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# Te Whakaoranga Inanga

He whakamāramatanga me  
nga hononga ki te  
marautanga

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Te tāhuhu o te mātauranga  
Te marautanga o Aotearoa

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*Nā Amy-Rose Hardy,  
Nga Mahi Te Taiao*

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# He whakaoranga inanga

## Kōrero Whakamārama

Ko te whainga o ngā mahi whakaora inanga ko te tautohu, te tiaki, te whakaora me te whakapai i ngā wāhi noho o nga Inanga Māori (*Galaxias maculatus*) i ngā kōawa me ngā awa. Ahakoa e kitea whānuitia ana ngā Inanga i te tuakoi tonga, e kii ana kei te roroku ngā Inanga ki Aoteroa. Heoi he hiranga tā ngā Inanga ki te oranga o te pūnaha hauropi waimāori. Ko te nuinga o te taupori inanga he Inanga Maori, ā he puna kai whai take mō ngā momo ika me ngā momo manu māori. Ka whai pānga anō ki te whakawhitinga pūngao mai i te moana ki ngā awa me ngā roto.

Kua āta whiriwhiri i ngā take e roroku ana ngā Inanga i ngā tau kua hipa. I tirohia ngā mahinga hopu inanga i te awa o Mokau, ā i kitea he iti noa ngā inanga o te taupori i mau e ngā kaihiika. Koia nei ētahi āhuatanga e whai pānga ana ki te rorokutanga o ngā Inanga - ko te whakamaroke i ngā repo me ngā rohe kōreporepo, te whakawhāiti rerewai, te hanga o ngā pāpuni, te whakawhitinga awa, ngā kauhanga raro kanukanu me te kuhunga o ngā momo ika rāwaho (taraute, *Gambusia*). I ēnei rā e whakapae ana ko te āhuatanga matua e tūkinno ai i ngā Inanga ko te whakararunga o ngā nōhanga toene. (NIWA, 2016).

E hua ai ngā toene Inanga i ngā otaota i ngā tahataha o ngā awa e kaha pākia e ngā tai pari o te kōanga. Ka noho ngā hua ki runga ake i te taumata wai tae noa ki te kōanga o te tau whai muri, ā ka kawea ngā pūhouhou e te wai ki te moana. Nā te rereke haere o ngā taha awa e tūkinno ai nga nōhonga toene a te Inanga, arā ngā ara takatakahi a ngā kau, te whakawātea otaota, te hanga tahataha horihori me ngā āhuatanga whakahaere i ngā mahi waipuke.

Nā te kaunihera ā rohe o Tūranga te Mahi Whakaora Inanga i whakarite hei tiaki, hei whakaora, hei whakapai i ngā nōhanga Inanga, waihoki ngā nōhonga toene a te Inanga. He whakahirahira ngā mahi whakaako hei tautoko i te tukanga whakaora, ā e taea e nga kura te hapai i o rātou ākongā, whānau, hapori kia tika ngā whakaakoranga mō ngā mātauranga tiaki taiao. Arā anō ngā hua o ngā āhuatanga ako e whai pānga ana ki te huringa ora o te Inanga, te wāhi ki ngā māwhaiwhai kame me ngā whakatūpatoranga o ngā āhuatanga e tūkinno ai ngā nōhanga.

E whai ake he tauira mahi mō t/ētahi akomanga e whai pānga anō hoki ki te whanaketanga me te whakahaerenga o tētahi māhere tiaki/whakaora Inanga. Ahakoa kua whakaritea ngā mahi kia hāngai ki ngā Taumata 3 & 4 e taea tonu te whakamahi i ngā reanga o runga ake. Ko te aronga matua kia kōtuitui i ngā hiahia a ngā ākongā, ngā ngohe, ngā rautaki me ngā rauemi kia āhei ngā pūkenga o te tūhuratanga te whakawhiti ki kaupapa kē atu.

He paetukutuku tautoko i ngā whakaakoranga:

The Whitebait Connection <http://www.whitebaitconnection.co.nz/>

GDC <http://www.gisbornedistrictcouncil.co.nz>

He Awa Ora, Healthy Rivers Project <http://www.nmtt.co.nz>

## Te Wātaka Rāpopoto – He Aratohu Whakaako

Whakarāpopotonga	Ngā haora ia rā
1. Hui tūtaki i ngā kaiako	Rā 1: ½ - 1 haora
2. Wāhanga ako tutatahi: Whakaaturanga hiko ki rō akomanga	Rā 2: 1 - 2 haora ia akomanga
3. Haerenga tuatahi: Wāhi 1	Rā 3: 2 - 3 haora
4. Haerenga tuarua: Wāhi 2	Rā 4: 2 - 3 haora
5. Wāhanga ako tuarua: Māhere Mahi	Rā 5: ± 2 haora
6. Haerenga tuatoru: Wāhi 1, 2 rānei – Whakaora	Rā 6: ± 2 haora

### 1. Hui tūtaki i ngā kaiako

He hui tūtaki mō ngā kaiako me ngā kaiwhakahaere o te kaupapa. He rārangi take:

- Ngā whainga o te akomanga, me pēhea te kaupapa e tautoko i ngā whainga
- Te whiriwhiri i ngā wāhi tūhura mō ngā haerenga me ngā whainga mō ngā mahi whakaora
- Ngā whakaritenga haumaruru

Hononga ki Te Marautanga	Ngā Whāinga	Ngā akoranga	Ngā Ngohe me ngā mahi
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### 2. Whakaaturanga hiko ki rō akomanga

<p>Te Ao Tūroa - Te Rauropi</p>	<p>Ka ako haere i ngā āhuatanga motuhake o ngā rauropi e whai oranga ai tēnā me tēnā.</p>	<p>He aha ngā take e mate haere ai ngā Inanga: Nā ngā mahi hii/hopu, nā te tūkinotanga o ngā nōhanga rānei?</p> <p>Ka pēhea mātou e mōhio ki hea ahu mai ai ngā Inanga, he aha hoki ngā ara haere a ngā punua?</p>	<p><b>Ngōhe:</b> Kia ako haere i ngā kōrero whakamārama mō te Inanga kia hāngai ki ngā momo Inanga māori. Kia mōhio ki te whakamārama i te huringa ora o te Inanga me te āhua o te nōhanga e ora pai ai te Inanga, e whānau pai ngā punua.</p> <p><b>Ngā mahi:</b> Ka whai māramatanga i nga kōrero me nga mātauranga mō te Inanga mā te whakaaturanga hiko hei timatanga kaupapa. Tēnā tirohia te whakaaturanga hiko ki te āpitihanga rauemi.</p> <ol style="list-style-type: none"> <li>1. Ka hoatu i ngā rauemi me ngā ngohe mahi ki rō akomanga hei tautoko i ngā akoranga o te whakaaturanga, he mahi hei whakawhanake i ngā mōhioatanga o ngā ākongā. Tirohia ngā rauemi, ngā hei mahi me ngā mahere ako ki te kōpaki <i>Teaching Activities</i>. He rauemi tautoko anō ki te paetukutuku o WBC: <a href="http://www.whitebaitconnection.co.nz">www.whitebaitconnection.co.nz</a>.</li> <li>2. Tirohia te rauemi <i>Whitebait Run</i>, he kēmū e whakaatu ana i te huringa ora o te Inanga me ngā whakatūpatoranga i ngā wāhi noho. He mahi hei whakapakari i ngā ariā i akona i te whakaaturanga.</li> </ol> <p>E āhei ana te hanganga o ngā raeumi hiko pērā i ngā ngohe pāhekoheko e hono ana, e raupapa ai ngā wāhanga o te huringa ora o te Inanga.</p>
<p><b>3. Haerenga Tuatahi, Wāhi Tūhura 1 me;</b>  <b>4. Haerenga Tuarua: Wāhi Tūhura 2</b></p>			
<p>Ka hono ngā ngohe me ngā mahi mō ngā haerenga e rua, he mahi kōrero/raraunga. Mā tēnei e āhei ana te whakatairite i ngā kōrero mō ngā wāhi e rua. Ka waia anō nga ākongā ki te whakamahi i ngā rawa me te whakapakari i o rātou mōhioatanga me o rātou pūkenga ki te aromatawai mā te tiro tiro ki ngā nōhanga toene, nga tūkinotanga, ngā whakatūpatoranga me ngā wahi pai hei whakaora i te Inanga.</p>			
<p>Te Ao Tūroa - Te Taiao</p>	<p>Ka mārama e rite ana te rauropi mō tōna wāhi noho, ā, tērā ka raru te rauropi ina rerekē taua wāhi noho</p>	<p>Ka whanake haere te mōhio ki ngā āhuatanga ora pai ki te whanautanga me te tipuranga o te Inanga.</p>	<p><b>Ngōhe:</b> Ka whakaoti i te aromatawai awa hei tāutu i te painga o te wai me te nōhanga kia whakatau ina he wāhi pai ki te whakawhānau Inanga. Ka mōhio ki te whakamārama i te nōhanga, nga matū o te wai me te aromatawai i ngā raraunga koiiora i kohia i te haerenga tuatahi.</p> <p><b>Ngā mahi:</b> He haerenga ki te wāhi i whakaritea. Mā te whakawhiti kōrero me te patapātai e whakatau ai ngā mahi a ngā ākongā.</p>

		<p>He nōhanga pai ki tōu awa?</p>	<ol style="list-style-type: none"> <li>1. Ka ine ngā ākonga i te maha o te tote ki rō wai kia tāutu i te wāhi o te matakahi tote mā tētahi toromoka ā ringa. Ka mōhio i te wāhi o te matakahi tote i te wā ka ine i te wai māori i te mata o te wai, ā ka āta piki te maha o te tote ki rō wai i a te toromoka e heke ana ki ngā wāhanga wai o raro. Ka tāruarua te mahi mā te hikoi i ngā tahataha o te awa kia kimi i te pū o te matakahi tote. Ka tāutu i tēnei wāhi i te wā o ngā tai o te kōanga. Tirohia te rauemi <i>Spring Tides</i> i te kōpaki <i>Resources for Curriculum Links</i>.</li> <li>2. I te tautohunga o te matakahi tote e timata ai te whakawhitinga kōrero/whakaaro mō nga āhuatanga e kite ana i te nōhanga. Arā ko ngā otaota e tipu ana i ngā tahataha o te awa, te rōnaki o ngā taha, te āhua o nga parataiao me ngā āhuatanga nōhanga i tāutu i te whakaaturanga hiko. Ka tuhia ngā kitenga ki te pepa mahi <i>Monitoring Sheet for Schools (level 3-5)</i> i te kōpaki <i>Resources for Curriculum Links</i>.</li> <li>3. Ka tā ngā ākonga i tētahi anga e whakaatu ana i te rōnaki o ngā taha o te awa, ngā momo otaota, te marumarua me te whānui o te awa. Ka whakamahia ēnei anga hei tirohanga i te wā ka hoki ki te akomanga. Ka tā/tuhi hoki i tētahi anga o te awa e whakaatu ana i ngā rākau/wāhie, toka, tipu wai me ngā pūkohu wai i roto i te awa.</li> <li>4. I te otinga o te aromatawai o te nōhanga ka kohia ētahi tauira wai me te whakamahi i ngā toromoka hiko kia whakamātau i te hanga matū o te wai.       <ol style="list-style-type: none"> <li>a) Ka ine ngā ākonga i te rere o te wai mā tētahi tēpā ine me tētahi ārani iti. Ka ine i te tawhiti i te pae o te awa mā te tēpā ine (e.g. 10-20m). Mā tētahi ākonga te ārani e heri ki te timatanga (kia tūpato, kaua e whakararu i te rere o te wai) Ma tētahi ākonga kē e whakamahi i te matawā tū, ka karangahia 'TIMATA' katahi ka whakatau i te ārani ki te wāhi timata. Ka mutu te ine i te wa ka tae te ārani ki te wāhi mutunga, ka tuhia te wā ki tētahi pepa. Kātahi ka tātai i te tere o te wai (m/hekona) kia kite inā he tere pai ki nga inanga.</li> <li>b) Ka whakamātauria inā he mahea te wai mā te tiro tiro ki te ipuipu wai. Ka whai wā ia ākonga ki te whakamātau i te wai, ka tuhia i ngā inenga katoa me te tātai i te inenga waenga mō te maheatanga o te wai.</li> <li>c) Ka whakamātau i te pāmahana o te wai, te taumata pH, te memehatanga o te hāora me te hihikotanga o te wai mā te whakatau i te toromoka ki te wai kia pūmau ngā inenga. Ka tuhia tētahi inenga mō ia whakamātautau ki te pepa mahi <i>Monitoring Sheet for Schools (level 3-5)</i></li> </ol> </li> </ol>
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			<p>5. Ko te mahi whakamutunga kia aromatawai i ngā raraunga koiora o te awa. Ka mahi ā roopu ki te kōhi raraunga. Mā ia roopu takirima tētahi ipu me tētahi kupenga kia kōhi i ngā tuaiwi-kore me ngā ika ki te awa.</p> <p>a) Me whakakii te ipu kia 1/4 kii i te wai me te whakatau ki te taha o te awa, koia te ipu pupuri i ngā kīrehe kia oti ranō te kohikohinga.</p> <p>b) Mēnā he mārō te papa o te awa ka taea te kōhi i ngā tuaiwi-kore mā te tiki i ngā toka me te ruirui ki roto i te ipu kia taka ngā kīrehe ki rō ipu. Mēnā he otaota e tipu ana i te mata o te wai ka taea te kōhi i ngā tuaiwi-kore ma te pēhi i te kupenga ki te otaota (mai raro ki runga</p> <p>c) Ka kohia tonutia ngā kīrehe kia rerekē ngā momo tuaiwi-kore me ngā momo ika.</p> <p>d) Heria nga ipu ki tētahi wāhi marumaru, ka tautohu i ngā momo kīrehe mā te Wai Care Invertebrate Field Guide Identification Sheet, ki te puka WIMP ID i te kōpaki <i>Resources for Curriculum Links</i>. Ka wāwahia nga tuaiwi kore ki nga tiriwā kia tautohua nga momo me o ratou taupori, ā ka kitea nga piro e whakatau ana i o ratou tūtohutanga. Ka tuhia te katoa o ngā ika me ngā tuaiwi kore ki nga tūtohi. Mā te tiro ki te maha, te ngaronga rānei o ngā tuaiwi kore e tātai ai i te MCI, arā te maha o nga tuaiwi kore mokitokito. Ka whakamahia te tapeke o ia momo ki te tātai i ngā piro mō te rārangi whakaatu i te huinga o ngā tuaiwi kore mokitokito (quantified macroinvertebrate community index-QMCI ) Tēnā tirohia ngā rauemi MCI me te QMCI mō te roanga o ngā whakamārama kia tātai tika i ngā piro mō ngā rārangi whakaatu.</p> <p>e) Ki te oti katoa ngā roopu te tuhi i ngā raraunga ka āta whakahoki i nga kīrehe ki te awa me te horoi i ngā ipu.</p> <p>Kei te puka nei ngā paeuru tautohu i ngā momo ika - 'The Reed Field Guide to New Zealand Freshwater Fishes written by R.M. McDowall (2000)' Ka taea te kimi ki ngā whare pukapuka, ki te paetukutuku o Niwa rānei: <a href="https://www.niwa.co.nz/freshwater-and-estuaries/nzffd/NIWA-fish-atlas/reading-list">https://www.niwa.co.nz/freshwater-and-estuaries/nzffd/NIWA-fish-atlas/reading-list</a></p> <p><b>He mahi anō:</b> Whakawhiti kōrero ki rō akomanga, arotake i ngā kitenga.</p> <p>1. He aha te āhua o te nōhanga, he pai/kāre rānei mō te whakawhanau inanga. Arotake i te anga i tāngia i te awa - tirohia ngā momo otaota, te rōnaki o ngā taha o te awa, mēnā he</p>
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			<p>āhuatanga e kaupare ana i te āheinga o ngā inanga ki te kauhoe i te awa, ki te ora pai ki taua wāhi.</p> <p>2. Whakataurite i ngā raraunga mō te hanga matū o te wai, ngā inenga me ngā whakamārama ki te pepa <i>Explanation of Scores</i>. Ka taea e ngā ākonga te mahi ā roopu ki te whakatau inā he pai/kāre ranei kia whakawhanau, kia ora pai ngā inanga. Ka whakamārama i ngā raraunga me te tuhi ki tetahi tūtohi.</p> <p>3. Whakataurite i ngā piro mō te MCI and/or QMC me te whakamārama i ngā piro - inā he pai te wai hei oranga mō ngā inanga,</p> <p><b>He āpitianga:</b> Kimihia ngā raeumi tautoko ki te kōpaki <i>Resources for Curriculum Links</i>. He rauemi tautoko anō ki te kōpaki <i>Teaching Activities</i> folder.</p>
<b>5. Wāhanga ako tuarua: Māhere Mahi</b>			
<p><i>Te Whakamahinga o Te Pūtaiao</i></p>	<p>Ka ako mō ngā mahi me ngā kaimahi e whakaputaina ai ngā mātauranga pūtaiao.</p> <p>Ka whakahāngai i tōna mōhio pūtaiao ki ngā whakatau me ngā mahi o te ao tangata, arā, hei whakaaro ki ngā take ā-iwi, me ngā take whānui, e pā ana ki te tangata, te</p>	<p>Te hiranga me te pānga o te tiaki i te whenua ki te oranga o ngā ika i ngā wai māori.</p> <p>Te whakamāhere me te whakamahinga o ngā mōhiotanga.</p>	<p><b>Ngohe:</b> Ohia manomano me te whakarite i tētahi māhere whakaora i ngā nōhanga toene me ngā mahi tipu mō ngā inanga. Ka taea te tāutu i ngā āhuatanga ā taiao me ngā āhuatanga wai e ora pai ai ngā inanga.</p> <p><b>Ngā mahi:</b> Ka whakaongaonga i ngā ākonga kia mātau ki ngā kōrero me ngā akoranga o te whakaaturanga hiko, te rangahau, ngā mahi ki rō akomanga me ngā haerenga.</p> <p>1. Ohia manomano ā akomanga i ngā maharatanga a ngā akonga, Mā te kaiako rātou e aki kia āta whakaarohia ngā take e whai pānga ana ki ngā inanga. He aha pea nga take? Te kuhunga o ngā kau ki ngā taha awa, ngā momo otaota, ngā parataiao, te rōnaki o ngā taha awa, marumarū, hanga matū o te wai, ngā whiwhinga MCI or QMCI.</p> <p>2. Whakarōopuhia ngā ākonga. Mā ia roopu tētahi take e ōhia manomano, e wānanga i ngā huarahi e taea te whakaora, tiaki rānei i ngā nōhanga toene. Hei tauira, take = ngā kau, e āhei ana te kōrero ki ngā kaitiaki o te whenua kia whakatūria he taiapa ki te nōhanga toene mō te wahanga o te tau e whakawhanau ana ngā inanga. hei aronga whakamua.</p> <p>Whakaraupapa i ngā mahi ki tētahi māhere, ko ngā āhuatanga whakahirahira ki runga ake, me ngā mahi me tutuki pai hei oranga mō ngā nōhanga. Tirohia ngā rauemi ki te kōpaki <i>Information Resources for Students and Teachers</i>. Ka whakaatu ēnei rauemi i ngā āhuatanga e puta ai he hua mō ngā take i tāutua.</p>



	porihanga me te taiao.		
<b>6. Haerenga 3: Wāhi Tūhura 1, 2 rānei - Te Whakaora</b>			
<i>Tikanga ā iwi</i>	Te Wāhi me te Taiao  Ka whakamārama i ngā whaiwāhitanga me ngā mātātaki o te torotoro mō te tangata, te wāhi me te taiao.	Ka whai wāhi ngā roopu ōkawa, ōpaki i te wāhanga whakaora o te māhere mahi i te mea he pānga nui tā ngā whakataunga ki te hāpori whānui.	<b>Ngohe:</b> Ka tāutu me te whakapā atu ki ngā roopu e whai wāhi ana ki tenei kaupapa whakaora. Me pēhea raāou e whakatau i ngā āhuatanga e whai pānga ana ki o rātou hāpori.  <b>Ngā mahi:</b> Mahi ki rō akomanga:  a) I te timatanga o nga mahi whakaora ka tāutu i ngā roopu ōpaki, ōkawa e whai wāhi ana ki te kaupapa. Mā te mahi ā akomanga, ā roopu rānei ngā ākongā e whakapā atu ki ngā roopu, ka whai wāhi ki te wāhanga whakaora i ngā inanga, he aha hoki ngā pānga a ngā whakataunga ki te hāpori whānui. Ko ētahi roopu: <ul style="list-style-type: none"> <li>- Department of Conservation</li> <li>- Hapu</li> <li>- Nga akonga/kura</li> <li>- Gisborne District Council</li> <li>- Scientists/Ecologists</li> <li>- Ministry of Fisheries</li> <li>- Nga kaitiaki o nga whenua</li> </ul> Hei timatanga ake, mā ngā ākongā e whakapā ki ngā roopu mā te tuhi reta e whakamārama ana i te māhere mahi. Ki te whakaae ngā kaiwhakahaere o ngā roopu me whai wā anō ki te whakapā atu ki te hāpori whānui kia angitū ai ngā mahi. Ka whakarite ngā rā me ngā wā e tika ana kia timata ngā mahi whakaora. Hei tauira, he rā whakatō mō te hāpori.

**He apitihanga:** He mea tautoko ngā ngohe me ngā mahi mō tēnei kaupapa heoi tirohia ngā kōrero ki te pepa *Whitebait Protection Project Links to the NZ Curriculum Level 3 – 4 (Year 7 and 8)* mō te roanga o ngā whainga ako me ngā wāhanga ako mo te Pūtaiao, Tikanga ā Iwi me te Hauora. E hāngai ana ngā ngohe me ngā mahi ki ngā putanga ako mō ia marau, ā he rauemi tautoko anō hoki mō ngā mahi ki rō akomanga.



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Te Whakaora Inanga

Ngā hononga ki Te Marautanga  
o Aotearoa (Tau 7 me 8)

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**Te Tāhuhu o te Mātauranga  
Te Mārautanga o Aotearoa**

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*Nga Mahi Te Taiao*

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## Ngā Whāinga Pūtaiao (Te katoa o ngā taumata)

<b>Ngā Whāinga Pūtaiao</b>	
Te Whakamahinga o te Putaiao	Ka ako mō ngā mahi me ngā kaimahi e whakaputaina ai ngā mātauranga pūtaiao. Ka whakahāngai i tōna mōhio pūtaiao ki ngā whakataua me ngā mahi o te ao tangata, arā, hei whakaaro ki ngā take ā-iwi, me ngā take whānui, e pā ana ki te tangata, te porihanga me te taiao.
Ngā momo Tūhurātanga	Ka oti te whakarōpū me te tautohu, te torotoro, te rapu tauira me te whakatauirā, te whakamātau tika, te whakaoti rapanga, te hanga i tētahi mea, i tētahi pūnaha rānei.
Te Reo Matatini o te Pūtaiao	Ka pakari haere te mōhio ki te reo matatini o te pūtaiao, o te pāngarau, me ngā pūnaha tohu pūtaiao, ā, ka whakamahia ēnei reo matatini hei pānui, hei whakaatu i ōna ake whakaaro, tae atu ki ō ētahi atu.
<b>Ngā Whāinga Pūtaiao: Te Ao Tūroa</b>	
Te Rauropi	Ka mārama haere ki ngā tukanga koiōra i roto i ngā rauropi katoa. Ka mōhio ka roa e puta ana ngā tukanga kukuwhātanga, e rerekē ai te puna ira o ngā momo koiōra.
Te Taiao	Ka mārama haere ki ngā momo koiōra maha a Papatūānuku; me ngā pāhekoheko o te rauropi ki te rauropi, ā, ki te taiao whānui hoki.
Papatūānuku	Ka mārama haere ki ngā hurihanga me ngā pūnaga a Papatūānuku, ngā hono me ngā pāhekoheko.
Ranginui	Ka mārama haere ki ngā hurihanga me ngā pāhekoheko o ngā ao ātea, mai i tēnei ao, tae noa ki ngā whetū.
<b>Whāinga Pūtaiao - Ō Ahupūngao</b>	
Te Tōpana me te Nekehanga	Ka mārama haere ki te tōpana me te nekenga, me te ako i ngā pūngao me ngā pāhekoheko e hāngai ana.
<b>Whāinga Pūtaiao - Ō Kawekawe</b>	
Ngā Āhūatanga me ngā Panoni Matū	Ka mārama haere ki ngā āhūatanga me ngā tukanga e panoni ai te matū, tae atu ki ngā tauhohe.
Te Whakamahi Pūmatū	Ka mārama haere ki ngā whakamahinga o te mātai matū, hei whakautu i ngā hiahia o te tangata
Te Hanga Matū	Ka whakamahi i ngā tauira me ngā pūnaha tohu hei whakaatu i te hanga korakora o te matū.
<b>Ngā Tautake Pūtaiao Me Ngā Kōrero o Mua</b>	
<p>Ka ako haere mō te pūnaha mātauranga o te pūtaiao, arā:</p> <ul style="list-style-type: none"> <li>• ōna huarahi whakatipu, me te wāhi ki ngā ariā me ngā huatau matua, ngā uara ā-hinengaro me ngā uara ā-wairua;</li> <li>• ngā tautake pūtaiao o ēnei rā, me ngā tautake tuku iho, e pā ana ki te ao tūroa;</li> <li>• ngā pānga o te mātauranga pūtaiao ki te tangata, te ao tangata, me te taiao.</li> </ul> <p>Mā ēnei akoranga, ka pakari ngā pūkenga arohaehae, hei āta whakawā i te ao pūtaiao, mai i tāna ake tirohanga.</p>	

He wāhanga i tango mai i te Marautanga o Aotearoa ki te paetuikutuku

<http://www.tmoa.tki.org.nz/Te-Marautanga-o-Aotearoa/Nga-Wahanga-Ako/>

## Ngā Whāinga Pūtaiao - Taumata 3 me 4

Hononga ki Te Marautanga	Ngā Whāinga	Ngā akoranga	Ngā Ngohe me ngā mahi
<b>Ngā Āhuatanga Whānui o te Pūtaiao</b>			
<p><i>Te Reo Matatini o te Pūtaiao</i></p>	<p>Ka pakari haere te mōhio ki te reo matatini o te pūtaiao, o te pāngarau, me ngā pūnaha tohu pūtaiao, ā, ka whakamahia ēnei reo matatini hei pānui, hei whakaatu i ōna ake whakaaro, tae atu ki ō ētahi atu.</p>	<p>Ngā rauemi aromatawai me te mātakitaki.</p> <p>Ka rangahau i ngā mātauranga pūtaiao.</p>	<p><b>Ngōhe:</b> Kia mārama ki ngā uara whai take e whakamātau ana kia kite inā he nōhanga pai hei oranga mō ngā Inanga- te pai o te wai, te hanga matū o te wai, nga āhuatanga koiora e tika ana kia ora ai ngā Inanga i taua nōhanga.</p> <p><b>Ngā mahi:</b> Ki rō akomanga:</p> <ol style="list-style-type: none"> <li>1. Ka taea ngā ākongā te hanga i ngā kari e whakamārama ana i ngā whakamātautau = ( pāmahana o te wai, te taumata pH, te memehatanga o te hāora ki rō wai, te hihikotanga o te wai, te tere o te wai, te maha o te tote ki rō wai) Ki tētahi taha o te kari he pikitia, he kupu rānei, ā ki muri he kōrero whakamārama. Hei tauira, te tere o te wai = me āta rere te wai i te mea kāre e taea e ngā inanga te kauhoe inā he kaha te tere o te wai. Ka raru hoki ngā Inanga inā he ārai e kaupare ana i te āheinga o te inanga ki te kauhoe ki ngā wai māori, ki reira tipu ai. He rautaki pai anō tēnei kia waia ngā ākongā ki ngā kupu hou e hāngai ana ki tēnei kaupapa. Hei tauira: toene = spawn or roe</li> </ol> <p>E taea te hanga rauemi pāhekoheko mō ngā momo hangarau .</p> <ol style="list-style-type: none"> <li>2. He mahi takitahi, ā roopu rānei: Whakataurite i ngā mātauranga mai i ngā puna rerekē e kitea ai te whānuitanga o ngā kōrero a tirohanga pūtaiao, ā tirohanga māori hoki me te whakatau he aha ngā akoranga hei tautoko i a rātou e tuhi ana i ngā mahere whakaora inanga.</li> </ol>
<b>Te Ao Tūroa</b>			

<p><i>Te Ao Tūroa - Te Rauropi</i></p>	<p>Ka āhukahuka ki ngā tukanga koiora kei ngā rauropi katoa, me te mōhio anō he rerekē aua tukanga i ngā momo rerekē.</p>	<p>Ngā momo ika māori</p>	<p><b>Ngohe:</b> Ka whakataurite i ngā Inanga Māori ki ngā momo kē o te whānau Galaxia me ngā huringa ora o ngā momo ika māori. Ka tāutu me te whakamārama i ngā oritenga me ngā rerekētanga o ngā inanga māori ki ngā momo ika māori.</p> <p><b>Ngā mahi:</b> Ka mahi a roopu ngā ākongā (takirima) ki rō akomanga. Ka whakamahia ngā mōhiotanga kia tāutu i ngā rerekētanga o ngā huringa ora o te inanga maori me ngā momo kē o te whānau galaxia.</p> <ol style="list-style-type: none"> <li>1. Mā ngā ākongā tētahi pikitia e tā, ki tē pepa A3, e whakaatu ana i te rerenga o te wai mai i ngā maunga tae noa ki te moana - me tā hoki i te ngutu awa me ngā ara wai tīhoi pērā i ngā kōawa.</li> <li>2. Ka tāpirihia ngā āhukatanga motuhake ki te oranga o ngā Inanga. Hei tauira: Te matakahi tote, ngā otaota ki ngā taha awa, ngā wai rere pōturi, ngā kauhanga raro e āhei ana te kuhunga o nga Inanga, ngā ārai, ngā hīrere me ngā wāhi noho o ngā inanga pakeke. Me ngā kōrero e whai take ana ki ngā tukanga ora o te inanga. Ka tohua mā te pere ki nga wāhanga o te huringa ora. I te mutunga ka hua he panui ataata e whakaatu ana i te huringa ora o te inanga me ngā āhukatanga a taiao e ora pai ai, e tipu pai ai tēnei momo mai i te moana ki te wai māori.</li> <li>3. Ka taea e ngā ākongā te tā, ki runga i te panui atatata me tētahi pene rerekē te tae i ngā rerekētanga o ngā huringa ora o tētahi atu momo inanga me ngā āhukatanga motuhake mō aua momo. Mā ia roopu tētahi momo rerekē e whakataurite. Hei tauira: He kaikauhoe pakari te Koaro, ā e taea tēnei momo te kauhoe i ngā hirere me ngā pāpuni kia tae atu ki ngā nōhanga pai ki a rātou.</li> </ol> <p>Me rangahau i ngā kōrero mō ngā momo rerekē i mua i tēnei ngohe - he kaupapa rangahau mō ētahi o ngā ngohe o mua.</p>
<p><i>Te Ao Tūroa - Te Talao</i></p>	<p>Ka mārama e rite ana te rauropi mō tōna wāhi noho, ā, tērā ka raru te rauropi ina rerekē taua wāhi noho.</p>	<p>Te rorokutanga me te whakaoranga o nga nōhanga toene ika me ngā nōhanga pakeke.</p>	<p><b>Task:</b> Ka tāutu i te pānga o te tangata ki ngā toene inanga me ngā nōhanga pakeke - He urutaunga e āhei ana te oranga o te inanga ki te taiao rerekē, kāore rānei? Ka tāutu i ngā panonitanga āhuarangi. Ka matapae i ngā panonitanga ki te taiao me te whakatau he aha te pānga ki ngā inanga.</p>

		<p>Ngā pānga o te rerekētanga huarere ki ngā ika diadromous.</p>	<p><b>Ngā mahi:</b> He mahi ā roopu, ki rō akomanga. He rauemi tautoko ki te kōpaki <i>Teaching Activities</i>.</p> <ol style="list-style-type: none"> <li>1. Te pānga o te tāngata. Hei tauira, te whakawātea i ngā otaota, ngā ara takahi a ngā kau, te hanga kauhanga raro e whakararu ai i te ara kauhoe o ngā inanga, ngā poutini whakamate tipu, te kuhunga o ngā momo kē pērā i te <i>Gambusia Affinis</i> (mosquito fish)       <ol style="list-style-type: none"> <li>a) Ohia manomano i ngā pānga a te tangata ki ngā nōhanga toene me ngā nōhanga pakeke a te inanga.</li> <li>b) Wānangahia ngā urupare a ngā inanga ki ngā pānga a te tangata. Hei tauira, he momo ārai ngā kauhanga raro ki te ara kauhoe a ngā inanga, nā tēnā me piki ake ngā inanga i te kauhanga. Ki te kore rātou e tae atu ki te matakahi tote ka whakawhānau i ngā toene ki tētahi nōhanga kāre i te pai rawa hei oranga mā ratou, ka kawea rānei i a rātou ki waho ki te moana.</li> <li>c) Pokaihia tētahi pepa A3, tāngia te nōhanga pai ki ngā inanga i tētahi taha, ki tēra atu taha tāngia te taiao me ngā āhukatanga e whai pānga ana ki te tangata kia marakerake te kite i ngā rerekētanga o ngā taiao e rua. Hei tauira, ko ngā āhukatanga pai rawa ko ngā otaota tika ki nga taha o ngā awa, ka āhua papatahi te rōnaki o ngā taha awa, kāre he ārai, he ngāwari te rere o te wai.</li> <li>d) Wānangahia, whakawhiti kōrero mō ngā paearu ā taiao e tika ana kia whakawhānau, kia tipu, kia ora pai ai ngā inanga me te pānga o te tangata me ā mātou mahi ki ēnei tūmomo āhukatanga.</li> </ol> </li> <li>2. Ka matapaki i ngā āhukatanga o te taiao whānui, pērā i te āhuarangi me te pānga ki te oranga o ngā inanga. Ka taea e ngā ākongā te rangahau i ngā āhukatanga āhuarangi me te whakarite i tētahi tūtohi e whakaatu ana i te āhukatanga me te pānga. Hei tauira, Ka piki te taumata o te moana = ka neke te wāhi o te matakahi tote ki tua o te awa, ka roa ake ta tawhiti kauhoe mō ngā inanga.</li> </ol>
<p><i>Te Ao Tūroa - Te Rauropi</i></p>	<p>Ka whakarōpū whāiti ā-pūtaiao i ētahi rauropi.</p>	<p>Ngā momo ika māori Ngā pūkōhu me ngā tipu mokitokito.</p>	<p><b>Ngōhe:</b> Whakataurite i ngā momo galaxias. Tāutu i ngā rerekētanga i waenga i nga pūkōhu me ngā tipu mōkitokito. Tāutu i ngā momo nō Aotearoa me te whakataurite ki ētahi atu ika e.g. inanga (that are widespread across the pacific). Ka taea te whakarōpū i ngā tuaiwi-kore mōkitokito ki o rātou āhua tūtohu me te tāutu i ngā momo rerekē.</p>



<p><i>Te Ao Tūroa - Te Taiao</i></p>	<p>Ka āhukahuka, ka whakamārama i ngā panoni o ngā momo koiora (me ngā mea motuhake o Aotearoa), o neherā tae noa ki tēnei wā.</p>	<p>Ngā tuaiwi-kore mōkitokito, Ngā rākau māori me ngā ponga Ngā manu rere-kore.</p>	<p><b>Ngā mahi:</b> He mahi ki rō akomanga.</p> <ol style="list-style-type: none"> <li>1. Tā i ngā āhukatanga motuhake o ngā momo galaxias ki tētahi pikitia nui. Mā te whakamahi i ngā tae rerekē e kite i ngā rerekētanga me ngā āhukatanga ōrite. Hei tauira, he tinana hāwaniwani, karekau he ūnahi, he āhua ōrite ngā maaka, ngā huringa ora me ngā āhukatanga whakawhānau ōrite. Mā te rangahau i ngā momo glaxias e whānui ai ngā mōhiotanga ā ngā ākongā ki te whkaturite i ngā momo galaxias.</li> <li>2. Ka tāutu i ngā rerekētanga i waenga i ngā pūkohu me ngā tipu mōkitokito mā te whakamahi i te rauemi: <i>Algae Identification Card, Categories of Periphyton for Visual Assessments</i> me <i>Quick Guide to NZ Macrophytes</i>. E taea ngā ākongā te wānanga i o rātou ake kawenga i te oranga o ngā awa. E taea hoki te hanga i tētahi rauemi ake e whakaatu ana i ngā tipu mōkitokito mā te whakamahi i te rauemi <i>Macrophytes Associated with Inanga Spawning</i> ki te kōpaki <i>Resources for Curriculum Links / Macrophytes and Algae</i>.</li> <li>3. Tāutu i ngā momo nō Aotearoa me te whakaturite ki ētahi atu ika pērā i te inanga (whitebait) Mā te rangahau ngā ākongā e āwhina ki te whakarārangi i ngā ika taketake ki Aotearoa. Mā te mahi a roopu e taea ai ngā ākongā ki te whakaturite i ngā momo ika taketake ki nga momo ika nō wāhi kē atu. Ka whakaatu ia roopu i ngā kōrero kua rangahau ki te akomanga mā te panui ataata, whakaaturanga hiko rānei.       <ol style="list-style-type: none"> <li>a) Ka taea te whakarooopu i ngā tuaiwi-kore mōkitokito ki o rātou āhua tūtohu me te tāutu i ngā momo rerekē.(e 3 katoa) Tirohia te rauemi <i>Wai Care Invertebrate Field Guide Identification Sheet (WIMP ID Booklet)</i> ki te kōpaki <i>Resources for Curriculum Links</i>. Mā tēnei e whakarooopu ai ngā tuaiwi-kore ki te āwhata 1-10, 1= iti rawa te tūtohunga tae noa ki te 10 = nui rawa te tūtohunga. Ka whakarooopu hoki i ngā tuaiwi-kore ki ngā tae, kākāriki = nui rawa, karaka = āhua tūtohu, whereo = iti te tūtohu. Mā ia ākongā e whiriwhiri kia 3 ngā tuaiwi-kore mai ia o ngā wāhanga whakarooopu me te tuhi i tētahi whakarāpopotonga e whakamārama ana i te taupori tauaiwi-kore ki roto i te awa. Ki raro iho i te puka ngā whakamāramatanga mō nga nōhanga pai ki ngā tuaiwi-kore, ā ka whakatau</li> </ol> </li> </ol>
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			<p>mēnā he ōrite ki ngā nōhanga pai ki nga inanga. E taea te whakaatu i ngā mahi ki tētahi puka, ki tētahi whakaaturanga hiko rānei.</p> <p>b) Haerenga ki te awa: He pātai hei whakaarotanga mā ngā ākongā i a rātou e whakaaropu ana i ngā kīrehe i te haerenga ki te awa: He aha te kaute tūtohunga mō te tuaiwi-kore? Ki te kimi i tēnei momo ki te awa, he ana tōna whakamārama? He aha te āhua o te nōhanga pai ki tēnei momo? Ki hea noho ai tēnei momo i roto i te awa?</p>
<i>Papatūānuku</i>	Ka mārāma haere ki ngā āhuatanga nui o te mata o Papatūānuku, arā, te wai, te toka, te one, me ngā āhuatanga e taea ai te ora i reira.	<p>Wānangahia ngā rauemi o Papatūānuku e hāngai ana ki ngā ara wai.</p> <p>Te pānga o ngā toka parataiao ki te whakamahinga o te whenua.</p>	<p><b>Ngōhe:</b> Ka tāutu i ngā heiputanga i ngā wāhanga rerekē o ngā arawai me te whakamahinga o ngā wāhi me ngā rauemi o Papatūānuku.</p> <p><b>Ngā mahi:</b> He rauemi tautoko ki te kōpaki <i>Teaching Activities / Environment Investigators Resources &amp; Activities / Freshwater Ecosystems</i>.</p> <ol style="list-style-type: none"> <li>1. Ka hanga ngā ākongā i tētahi mahere (a pepa, a hiko rānei) e whakaatu ana i tētahi ara wai mai i ngā maunga tae no ki te moana me ngā tihoi awa hoki. <ol style="list-style-type: none"> <li>a) Ohia manomano me te matapaki i ngā momo whakamahinga mō te wai māori. Hei tauira: Ahuwhenua, whakatipu ngāhere, mahi pākihi, mahi ngāhau. Tāngia, tuhia rānei ki te māhere, ki ngā wāhi e whai pānga ana.</li> <li>b) Mahi takirua ki te tāutu i ngā rauemi mai i nga maunga tae no ki ngā whenua papatahi. Matapakia ngā whakamahinga o ngā rauemi i ngā wāhi rerekē.</li> <li>c) Ka whakahāngai i ngā whakamahinga o ngā rauemi ki ngā ara wai, ngā rauropi e noho ana ki ngā awa me ngā nōhanga a ngā inanga mā te matapaki ā roopu, ā akomanga rānei.</li> </ol> </li> </ol>
<i>Papatūānuku</i>	Ka mārāma haere ki ngā āhuatanga nui o te mata o Papatūānuku, arā, te wai, te toka, te one, me ngā āhuatanga e taea ai te ora i reira.	Whakamātauria ētahi momo toka o Te Tairāwhiti.	<p><b>Ngōhe:</b> Ka tāutu me te whakataurite i ngā momo toka o Te Tairāwhiti. Ka whakamārama i te pānga o ngā toka ki te āhua o ngā wai me te whakamahinga o ngā toka i ngā mahi whenua.</p> <p><b>Ngā mahi:</b> <i>In-class experiment:</i></p> <ol style="list-style-type: none"> <li>1. He nui ake te tūpono ka horo ētahi momo toka, ka memeha rānei i tētahi wairewa wai māori, ā ka kauehu te wai pātata. Ko ētahi toka he nui ake te tote, ngā kohuke, te waikawa, te pāpāhua rānei. Mā te whakamātau i ngā momo toka e kite ai te</li> </ol>

			<p>whānuitanga o ngā pānga o nga tūmomo toka ki te āhua o te wai me te whakamahinga o te whenua. Mā ngā ākonga e tūhura i ēnei āhuatanga, tirohia te rauemi <i>Solubility Experiment of Tairawhiti Geology</i>.</p> <p>He rauemi tautoko anō ki te kōpaki <i>Teaching Activities / Lesson Plan Activities / Experiment</i></p>
<i>Papatūānuku</i>	<p>Ka mārāma haere ki te hurihanga wai me ōna pānga ki te āhuarangi, te āhua o te whenua, me te koiora.</p>	<p>Whakamāramahia te ara wai.</p> <p>Describe a river catchment in this context.</p>	<p><b><i>Ngohe:</i></b> Ka ako haere i ngā whakamāramatanga mō te huringa wai. Ka mōhio ki te tā i ngā wāhanga o te huringa wai me te whakahāngai ki ngā rauropi, whenua me te āhuarangi o tētahi ara wai.</p> <p><b><i>Ngā mahi:</i></b> He rauemi tautoko ki te kōpaki <i>Teaching Activities / Lesson Plan Activities / Water Cycles</i>.</p> <ol style="list-style-type: none"> <li>1. Ohia manomano ā akomanga i ngā mōhiotanga mō te tukanga huri wai. Whakatau i ngā tūmomo wāhanga o te huringa wai me te whakamahi i ngā pere ki te kite i te raupapatanga.</li> <li>2. Ki te mārāma ngā ākonga ki ngā āria o te huringa wai (Whakaetonga, tukuwai, tōtāwairehu, tōtā) ka taea e rātou te tā ā ringa, ā hiko rānei i tēnei tukanga. <ol style="list-style-type: none"> <li>a) Ko tētahi wāhanga o te huringa wai ko te heke haere o ngā wai mā ngā kōawa, mā runga hoki i te whenua me te tāutu i ngā wāhi e pāngia e tēnei rerenga wai. Hei tauira, Inā he nui te tōtāwairehu, ka waipuke te whenua. Ka horo te whenua mēnā kāre he otaota teitei ki reira. Ka whakararu i ngā taha o ngā awa me ngā nōhanga toene, nōhanga ora a ngā inanga. Ka hua he hanga whenua hou pea, ka maha haere ngā kohinga one i te horonga o te whenua, ā ka ārai i te ara kauhoe a ngā ika. Ka taea e ngā ākonga te tuhi i ēnei momo kōrero ki runga i te pikitia, ka taea rānei e te kaiako te tārua, ā mā ngā ākonga ngā e whakapiri ki te pikitia.</li> <li>b) Inā he iti te tōtāwairehu me he kaha te whakaetonga ka raru ngā rauropi i te rerekē haere o te āhuarangi. Ka taea e ngā ākonga te tā/tuhi i ēnei kōrero me tētahi pene rerekē te tae. Hei tauira: Ka mate haere ngā otaota ki ngā taha awa, na tēnā ka uua mō ngā hua inanga, me ētahi atu rauropi te ora pai i te korenga o ngā wāhi haumaruru.</li> </ol> </li> </ol>
<b>Ō Ahupūngao</b>			

<p><i>Te Tōpana ne te Nekehanga</i></p>	<p>Ka tūhura, ka whakamahi i te tauira pūtaiao hei whakaatu i te tōpana me te nekenga, me ētahi whakamahinga.</p>	<p>Ngā tai o te koanga me te whakamahinga o te matakahi tote.</p> <p>Te whakawhitinga pūngao mai i te moana ki ngā awa.</p>	<p><b>Ngohe:</b> Ka wānanga i te ngā momo tai me te pānga o te mārāma ki ngā tai o te kōanga. Kia mārāma ki ngā pūtake o te pūngao me ngā panonitanga pūngao i ngā māwhitiwhiti kame.</p> <p><b>Ngā mahi:</b> He mahi ki rō akomanga.</p> <ol style="list-style-type: none"> <li>1. Ohia manomano ngā mōhiotanga mō ngā tai. Rangahau i ngā tōpana pā i te ao, te mārāma me te rā. Tirohia anō hoki ki te raeumi <i>Spring Tides</i> ki te kōpaki <i>Teaching Activities / Resources for Curriculum Links</i>.       <ol style="list-style-type: none"> <li>a) Whakahāngai i te pānga o ngā tai ki te huringa ora o te inanga. Hangaia tētahi huringa ora me te tāutu i te mea/matū ka kawea e ngā tai. Hei tauira: Ka kawea ngā tai i ngā hua ki te moana.</li> <li>b) Whakamārāma i te pānga o ngā tai ki te huringa ora o ngā inanga.</li> </ol> </li> <li>2. Tā i tētahi māwhitiwhiti kame e whakaatu ana i ngā rauropi huhua o ngā awa- ngā ika, manu, tuaiwi-kore, pūkohu, tipu mōkitokito. Tirohia te tauira <i>Freshwater Food Web</i> iki te kōpaki <i>Resources for Curriculum Links</i>. Ka tohua te hiranga o te inanga mā te hoatu ki waenga i te māwhiti kame.       <ol style="list-style-type: none"> <li>a) Mahi ā roopu ki te tāutu me te whakamārāma i te pūtaketanga o te pūngao. Hei tauira, He hanawiti tuna (ki te kōpaki <i>Resources for Curriculum Links</i>). Wānangahia ētahi atu tauira: Ka kaingia nga plankton e ngā inanga, ka whakawhiti te pūngao mai i te moana ki te punaha hauropi waimāori.</li> </ol> </li> </ol>
<p><b>Ō Kawekawe</b></p>			
<p><i>Ngā Āhuatanga me ngā Panoni Matū</i></p>	<p>Ka whakarōpū i ētahi matū mā te mātakitaki me te ine i ngā āhuatanga ōkiko, kawekawe hoki, pēnei i te kawea hiko, te kawea pōkākā, me te waikawatanga.</p> <p>Ka tūhura i ngā panoni pūmau me ngā panoni rangitahi o ētahi matū, tae atu ki te tauhohe</p>	<p>Ngā aromatawai me ngā mahi mātakitaki.</p>	<p><b>Ngohe:</b> Ka whakataurite i te hanga mātu me ngā āhuatanga ōkiko o ngā matū i kite, i ine i te haerenga tuatahi.</p> <p><b>Ngā mahi:</b> Ki rō akomanga, ki ngā haerenga hoki.</p> <ol style="list-style-type: none"> <li>1. Ka tuhia ngā ākongā i tētahi whakarāpopotonga e whakamārāma ai te hanga matū me ngā āhuatanga ōkiko i inea i te haerenga ki te awa. Ka taea te whakaatu i ngā raraunga me nga kōrero ki tētahi pūrongo, tūtohi, kauwhwata rānei kia kite i ngā paearu tino pai. pai, āhua pai, kāre i te pai.</li> <li>2. Ka whakaoti te tūhura i tētahi kohinga raraunga tuarua i te haerenga tuarua ki tētahi atu wāhanga o te awa. Ka inea ngā āhuatanga ōrite kia āhei te whakataurite o ngā kohinga raraunga e rua. Ka taea te whakapā atu ki ngā Kaipūtaiao o WBC kia mārāma pai ki ngā take e rerekē pea ngā whiwhinga. Ka tāpirihia ngā raraunga kohinga</li> </ol>

	matū o te waikuratanga.		tuarua ki te pūrongo, i te otinga ka hua he aromatawai mō te āhua o te wai i te awa. He rauemi tautoko, <i>Explanation of Scores</i> resource ki te kōpaki <i>Resources for Curriculum Links</i> .
<i>Te Whakamahī Pūmatū</i>	.Ka whakahāngai i ngā āhuatanga ōkiko, kawekawe hoki o ētahi tūmomo matū ki te whakamahinga hangarau, ki te tukanga māori rānei.	Te hiranga o ngā āhuatanga ōkiko, kawekawe ki te oranga o ngā ika	<p><b><i>Ngohe:</i></b> Ka whakataurite i te hanga mātu me ngā āhuatanga ōkiko o tētahi taiao waimāori me tētahi wahapū. Ka whakahāngai ki te whakamahinga hangarau me ngā tukanga māori.</p> <p><b><i>Ngā Mahi:</i></b> Ki rō akomanga, ki ngā haerenga hoki.</p> <ol style="list-style-type: none"> <li>1. Rangahau kia whai māramatanga mō ngā āhuatanga ka kitea i tētahi wahapū pērā i te pāmahana, pH, te memehatanga o te hāora, te maha o te tote me te hihikotanga. Ka whakataurite me te matapaki i ngā āhuatanga o te taiao waimāori, ngā raraunga i kohia i te haerenga tuatahi, me ngā āhuatanga o te wahapū.</li> <li>2. Rangahau me te whakataurite i ngā whakamahinga hangarau me te pānga ki ngā tukanga māori. Hei mahi: Ko te irrigation tētahi whakamahinga o te wai ēngari me iti te maha o te tote ki ro wai. He nui rawa te tote ki roto i ngā wai o te wahapū nō reira kāre i te pai ngā wai o te wahapū hei whakamahinga mō tenei hangarau. He tauira anō, hydroelectricity, drinking water.</li> </ol>

### Ngā Whāinga Tikanga ā Iwi: Taumata 3

Hononga ki te Marautanga Ngā Whainga Ako	Ngā Akoranga	Ngā ngohe me ngā mahi
Te Whakaritenga Pāpori me te Ahurea Ka whakamārama i ngā take e whakarite ai, e whakamahī ai	He mea nui kia tiaki i ngā nōhanga toene	<p><b><i>Ngohe:</i></b> Ka whakamārama i ngā ritenga me ngā ture e hāngai ana ki te hīi inanga me nga take e whakarite ai, e whakamahī ai ngā ture.</p> <p><b><i>Ngā mahi:</i></b> He mahi ki rō akomanga</p> <ol style="list-style-type: none"> <li>1. Ka mahi a roopu ki te rangahau:</li> </ol>

<p>hoki, te tangata i te ritenga me te ture.</p>		<p>He aha ngā ture mō te hopu inanga?  Ka pēhea ngā ture e ūruhina?  Ka pēhea ngā ture e panoni i te takanga o te wā?</p> <p>2. Tirohia te Mahere Proposed Gisborne Regional Freshwater Plan (PGRFP) me te wāhanga e whakahau ana kia tiaki i ngā nōhanga toene katoa. Ma ngā ākongā te mahere e pānui me te tāutu i ngā ritenga mē tēnei mahi.</p> <p>a) Ka tautu inā ka noho haumarū te wāhi e tūhura ana rātou i raro i ngā ritenga o te PGRFP. Ki te kore ka taea te rangahau me pehea e whakahaumarū i te wāhi. Hei tauira: Tuhi reta ki te kaunihera me te whakawhere ia rātou ki te tiaki i te wāhi tūhura. Mā tēnei ka mārāma ngā ākongā ki ngā tukanga whakarite ture e whai pānga ana ki ngā kaupapa whai take pērā i te oranga o ngā inanga.</p>
<p>Ka whakamārama i te rerekētanga o ngā mahi a ngā rōpū ahurea, ahakoa e whakaata tonu ana ēnei i ētahi pūtake ōrite.</p>	<p>Ka whakaritea ngā iwi māori he rāhui kia tiakina ngā inanga māori, ka whakakorengia e ngā iwi tuauru i ngā wā whakangau/hii i ētahi wāhanga o te tau.</p>	<p><b>Task:</b> Ka mārāma ki ngā rerekētanga o ngā mahi a ngā ahurea e hāngai ana ki te tiaki i ngā wai māori me ngā inanga. Ka mārāma ki ngā mahi e hāngai ana ki ngā ahurea me ngā mātāpono tiaki taiao.</p> <p><b>Ngā mahi:</b> He mahi ki rō akomanga:</p> <ol style="list-style-type: none"> <li>1. Matapaki a akomanga i te tikanga o te rāhui, he aha ētahi tauira, he aha ngā wa e whakamahi ana ēnei tikanga. Ka whai whakaaro ki te haepapa o te Kaitiakitanga.</li> <li>2. Ka rangahau i ngā tikanga kaitiaki a ngā ahurea o ngā iwi tuauru e tutuki ai te whainga orite. Hei tauira, ngā pānui haranga, ngā kaupeka o te tau e aukati ana ngā mahi hii/hopu/whakangau me te aukati i te kuhunga o ngā tangata ki ētahi wāhi.</li> </ol>
<p>Te Wāhi me te Taiao</p> <p>Ka whakamārama i ngā take me ngā huarahi e whakaatu ai te tangata i tōna hononga ki tētahi tino wāhi, ki tētahi tino taiao</p>	<p>Ki tā te tirohanga a te Kaipamu he puna wai te awa mō ngā kau, ki tā te tirohanga Pūtaiao ko te awa he nōhanga mō ngā awa.</p>	<p><b>Ngōhe:</b> Ka mārāma ki ngā tirohanga o ngā tangata rerekē me o rātou hononga ki tētahi wāhi e hāngai ana ki ngā rauemi wai.</p> <p><b>Ngā mahi:</b> He mahi ki rō akomanga:</p> <ol style="list-style-type: none"> <li>1. Whakawehea te akomanga ki ngā roopu e rua. Ka noho ia roopu hei māngai mō tētahi tāngata/roopu/pakihī/ahurea. Hei tauira: Mā tētahi roopu te tirohanga a te kaipamu, ka ohia manomano i ētahi kōrero whai take ki tō</li> </ol>

		<p>rātou tirohanga - ko te awa he puna wai mō nga kau, he wai whangai i nga tipu rānei, Mā tērā atu roopu te tirohanga a te Kaimātai Taiao - He nōhanga te awa, he awa hei tiaki, hei oranga mō ngā rauropi.</p> <p>a) Ētahi kaupapa kōrero: He aha ngā tirohanga a ngā roopu, he aha i pērā ngā whakaaro, he aha te whakamahinga o ngā rauemi, he aha te pānga ki te taiao.</p>
<p>Ngā Mahinga Ohaoha</p> <p>Ka whakamārama i ngā take me ngā huarahi e rerekē ai te titiro me te whakamahi a te tangata i te rawa me ngā putanga iho o ēnei āhuatanga.</p>	<p>I te matenga o ngā inanga i whakaaro na te kaha hii/hopu inanaga ēngari e mōhio ana ināinei he pānga nui te oranga o ngā nōhanga i te taiao ki te taha o ngā awa,</p>	<p><b>Ngōhe:</b> Kia mārama me whai mātauranga ki tika ngā whakatau e whakamahi ai nga rauemi - ngā awa, ngā kōawa, inanga.</p> <p><b>Ngā mahi:</b> He mahi rangahau ki rō akomanga:</p> <ol style="list-style-type: none"> <li>1. Rangahau i ngā ture e whai pānga ana ki ngā rauemi wai me ngā whakatau, ngā take i whakarite ai ngā ture. Hei tauira: Te tiaki i ngā nōhanga toene i ngā tūkinotanga o ngā whenua tata ki ngā taiao o ngā awa. Arā - PGRFP / WPSFM.</li> </ol>
<p>Te Ao Hurihuri</p> <p>Ka whakaahua i ngā huarahi e tuhia ai, e maumaharatia ai ngā mahi o mua</p>	<p>Ka maumahata ngā kōrero o mua a ngā iwi māori i ngā pūrakau, waiata, whakairo me ngā mahi toi. I ngā ahurea o te tonga i tuhia te nuinga o ngā kōrero.</p>	<p><b>Ngōhe:</b> Ka whakataurite i ngā huarahi e maumahara ai nga kōrero o mua me te whakahāngai ki te wāhi</p> <p><b>Ngā mahi:</b> He mahi ki rō akomanga, he mahi kainga - uiui mātua, whānau:</p> <ol style="list-style-type: none"> <li>1. Ohia manomano, rangahau, uiui mātua/pakeke kia tūhura i ngā kōrero whai take mō te hītori o te awa me te whenua pātata ki te wāhi tūhura. He pakiwaitara, he waiata, he toi e whakaahua ana i te wāhi me ngā kōrero whakamārama i te hiranga ki te iwi māori.</li> <li>2. Ka rangahau ki runga i te ipurangi i ngā raraunga me ngā kōrero mō te wāhi tūhura. Hei tauira, Ngā raraunga mō te painga o te wai (Inā he raraunga i kohia e NIWA, GDC rānei), me ngā kōrero kē atu. Ka matapaki i ngā huarahi rerekē e pupuri ai ngā mātauranga a tēnā ahurea mō ngā whakatipuranga e whai ake.</li> </ol>

		He whānui ngā matapuna mō ngā mahi rangahau. Ko tētahi ko te puka Splendid Isolation – recent history.
<p>Te Whakaritenga Pāpori me te Ahurea -</p> <p>Ka whakamārama i ngā huarahi e whiwhi ai, e kawe ai hoki, te kaiārahi i tōna tūranga.</p>	<p>Mā te ako i ngā mātauranga mō te inanga me te whakarite i tētahi māhere mahi ka hono ai ngā roopu o te hapori kia kotahi ai te whakaaro e panoni ai ngā mahi o naianei</p>	<p><b>Ngohe:</b> Ka mahi ngātahi te akomanga, kura rānei kia ārahi i tētahi māhere whakaora inanga.</p> <p><b>Ngā mahi:</b> Ka noho ngā ākongā hei kaiārahi i o rātou tūnga kaitiaki. Ka ārahi i ngā whānau me te hapori ki te tautoko i te kaupapa hei oranga mō te katoa.</p> <ol style="list-style-type: none"> <li>1. I te mutunga o ngā mahi mō tēnei kaupapa ka whakaritea ngā ākongā i tētahi mahere mahi me te whakaraupapa i ngā tūmomo mahi e taea te whakaora, te whakapai i ngā nōhanga inanga. Ka whai pānga ki ngā roopu o te hapori i te mea he hiranga nui te wai, te awa me ngā rauemi ki te whānau whānui. Hei tauira, He rā whakatō rākau.</li> </ol>
<p>Te Wāhi me te Taiao</p> <p>Ka whakamārama i ngā whaiwāhitanga me ngā mātātaki o te torotoro mō te tangata, te wāhi me te taiao.</p> <p>Understand how exploration and innovation create opportunities and challenges for people, places, and environments.</p>	<p>Te whakamahinga o te hangarau kia whakapai i te punaha hauropi o te awa kia rite pai ngā nōhanga toene mō ngā inanga</p>	<p><b>Ngohe:</b> Ka tāutu i ngā wero me ngā mea angitū e whai pānga ana ki te wāhi tūhura, te taiao me ngā tangata e whai wāhi ana ki te kaupapa.</p> <p><b>Ngā mahi:</b> He mahi ki rō akomanga</p> <p>Ka mahi a roopu ki te tāutu i ngā wero me ngā mea angitū mō ngā tangata, te wāhi tūhura me te taiao. Hei tauira: Te whakamahinga o ngā tākakau pēre ki ngā wāhi kāre i te tino pai hei wāhi whakawhānau inanga.</p>
<p>Te Ao hurihuri</p> <p>Ka whakamārama i ngā huarahi e taea e te takitahi me te rōpū te urupare ki te panoni.</p>	<p>Ko te wero - Ka pēhea e whakaora ai ngā nōhanga inanga? Mā te māhi ā roopu e panoni ai ngā āhuatanga e roroku ai ngā inanga.</p>	<p><b>Ngohe:</b> Ka tāutu i ngā wero ki te taha o te hapori me ngā urupare o ngā ākongā me ngā hapori ki te rorokutanga o ngā inanga.</p> <p><b>Ngā mahi:</b> Ngā mahi ki rō akomanga:</p> <ol style="list-style-type: none"> <li>1. Ohia manomano i nga wero ki ngā takitahi me ngā whānau o te hapori e hāngai ana ki te rorokutanga o ngā inanga.</li> </ol>



		<ol style="list-style-type: none"> <li>2. Ka tuhi he whakarapopotonga e whakahua ana i ngā mahi a ngā ākongā ki te hāpai i te kaupapa. Hei tauira: I whakawhiti kōrero ki o rātou mātua, whānau mō ngā āhuetanga e tūkinō ana i ngā nōhanga inanga.</li> <li>3. Ka mahi ā roopu me te whakaatu/pānui i ngā rāpopotonga. Ka tuhi kōrero mō ngā mahi a te akomanga/kura hei hāpai i te kaupapa. Hei tauira: Te kohi raraunga, te rangahau, te hanga pānui ataata, te tuhi pūrongo me te mahi ngātahi kia tutuki pai te mahere mahi.</li> </ol>
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### Ngā Whāinga Hauora: Taumata 3

Key Learning Areas Teaching and Learning Objectives	Inanga Korero	Ngā Ngohe me ngā Mahi
<p>Waiora - Haumarutanga</p> <p>Ka tautohu, ka whakamahi i ngā tikanga haumarū o roto i te kura, kia whaihua ēnei tikanga.</p> <p>Taiao - Hononga ki ētahi atu Taiao</p> <p>Ka whakaputa whakaaro mō te herenga o te tangata ki tōna taiao, te taiao hoki ki te tangata, me te whakarite rautaki kia pārekareka tonu ai</p>	<p>Ka mōhio ki te whakakii i nga pepa RAMS mō ia wāhi tūhura kia tāutu i ngā whakatūpatoranga me te whakatau rautaki kia pārekareka, kia haumarū tonu ngā tangata katoa.</p> <p>Ka rangahau i te pānga o te wai contaminated ki te oranga o te tangata.</p>	<p><b>Ngōhe:</b> Kia whakaoti i tētahi Pepa Arotake me te whakahaere i ngā (RAMS) ki te tāutu i ngā whakatūpatoranga, ka pehea aua āhuetanga e puta, ka aha ki te whakakore i aua āhuetanga.</p> <p><b>Ngā mahi:</b> He mahi ki rō akomanga:</p> <ol style="list-style-type: none"> <li>1. Ka mahi takitahi ngā ākongā ki te whakaoti i tētahi pepa RAMS ki te tāutu i ngā whakatūpatoranga mō te haerenga ki te awa. E toru ngā āhuetanga matua - ngā aitua a tinana, ngā āhuetanga o te taiao, ngā rawa. Ka tāutu i ngā whakatūpatoranga me ngā rautaki e haumarū pai ai ngā ākongā. Hei tauira, Whakatūpatoranga: Kāre he tangata e mātau ki ngā mahi. Rautaki Haumarū - Mā ngā tāngata kei a rātou ngā pūkenga te roopu e ārahi.</li> <li>2. Ka whakaoti ngā ākongā i tētahi tukanga tiaki mā te kohi haere i ngā kōrero whai take me ngā nama waea o ngā kaiwhakapā matua.</li> </ol>

ngā taiao mōna ake, mō te tangata hoki.		3. Ka rangahau i te pānga o te wai contaminated ki te oranga o te tangata, kia whai wāhi tēnei ki roto i te puka RAMS. He tauira <i>WBC INstream RAMS template</i> ki te kōpaki <i>Teaching Activities / Resources for Curriculum Links</i> .
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