

WHANAKETANGA 1a: PĀNGARAU



¹one to one counting strategies

²place value knowledge

³additive number pairs

⁴place value partitioning

⁵repetitive pattern

⁶position

⁷data set

Te Tino Wāhanga Pāngarau	Ngā Whāinga	
Te Tau (Te Mātauranga Tau me ngā Rautaki Tau)	<p><i>Ka whakaoti rapanga te ākonga, ka whakamārama otinga, e whai wāhi mai ana:</i></p> <ul style="list-style-type: none"> ngā rautaki tatau pānga-tahi¹ mō te tāpiritanga me te tangohanga. 	<p><i>He tauira ēnei o ngā āhuatanga me mātua mōhio te ākonga e tutuki ai tana whakaoti rapanga:</i></p> <ul style="list-style-type: none"> ngā tauoti mai i te 0 ki te 20, arā, ko ngā tohuta, ngā kupu tau, me te rahi o ngā tau te whakaahuhanga me te raupapa o ngā tau ngā tau rearua ki te 10 me ngā haurua e whai pānga ana te mātauranga uara tū² e hāngai ana, pēnei i ngā tauhono takirua³ o roto i te 5 me te 10, me ngā wāwāhitanga uara tū⁴.
Te Tauira me te Pānga	<ul style="list-style-type: none"> te hanga me te whakaroa tauira tāruarua⁵. 	<ul style="list-style-type: none"> te tautohu i te pūtaka o te tauira e tāruaruatia ana.
Te Ine me te Hanga	<ul style="list-style-type: none"> te whakatairite me te whakaraupapa i te rahi o ngā āhuatanga ine o ētahi mea e rua te whakarōpū taonga i runga anō i ngā āhuatanga o aua taonga. 	<ul style="list-style-type: none"> ēnei āhuatanga e taea ana te ine: te roa, te taumaha, te wā, te paemahana, me te utu te reo māmā hei whakatairite i ngā āhuatanga ine o ētahi mea ēnei momo āhuatanga māmā hei whakarōpū taonga: te rahi, te tae, te maha o ngā kokonga, ngā tapa, me ngā mata.
Te Wāhi, te Ahunga, me te Panoni	<ul style="list-style-type: none"> te whai me te hoatu tohutohu mō te neke te whakamārama i te wāhi noho o tētahi mea. 	<ul style="list-style-type: none"> ngā kupu ahunga māmā, pēnei i te whakamua, te whakamuri, te mauī, te matau, me ētahi noa atu ngā kupu whakaatu taunga⁶ māmā [pēnei i te tata, te tawhiti, te taha, te waenganui, te mua, te muri, me ētahi noa atu].
Te Tauanga	<ul style="list-style-type: none"> te whakarōpū raraunga māmā. 	<ul style="list-style-type: none"> ngā momo whakarōpūtanga e taea ana mō tētahi huinga raraunga⁷ māmā.

WHANAKETANGA 1e: PĀNGARAU



Te Tino Wāhanga Pāngarau	Ngā Whāinga	
Te Tau (Te Mātauranga Tau me ngā Rautaki Tau)	<p><i>Ka whakaoti rapanga te ākongā, ka whakamārama otinga, e whai wāhi mai ana:</i></p> <ul style="list-style-type: none"> ngā rautaki tatau māwhitiwhiti¹ me ngā rautaki tatau ake² mō te tāpiritanga me te tangohanga ngā rautaki whakarōpū³ mō te whakareatanga māmā ngā rautaki tohatoha ōrite⁴ mō te whakawehenga māmā. 	<p><i>He tauira ēnei o ngā āhuetanga me mātua mōhio te ākongā e tutuki ai tana whakaoti rapanga:</i></p> <ul style="list-style-type: none"> ngā tauoti mai i te 0 ki te 100 te tatau mawhiti-2, mawhiti-5, mawhiti-10, whakamua, whakamuri hoki ngā meka tāpiritanga ki te 10 me ngā tangohanga e whai pānga ana ngā tau rearua ki te 20 me ngā haurua e whai pānga ana te whakaatu paheko tau hei whārite ngā kupu, ngā tohu, ngā whakaahuhanga⁵, me te tikanga o ngā haurua me ngā hauwhā.
Te Tauira me te Pānga	<ul style="list-style-type: none"> te hanga me te whakaroa tauira raupapa āhuhanga⁶, tauira raupapa tau⁷ hoki. 	<ul style="list-style-type: none"> te tipu o te tauira raupapa me te pūmautanga⁸ o te tipu.
Te Ine me te Hanga	<ul style="list-style-type: none"> te whakamahi waeine aro kē⁹ hei ine i tētahi mea te whakamahi waeine aro whānuī¹⁰ māmā hei ine i tētahi mea ngā āhuetanga o ngā taparau māmā me ngā matarau māmā. 	<ul style="list-style-type: none"> ēnei āhuetanga e taea ana te ine – te hurihanga, te rōrahi/kītanga, me te horahanga te pūmautanga o te waeine te tāruarua¹¹ i te waeine hei ine i tētahi mea, kāore he āputa¹², kāore e inaki¹³ rānei te wāhi tīmata me te wāhi mutu o tētahi inenga ngā ingoa o ngā āhua ahu-2 māmā me ngā āhua ahu-3 māmā (pērā i te tapatoru, te tapawhā, te taimana, te porowhita, te tapawhā rite, te tapawhā hāngai, te pouaka, me te poi).
Te Wāhi, te Ahunga, me te Panoni	<ul style="list-style-type: none"> te whai me te hoatu tohutohu mō te hurihanga te tautohu i te whakaatanga, te hurihanga, te nekenga, me te whakarahinga o tētahi āhua māmā. 	<ul style="list-style-type: none"> te huri whakatekaraka, te huri kōaro, me ngā hurihanga hautanga māmā ngā āhuetanga ka noho pūmau i te panoni māmā.
Te Tauanga	<ul style="list-style-type: none"> te hanga me te whakamāori whakaari raraunga¹⁴ māmā, pēnei i te kauwhata whakaahua. 	<ul style="list-style-type: none"> te tatau raraunga whakarōpū¹⁵ hei whakaputa kōrero mō tētahi huinga raraunga te tikanga o te whakamahi whakaahua hei tohu raraunga.
Te Tūponotanga	<ul style="list-style-type: none"> te matapae me te whakamātau i ngā putanga e taea ana i tētahi pūāhua tūponotanga¹⁶ māmā. 	<ul style="list-style-type: none"> ngā take e puta ai āna matapae mō tētahi pāpono tūponotanga¹⁷ ngā rerekētanga o te putanga matapae me te putanga whakamātau.

¹skip count strategy²count on³grouping strategy⁴equal sharing strategy⁵representation⁶sequential geometric pattern⁷sequential number pattern⁸invariance⁹non-standard unit¹⁰standard unit¹¹repeating¹²gap¹³overlap¹⁴data display¹⁵category data¹⁶probability situation¹⁷probability event

WHANAKETANGA 2a: PĀNGARAU

¹part-whole strategies²additive partitioning³representation⁴tens frame⁵slavonic abacus⁶arrow diagram⁷additive pairs⁸approximate⁹reasonableness¹⁰estimation¹¹symmetry¹²data display¹³uncertain¹⁴event

Te Tino Wāhanga Pāngarau	Ngā Whāinga	
Te Tau (Te Mātauranga Tau me ngā Rautaki Tau)	<p><i>Ka whakaoti rapanga te ākongā, ka whakamārama otinga, e whai wāhi mai ana:</i></p> <ul style="list-style-type: none"> ngā rautaki wāwāhi tau¹ māmā mō te tāpiritanga me te tangohanga. 	<p><i>He tauira ēnei o ngā āhuatanga me mātua mōhio te ākongā e tutuki ai tana whakaoti rapanga:</i></p> <ul style="list-style-type: none"> ngā tauoti mai i te 0 ki te 1 000, me ngā hautau māmā ngā meka tāpiritanga ki te 20 me ngā tangohanga e whai pānga ana te raupapa hautau māmā mēnā he ōrite te tauraro.
Te Tauira me te Pānga	<ul style="list-style-type: none"> ngā tauira o roto i te wāwāhitanga tāpiripiri² o tētahi tau te whakaatu pānga māmā ngā tauira ka puta i te wāwāhi āhua. 	<ul style="list-style-type: none"> ngā tauira o roto i ngā momo whakaahuahanga³ tau, pēnei i te anga tekau⁴, te paparau, te anga pirepire⁵, me te rārangi tau ngā momo whakaahuahanga pānga (pērā i te hoahoa pere⁶ me te tūtohi) ngā tauhono takirua⁷ o roto i tētahi tau.
Te Ine me te Hanga	<ul style="list-style-type: none"> te hanga me te whakamahi taputapu ine, waeine hoki e whaitake ana te wāwāhi me te tāpiri inenga te whakaputa whakaaro mō te whaitakenga⁹ o tētahi inenga, i runga anō i ngā whakataunga tata¹⁰ ngā āhuatanga o ngā taparau whānui me ngā matarau whānui. 	<ul style="list-style-type: none"> te rahinga āwhiwhi⁸ o ngā waeine aro whānui māmā me te hononga ki te rahi o tētahi mea e tino mōhiohia ana (pērā i te roa o te whetoko me te rōrahi o tētahi ipu miraka) ngā hautanga māmā o tētahi waeine ngā momo tapatoru ngā kupu āhuahanga e hāngai ana (pērā i te akitu, te mata, me te tapa) ngā momo matarau (pērā i ngā poro me ngā koeko).
Te Wāhi, te Ahunga, me te Panoni	<ul style="list-style-type: none"> te tautohu ahunga matua te whakaatu taunga māmā te whakaata, te neke, me te huri i tētahi āhua māmā. 	<ul style="list-style-type: none"> ngā kupu whānui mō te ahunga me te taunga (pēnei i te uta, te tai, te rahaki, te tua, me ētahi noa atu) ngā ahunga matua o te kāpehu te hangarite¹¹ o tētahi āhua māmā.
Te Tauanga	<ul style="list-style-type: none"> te whakatakoto pātai māmā me te kohikohi raraunga e hāngai ana, hei whakautu i ngā pātai te hanga me te whakamāori whakaari raraunga¹² e hāngai ana ki ngā raraunga i kohia. 	<ul style="list-style-type: none"> te tikanga o te tuhi raraunga ki te tūtohi tatau te whakaputa kōrero mō ngā āhuatanga matua o tētahi huinga raraunga.
Te Tūponotanga	<ul style="list-style-type: none"> te reo māmā hei whakaahua i te tūponotanga o tētahi putanga. 	<ul style="list-style-type: none"> te ōrite, te rerekē, te rangirua¹³ rānei o ngā putanga o tētahi pāpono¹⁴ e taea ana.

WHANAKETANGA 2e: PĀNGARAU



¹part-whole strategy
²inverse operation
³representation
⁴repeating addition
⁵unit fraction

⁶unit of measurement
⁷compass
⁸right angle
⁹2-dimensional shape

¹⁰category data
¹¹discrete data
¹²ethical conventions

¹³scale
¹⁴probability event

Te Tino Wāhanga Pāngarau	Ngā Whāinga	
Te Tau (Te Mātauranga Tau me ngā Rautaki Tau)	<p><i>Ka whakaoti rapanga te ākongā, ka whakamārama otinga, e whai wāhi mai ana:</i></p> <ul style="list-style-type: none"> ngā rautaki wāwāhi tau¹ me te rautaki paheko kōaro² mō te tāpiritanga me te tangohanga ngā rautaki tāpiri tāruarua⁴ mō te whakareatanga māmā. 	<p><i>He tauira ēnei o ngā āhuatanga me mātua mōhio te ākongā e tutuki ai tana whakaoti rapanga:</i></p> <ul style="list-style-type: none"> ngā tauoti mai i te 0 ki te 10 000, me ngā hautau māmā ngā meka whakareatanga o te 2, te 5, me te 10, me ngā whakawehenga e whai pānga ana ngā kupu, ngā tohu, ngā whakaahuahanga³, me te tikanga o ngā haurua, ngā hauroru, ngā hauwhā, ngā haurima, ngā hauwaru, me ngā hautekau te raupapa hautau waetahi⁵.
Te Tauira me te Pānga	<ul style="list-style-type: none"> te whiriwhiri me te whakamahi i te ture o tētahi tauira māmā. 	<ul style="list-style-type: none"> te whakamahi tohu hei whakaatu i te ture o tētahi tauira.
Te Ine me te Hanga	<ul style="list-style-type: none"> te kōwhiri i ngā waeine⁶ e hāngai ana ki te horopaki me te tōtika anō o te inenga e whaitake ana te tuhi hoahoa me te hanga tauira o ngā āhua ahu-2⁹ me ngā āhua ahu-3. 	<ul style="list-style-type: none"> te whakamahi i te rūri, te tāporowhita⁷, me te koki hāngai⁸ hei ine, hei tuhi āhua.
Te Wāhi, te Ahunga, me te Panoni	<ul style="list-style-type: none"> te whakaatu ahunga, taunga hoki ki te mahere māmā te whai me te hoatu tohutohu haere huarahi te tautohu i ngā āhuatanga ka noho pūmau, me ngā āhuatanga ka rerekē i tētahi panoni. 	<ul style="list-style-type: none"> ngā taunga me ngā ahunga o ngā āhuatanga kōhure o tōna wāhi noho, pēnei i te maunga, te awa, te marae, te kura, me ētahi noa atu.
Te Tauanga	<ul style="list-style-type: none"> te raraunga whakarōpū¹⁰ me te raraunga motumotu¹¹ te whakaputa kōrero mō ngā whakakitenga o tētahi tūhuratanga tauanga. 	<ul style="list-style-type: none"> te tikanga o te whakaari raraunga ki te kauwhata pou māmā, me te kauwhata ira ngā tikanga matatika¹² e hāngai ana (pērā i ngā momo pātai e tika ana kia kore ai te kaiwhakautu e mamae, e whakaitia rānei).
Te Tūponotanga	<ul style="list-style-type: none"> te whakaatu tūponotanga ki tētahi āwhata¹³ te whakamāori whakaari raraunga māmā hei matapae i te putanga o tētahi pāpono tūponotanga¹⁴. 	<ul style="list-style-type: none"> te whakaatu putanga ki tētahi whakaari raraunga māmā (pērā i te kauwhata ira, te kauwhata whakaahua, me te kauwhata pou).

WHANAKETANGA 3a: PĀNGARAU

¹multiplicative strategy²additive pattern³geometric pattern⁴multiplicative partitioning⁵protractor⁶net⁷grid⁸ordered pair⁹continuous data¹⁰time-series data¹¹probability situation¹²theoretical outcome¹³experimental outcome¹⁴independent¹⁵dependent¹⁶mutually exclusive

Te Tino Wāhanga Pāngarau	Ngā Whāinga	
Te Tau (Te Mātauranga Tau me ngā Rautaki Tau)	<p><i>Ka whakaoti rapanga te ākonga, ka whakamārama otinga, e whai wāhi mai ana:</i></p> <ul style="list-style-type: none"> ngā tau ā-ira (kia kotahi te mati ā-ira) ngā rautaki whakarea¹ māmā mō te whakareatanga, te whakawehenga, me te whiriwhiri hautanga māmā o tētahi tauoti. 	<p><i>He tauira ēnei o ngā āhuratanga me mātua mōhio te ākonga e tutuki ai tana whakaoti rapanga:</i></p> <ul style="list-style-type: none"> ngā tauoti mai i te 0 ki te 100 000 me ngā hautau ngā meka whakareatanga ki te 10 x 10 me ngā whakawehenga e whai pānga ana te raupapa hautau māmā te tikanga o te whakaatu hautanga ā-ira, me te hononga ki ngā hautau noa.
Te Tauira me te Pānga	<ul style="list-style-type: none"> ngā tauira tāpiripiri², tauira whakarea māmā, me ngā tauira āhuahanga³, pānga hoki ngā tauira o roto i te wāwāhitanga whakarea⁴ o tētahi tau. 	<ul style="list-style-type: none"> te pūmautanga o tētahi ture hei whakaahua i tētahi tauira, tētahi pānga rānei.
Te Ine me te Hanga	<ul style="list-style-type: none"> ngā momo āwhata maha me ngā hautanga ā-ira o tētahi wāeine ngā raumata⁶ o ngā āhua ahu-3 māmā. 	<ul style="list-style-type: none"> te whakamahi i ngā momo taputapu ine whānui (pērā i te ine-koki⁵).
Te Wāhi, te Ahunga, me te Panoni	<ul style="list-style-type: none"> te tukutuku⁷, te takirua raupapa⁸, ngā ahunga matua, me ngā mahere māmā hei whakaatu taunga, huarahi hoki. 	<ul style="list-style-type: none"> ngā ahunga matua e whā o te kāpehu me ngā ahunga kei waenganui i ērā (pērā i te rāwhiti-mā-tonga) ngā tikanga o te whakaatu taunga ki tētahi pūnaha tukutuku.
Te Tauanga	<ul style="list-style-type: none"> te whakatakoto pātai e hāngai ana me te kohikohi raraunga hei tūhura i te pātai te raraunga motukore⁹ (pērā i te raraunga houanga¹⁰) te whakaputa kōrero mō ngā tauira, ngā ia, me ngā āhuratanga kōhure o tētahi huinga raraunga. 	<ul style="list-style-type: none"> te tikanga o te whakaari raraunga ki te kauwhata rārangi te āhua o te whakaaringa raraunga hei whakaatu i te ia, ngā tauira, me ngā āhuratanga kōhure o roto i ngā raraunga.
Te Tūponotanga	<ul style="list-style-type: none"> te tūhura pūāhua tūponotanga¹¹ māmā te whakaatu tūponotanga hei hautau māmā i waenganui i te kore me te kotahi. 	<ul style="list-style-type: none"> te whakatairite i ngā putanga matapae¹² me ngā putanga whakamātau¹³ o tētahi pāpono tūponotanga te wehe kētanga¹⁴, te whakawhirinaki¹⁵, te aukati¹⁶ rānei o ētahi pāpono e rua.

WHANAKETANGA 3e: PĀNGARAU



Te Tino Wāhanga Pāngarau	Ngā Whāinga		
	<p><i>Ka whakaoti rapanga te ākongā, ka whakamārama otinga, e whai wāhi mai ana:</i></p>	<p><i>He tauira ēnei o ngā āhuatanga me mātua mōhio te ākongā e tutuki ai tana whakaoti rapanga:</i></p>	
Te Tau (Te Mātauranga Tau me ngā Rautaki Tau)	<ul style="list-style-type: none"> ngā tau ā-ira (kia toru ngā mati ā-ira) ngā rautaki whakarea⁴ mō te whakareatanga, te whakawehenga, me te whiriwhiri hautanga o tētahi tauoti. 	<ul style="list-style-type: none"> ngā tauoti mai i te 0 ki te 1 000 000 me tua atu, me ngā hautau ngā hononga whānui o ngā meka matua pērā i te $3 \times 0.4 = 1.2$ te whakaawhiwhi¹ tauoti hei whakatau tata² i te otinga o tētahi paheko tau³ te raupapa hautau. 	<p>¹round ²estimate ³number operation ⁴multiplicative strategy</p>
Te Tauira me te Pānga	<ul style="list-style-type: none"> ngā rautaki taurangi⁵ māmā e hāngai ana ki tētahi tauira, ki tētahi pānga māmā rānei. 	<ul style="list-style-type: none"> te tikanga o te taurangi hei whakaatu i tētahi rahinga⁶ kāore e mōhiohia ana, me te whakamahinga o te pū (reta) hei tohu taurangi. 	<p>⁵algebraic strategy ⁶quantity</p>
Te Ine me te Hanga	<ul style="list-style-type: none"> te whakatau tata me te whiriwhiri horahanga māmā, rōrahi māmā te tuhi raumata⁷ o ngā āhua ahu-3 whānui. 	<ul style="list-style-type: none"> ngā waeine e tika ana mō te horahanga me te rōrahi, pēnei i te cm^2, te cm^3, te m^2, me te m^3 te whakamahi tukutuku⁸ hei whiriwhiri horahanga te whakamahi mataono rite⁹ hei whiriwhiri rōrahi. 	<p>⁷net ⁸grid ⁹cube</p>
Te Wāhi, te Ahunga, me te Panoni	<ul style="list-style-type: none"> te hanga me te whakamārama tauira ka hua mai i te panoni tāruarua¹⁰ ngā panoni matua e hua mai ai te mātātuhi¹¹ i tōna mātāoroko¹². 	<ul style="list-style-type: none"> ngā tikanga mō te whakamārama panoni (pērā i te pū me te koki o te hurihanga, te rārangi whakaata, te rahi me te ahunga o te neke, me te taurahi¹³ o tētahi whakarahinga māmā). 	<p>¹⁰repetitive transformation ¹¹image ¹²object ¹³scale factor</p>
Te Tauanga	<ul style="list-style-type: none"> te raraunga whakarōpū matatini¹⁴ te arotake i te whaihua o ngā momo whakaari raraunga¹⁶. 	<ul style="list-style-type: none"> te tikanga o te whakaari raraunga ki te kauwhata rautō¹⁵ me te kauwhata porowhita ngā tikanga matatika¹⁷ e hāngai ana (pērā i te tikanga kia noho matatapu ngā kaiwhakautu pātai o tētahi tūhuratanga tauanga). 	<p>¹⁴multivariate category data ¹⁵stem-and-leaf graph ¹⁶data display ¹⁷ethical conventions</p>
Te Tūponotanga	<ul style="list-style-type: none"> te reo me ngā whakaahuahanga¹⁸ whānui hei whakaatu tūponotanga. 	<ul style="list-style-type: none"> te whakamahi rārangi hautau hei whakaatu tūponotanga te hoahoa rākau hei whakaatu i ngā putanga o ētahi pāpono raupapa¹⁹. 	<p>¹⁸representation ¹⁹combined event</p>

WHANAKETANGA 4a: PĀNGARAU

¹multiplicative strategy²ratio³negative number⁴round⁵factor⁶multiple⁷algebraic equation⁸scale factor⁹scale diagram¹⁰rate¹¹3-dimensional¹²line symmetry¹³rotational symmetry¹⁴mean¹⁵median¹⁶range¹⁷mode¹⁸distribution¹⁹measure of central tendency²⁰stacked bar graph²¹fair²²bias²³probability event

Te Tino Wāhanga Pāngarau	Ngā Whāinga	
Te Tau (Te Mātauranga Tau me ngā Rautaki Tau)	<p><i>Ka whakaoti rapanga te ākongā, ka whakamārama otinga, e whai wāhi mai ana:</i></p> <ul style="list-style-type: none"> ngā rautaki whakarea¹ whānui mō te whiriwhiri ōrau, ōwehenga² māmā hoki hei whakaatu pānga rahinga. 	<p><i>He tauira ēnei o ngā āhuatanga me mātua mōhio te ākongā e tutuki ai tana whakaoti rapanga:</i></p> <ul style="list-style-type: none"> ngā tauoti me ngā tau hautanga ngā tikanga me te whakamahinga o te tau tōraro³ te whakaawhiwhi⁴ tauoti, tau ā-ira hoki ngā hautau ōrite (hautau, hautanga ā-ira, ōrau) ngā tauwehe⁵ me ngā taurea⁶ o tētahi tau ngā ōrau nui ake i te 100%.
Te Tauira me te Pānga	<ul style="list-style-type: none"> te whakaatu pānga māmā hei whārite taurangi⁷. 	<ul style="list-style-type: none"> te hua o te huri i tētahi taurangi me te pānga ki taurangi kē.
Te Ine me te Hanga	<ul style="list-style-type: none"> te whakawhitiwhiti waeine ngā inenga tapa me ngā ture hei tātai paenga, horahanga, rōrahi hoki o ngā āhua māmā te pāpātanga¹⁰ hei ine i tētahi mea (pēnei i te km/h hei ine i te tere) te whakaatu āhua ahu-3¹¹ hei hoahoa ahu-2 (pērā i te tuhinga hoahoa inerite). 	<ul style="list-style-type: none"> ngā momo tirohanga ki tētahi mea te whakamahinga o te ōwehenga me te taurahi⁸ hei tuhi hoahoa āwhata⁹.
Te Wāhi, te Ahunga, me te Panoni	<ul style="list-style-type: none"> ngā koki o te kāpehu hei whakaatu ahunga te hangarite panoni o tētahi āhua. 	<ul style="list-style-type: none"> te hononga o ngā koki ki ngā ahunga matua o te kāpehu ngā tikanga o te hangarite rārangi¹² me te hangarite hurihanga¹³ o tētahi āhua.
Te Tauanga	<ul style="list-style-type: none"> te whakatakoto pātai, tāpaetanga kōrero rānei hei tūāpapa mō tētahi tūhuratanga tauanga te whakatairite i te tuari¹⁸ o ētahi huinga raraunga te whakamahi wēanga¹⁹. 	<ul style="list-style-type: none"> te tātai toharite¹⁴, tau waenga¹⁵, inenga whānui¹⁶, tau tānui¹⁷ o tētahi huinga raraunga, me te whakaatu ki te whakaari raraunga te tikanga o te whakaari raraunga ki te kauwhata pou whakaapaapa²⁰ te tautohu i ngā taurangi o tētahi tūhuratanga tauanga, te kohikohi me te whakaari raraunga mō aua taurangi.
Te Tūponotanga	<ul style="list-style-type: none"> te tōkeke²¹, te haukume²² rānei o tētahi pāpono tūponotanga²³. 	<ul style="list-style-type: none"> te whakaatu tūponotanga hei ōrau.

WHANAKETANGA 4e: PĀNGARAU



Te Tino Wāhanga Pāngarau	Ngā Whāinga		
	<p><i>Ka whakaoti rapanga te ākongā, ka whakamārama otinga, e whai wāhi mai ana:</i></p>		
Te Tau (Te Mātauranga Tau me ngā Rautaki Tau)	<ul style="list-style-type: none"> ngā tau tōpū¹ me ngā tau hautanga (hautau noa, hautau ā-ira, ōrau) ngā rautaki tāpiripiri, whakarea hoki e hāngai ana ki ngā horopaki pānga riterite (pērā i te ōwehenga⁴ me te pāpātanga⁷ māmā). 	<p><i>He tauira ēnei o ngā āhuatanga me mātua mōhio te ākongā e tutuki ai tana whakaoti rapanga:</i></p> <ul style="list-style-type: none"> te taupū² māmā (pērā i te pūrua³ me te pūtakerua⁴) te tōtika me te whaitakenga⁵ o ngā whakataunga tata me ngā tātaitanga ngā huarahi e tino whaihua ana hei whakaoti tātaitanga i ngā horopaki maha. 	<p>¹integer ²exponent ³square ⁴square root ⁵reasonableness ⁶ratio ⁷rate</p>
Te Tauira me te Pānga	<ul style="list-style-type: none"> te whakaatu pānga hei kupu, hei tūtohi, hei kauwhata, hei whārite hoki. 	<ul style="list-style-type: none"> te whakamahinga o te āhuatanga kōaro⁸, te āhuatanga herekore⁹, me te āhuatanga tohatoha¹⁰ hei whakaoti whārite te tikanga o te tuaka pou, te tuaka pae, me te takirua raupapa hei whakaatu i te pānga o ētahi taurangi¹¹ ki te kauwhata te tikanga o te rārangi o tētahi kauwhata hei whakaatu i te pānga o ētahi taurangi e rua. 	<p>⁸commutative property ⁹associative property ¹⁰distributive property ¹¹variable</p>
Te Ine me te Hanga	<ul style="list-style-type: none"> ngā momo wātaka whānui te whiriwhiri i te rahi o tētahi koki. 	<ul style="list-style-type: none"> te tātai i te takanga o te wā te whakaatu wā-24 te tikanga o te koki whakahāngai¹², te koki whakarārangi¹³, te koki whakahuripū¹⁴, te koki tāhapa¹⁵, me te koki hāpūpū¹⁶. 	<p>¹²complementary angles ¹³supplementary angles ¹⁴conjugate angles ¹⁵acute angle ¹⁶obtuse angle</p>
Te Wāhi, te Ahunga, me te Panoni	<ul style="list-style-type: none"> te ōwehenga hei tātai taurahi¹⁷, hei tātai hoki i te rahi o tētahi mātātuhi¹⁸ whakarahi tētahi raupapatanga panoni¹⁹. 	<ul style="list-style-type: none"> te hua o te whakarahi āhua (pērā i te pānga ki te roa o ngā tapa, te horahanga me te rōrahi). 	<p>¹⁷scale factor ¹⁸image ¹⁹combined transformation</p>
Te Tauanga	<ul style="list-style-type: none"> te tātari i ngā whakakitenga o tētahi tūhuratanga tauanga te arohaehae i te tōtika o te tukanga kohikohi raraunga, me te whakaari i ngā raraunga o tētahi tīpako²², hei whakaatu i te āhua o tētahi taupori²³. 	<ul style="list-style-type: none"> te tikanga o te whakaari raraunga ki te kauwhata pou hiato²⁰ ngā tikanga matatika²¹ e hāngai ana (pērā i te whakamōhio atu ki te kaiwhakautu pātai i te whakamahinga o ngā raraunga ka puta i te tūhuratanga tauanga). 	<p>²⁰histogram ²¹ethical conventions ²²sample ²³population</p>
Te Tūponotanga	<ul style="list-style-type: none"> te whakatairite i te tuari²⁴ o ngā putanga matapae²⁵ me ngā putanga whakamātau²⁶. 	<ul style="list-style-type: none"> ngā take e taurangi²⁷ ai ngā putanga o tētahi whakamātau tūponotanga. 	<p>²⁴distribution ²⁵theoretical outcome ²⁶experimental outcome ²⁷variable</p>

WHANAKETANGA 5: PĀNGARAU



- ¹integer
²standard form
³number operation
⁴algorithm
⁵axis intercept
⁶slope
⁷formulae
⁸opposite angle
⁹corresponding angle
¹⁰alternate angle
¹¹intersecting lines
¹²parallel lines
¹³vector
¹⁴grid
¹⁵scale
¹⁶assertion
¹⁷box-and-whisker graph
¹⁸scatter plot
¹⁹data display
²⁰ethical conventions
²¹be biased
²²variable
²³multi-level
²⁴combined event

Te Tino Wāhanga Pāngarau	Ngā Whāinga	
Te Tau (Te Mātauranga Tau me ngā Rautaki Tau)	<p><i>Ka whakaoti rapanga te ākonga, ka whakamārama otinga, e whai wāhi mai ana:</i></p> <ul style="list-style-type: none"> ngā tau tōpū¹ me ngā tau hautanga te kōwhiri i te rautaki paheko tau³ e tino hāngai ana ki te horopaki. 	<p><i>He tauira ēnei o ngā āhuratanga me mātua mōhio te ākonga e tutuki ai tana whakaoti rapanga:</i></p> <ul style="list-style-type: none"> ngā tikanga me te whakamahinga o te tānga ngahuru² hei tohu i ngā tau tino nui, tino iti hoki ngā hātepe⁴ whakaoti paheko hautau.
Te Tauira me te Pānga	<ul style="list-style-type: none"> te whārite me te kauwhata rārangi hei whakaatu pānga. 	<ul style="list-style-type: none"> te tikanga o ngā haukotanga tuaka⁵ me te rōnaki⁶ o tētahi kauwhata rārangi, me te puta o ēnei i rō whārite.
Te Ine me te Hanga	<ul style="list-style-type: none"> ngā ture⁷ hei tātai tapa, paenga, horahanga, koki, horahanga mata, rōrahi hoki o ngā āhua whānui ngā tikanga koki o te rārangi pūtahi¹¹, te rārangi whakarara, me ngā taparau. 	<ul style="list-style-type: none"> te whakamahi i te ture a Pythagoras te tikanga o te koki tauroto, te koki tauaro⁸, te koki taurite⁹, te koki tauwhiti¹⁰.
Te Wāhi, te Ahunga, me te Panoni	<ul style="list-style-type: none"> te hangarite o ngā koki o ngā rārangi pūtahi, ngā rārangi whakarara¹², ngā taparau, me ngā matarau te whakaatu me te whakamārama panoni ki te papa kauwhata. 	<ul style="list-style-type: none"> te whakamahi pere¹³ hei whakaatu nekehanga te whakamahi mahere me ōna āhuratanga katoa (pērā i te tukutuku¹⁴ me te āwhata¹⁵) hei whakaahua huarahi.
Te Tauanga	<ul style="list-style-type: none"> te whakatakoto pātai, tāpaetanga kōrero¹⁶ rānei, te whakahaere tūhuratanga tauanga, me te whakaputa pūrongo te arotake i ngā kōrero ka puta i tētahi tūhuratanga tauanga te whakaputa kōrero mō te pānga o tētahi taurangi²² ki tētahi. 	<ul style="list-style-type: none"> te tikanga o te whakaari raraunga ki te kauwhata kauamo¹⁷ me te kauwhata marara¹⁸ te whaitake me te whaihua o ngā momo whakaari raraunga¹⁹ ngā tikanga matatika²⁰ e hāngai ana (pērā i te tikanga kia kaua e haukumea²¹ te āhua o ngā pātai).
Te Tūponotanga	<ul style="list-style-type: none"> tētahi pūāhua tūponotanga papa-maha²³. 	<ul style="list-style-type: none"> te tātai tūponotanga o tētahi pāpono raupapa²⁴.