā atu ki te:
 - tautohu i ngā whakatakotoranga pai ake;
 - kōwhiri i ngā rawa e tika ana;
 - whakarite i te hātepe.
3. Ka kimi rautaki hei whakatairanga i ngā otinga kua puta.

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

Te Tupuranga Whakaaro Rorohiko

Whakatupuranga 5: Ko te panoni rapanga hei waihanga papatono
Ka panoni i tētahi āhua o te rapanga kia mārama ai ki te hātepe o te hangarau matihiko hei mahi waihanga papatono.

Whakatupuranga 6: Ko te hātepe pūtaiao rorohiko
Ka arohaehae, ka whakamārama i te hātepe o te pūtaiao rorohiko hei mahi whakaatu raraunga me te tuhi papatono. Ka aromātai i te whitake ki te ao tūturu.

Te Tupuranga Tangata me te Rorohiko

Whakatupuranga 3: Ko te whakatau tikanga whakaoti hopanga
Ka whakatau tikanga ki te kawē i ngā mahi whakaoti rapanga mā te whitiauau ki te mahi hoahoa; ki te whakahiato; ki te waihanga; ki te pupuri; ki te whakamātau; ki te arotake kōrero matihiko hoki e tutuki ai tōna pūtake.

Whakatupuranga 4: Ko te whakahaere tūmahi
Ka whakamārama i ngā mātāpono waiwai o te whakahaere tūmahi, ka whai tukanga auau ki te whakatau mahi hoahoa me ngā momo taputapu hangarau matihiko ki te whakahiato; ki te pupuri; ki te whakamātau; ki te arotake kōrero matihiko hoki e tutuki ai tōna pūtake.

TAUMATA 7

TAUMATA 8

Ngā Āhuetanga o te Hangarau

1. Ka tūhura i ngā momo hangarau ka taea te whakarerekē i roto i ngā āhuetanga o te tangata, me ngā rauropi katoa, pērā i:
 - te whakaōrite whaioranga;
 - te raweke ira tangata.
2. Kia mārama ki ngā pāpātanga ki ngā whakapono o te tangata.
3. Ka tūhura, ka tautohe i ngā painga ohaoha o ētahi otinga me te pānga ki:
 - ngā whānau, hapū, iwi rānei;
 - ngā rohe, te motu, te ao whānui hoki.

1. Ka taukumekume i te pāpātanga o te otinga hangarau ki:
 - ngā uara, ngā whakapono, me ngā waiaro;
 - ngā matatika o te tangata;
 - te ao tōrangapū;
 - te toitūtanga;
 - te taha ohaoha.

Te Whakaharatau Hangarau

4. Ka arohaehae i ngā otinga whaiaro, ā ētahi atu hoki, kia ahu whakamua ai te mahi.
5. Ka aromātai, ka whakamātau i ngā otinga, kia taea ai te whakarerekē, te whakahāngai.
6. Ka kōwhiri i ngā whakatakotoranga kia tika ai te otinga.
7. Ka whakatairanga, ka parahau i ngā otinga i runga anō i te āhua o te hiahia, o te urupare a te kiritaki, a te hapori whānui hoki.

2. Ka whakawhanake i ngā pūkenga whakahaere mahi kia puta ai he otinga.
3. Ka whakarite rautaki hei whakatairanga i ngā otinga.

Te Tupuranga Whakaaro Rorohiko

Whakatupuranga 7: Ko te whitake o te kōwhiringa raraunga

Ka matapaki, ka mōhio i te whitake o te kōwhiringa raraunga, ko te aromātai i ōna hua, ngā āheinga rokiroki me te tika o te hāngai ki ngā tūmomo hātepe.

Whakatupuranga 8: Ko te arohaehae wāhanga pūtaiao rorohiko

Ka arohaehae i ētahi wāhanga o te pūtaiao rorohiko, ka tātari hoki i ngā pānga ki ngā hātepe, ngā whakaaturanga raraunga me ngā mahi waihanga papatono.

Ka whakamahi i ngā pūmanawa rorohiko ki te whakawhanake, ki te tuhi me te whakamātau i tētahi papatono matatini.

Te Tupuranga Tangata me te Rorohiko

Whakatupuranga 5: Ko te tūhura kōwhiriranga umanga hangarau matihiko

Ka tūhura i ngā kōwhiringa whānui o ngā umanga hangarau matihiko i tōna ao, i te motu, i te ao whānui tonu. Ka whakamārama hoki i ngā pānga ki ngā whakatau mahi hoahoa me ngā momo taputapu hangarau matihiko hei mahi aromātai, hei mahi whakawhanake hoki i ngā mātāpono waiwai o te whakahaere tūmahi.

HANGARAU

KUPU TAKA

ao tūturu	<i>real world</i>	pūnaha	<i>system</i>
arotake	<i>evaluate</i>	pūhanga manawa	<i>mechanical</i>
arotautanga	<i>optimisation</i>	pūkenga whakahaere mahi	<i>project management skills</i>
auaha	<i>creative, innovative</i>	pūtaiao rorohiko	<i>computer science</i>
hangarau kai	<i>food technology</i>	rauropi	<i>living organism</i>
hangarau koiora	<i>biotechnology</i>	rautaki	<i>strategy</i>
hangarau matihiko	<i>digital technology</i>	rawa	<i>resource, materials</i>
hangarau whakatina	<i>control technology</i>	rawa ora	<i>living material</i>
hapori	<i>community</i>	raweke	<i>manipulate</i>
hātepe	<i>algorithm</i>	rerehua	<i>aesthetics</i>
hinengaro auaha	<i>ingenuity</i>	rokiroki	<i>store (data)</i>
hiranga	<i>excellence, superior</i>	tāhiko	<i>electronics</i>
hātepe	<i>process</i>	tāhiko me te hangarau whakatina	<i>electronics and control technology</i>
hoahoa	<i>design</i>	taukumekume	<i>debate</i>
huarahi wātea	<i>opportunity</i>	tautohu	<i>identify</i>
kiritaki	<i>customer, client</i>	tikanga haumaruru	<i>safety procedures</i>
kirihou	<i>plastic</i>	toitū	<i>lasting; sustainable</i>
kirirarau matihiko	<i>digital citizen</i>	tuari	<i>share</i>
konganuku	<i>metal</i>	tūhura	<i>explore, investigate</i>
korehāhā	<i>extinct</i>	tukanga	<i>process</i>
kōrero matihiko	<i>digital content</i>	tauwhāiti	<i>specific</i>
kōwhiri	<i>select</i>	urupare	<i>feedback, response</i>
kounga	<i>quality</i>	utauta	<i>equipment</i>
koiora	<i>biotechnology</i>	waiwai	<i>basic</i>
māia	<i>confidence</i>	whaiaro	<i>personal</i>
mauroanga	<i>durable</i>	whaikiko	<i>purposeful</i>
matatika	<i>ethics</i>	whai patanga	<i>purposeful, useful</i>
mātau	<i>know, understand</i>	whakaaro rorohiko	<i>computational thinking</i>
matū	<i>materials</i>	whakaharatau hangarau	<i>technological practice</i>
matū waihanga	<i>synthetic</i>	whakahiato	<i>develop</i>
ohaoha	<i>economics</i>	whakatairanga	<i>promote</i>
paparanga	<i>layer</i>	whakataurite	<i>compare</i>
papatono	<i>programme (computer)</i>	whakatupuranga	<i>progression</i>
pāpori	<i>social</i>	whakawhanake	<i>develop</i>
pāpā	<i>impact</i>	whitiauau	<i>iterative, iteration</i>
parahau	<i>justify</i>		
paturopi	<i>antibiotics</i>		