Te Tukutuku Ako Pāngarau, Taumata 6-8 o *Te Marautanga o Aotearoa*

Kei hopu tōu ringa ki te aka tāepa, engari kia mau ki te aka matua

Ngā Whakaaro Whānui	Ngā Akoranga Tāpua i ngā Taumata 6-8 o *Te Marautanga o Aotearoa*		
	Taumata 6	**Taumata 7**	**Taumata 8**
Te Tukanga	E toru ngā tukanga matua o te pāngarau e kōtuitui ana, e honohono ana i te mātauranga me te horopaki: • ko te honohono tirohanga, mātauranga, mōhiotanga me ngā tukanga ki te waihanga kōrero whānui • ko te whakatenatena i te tāiringa kōrero, te auahatanga, te whakatauira me ngā matapae • ko te wānanga, te arotake arohaehae mā te whakaaro arorau, te tūhura, te tātari ki te waihanga whakataunga anō.		
Te Reo Matatini o te Pāngarau	Kei roto tonu i te reo Māori ōna ake kupu, ōna ake rerenga kōrero hei whakaahua i ngā ariā matua o te pāngarau. Āpiti atu ki tēnei, ko ngā tohu pāngarau me ngā momo whakaahuahanga pērā i te tūtohi me te kauwhata. Katoa ēnei āhuatanga ka kīia ko 'te reo matatini o te pāngarau'. Ka tipu ana te tamaiti, ka mātau haere ia ki te reo matatini o te pāngarau, koia hoki te huarahi matua e mārama ai ia ki ngā ariā pāngarau, e whakawhitiwhiti kōrero ai, e eke panuku ai ngā mahi. Ngā Akoranga Tāpua • *Ka whakawhitiwhitihia ngā ariā pāngarau mā te whakamahi i ngā āhuatanga wetereo motuhake e tika ana ki tēnā horopaki, ki tēnā tūāhua.* • *Ka whakawhitiwhitihia ngā ariā pāngarau mā ngā huarahi ararau (ā-tuhi, ā-waha, ā-whakaatu), me te whakamahi i ngā āhuahanga huhua, rerekē hoki. Tae atu ana ki ngā āhuahanga Māori motuhake hei whakaatu tōtika, auaha hoki i ngā ariā pāngarau.*		
Te Horopaki Ahurea, Pāpori	Ka whātoro atu te pāngarau ki ērā atu wāhanga ako o te kura, otirā, ki ngā kaupapa me ngā horopaki huhua o te whānau, o te hapū, o te iwi, o te hapori, o te ao Māori, e ahu whakamua ai tātou i ēnei tū kaupapa katoa. He mea nui kia mārama haere te ākonga ki ēnei tini take o te pāngarau. Ko ngā tāngata e whakamahi ana i te pāngarau, ka kōtuitui i te mātauranga me ngā tukanga pāngarau ki te reo pāngarau me ngā horopaki pāngarau. Me kākahu anō ngā whāinga paetae ki ngā momo horopaki e taunga ana te ākonga. Ki te mahi pāngarau ka whai tikanga o tēnā momo taupori, o tēnei taupori. He nui te honohono kei waenganui i te pāngarau me te ahurea. Ngā Akoranga Tāpua • *Ka tautohua ngā whakapae ahurea, pāpori e kawe ana i ngā horopaki me ngā tūāhua rerekē. Hei tauira, he aha ngā whanonga, ngā whakapono me ngā uara o ngā tāngata whai wāhi ki tēnei tūāhua pāngarau?* • *He aha ngā painga me ngā tūraru ki te tangata kotahi, ki te whānau e whai wāhi mai ana ki tēnei tūāhua pāngarau?* • *He pēhea tā te tangata whakauru i te pāngarau ki tēnei tūāhua hei whakatutuki i ngā matea o Papatūānuku?* • *Ka mātau ki te whaitake o te mātauranga Māori me te ahurea ki ngā tūāhua pāngarau.* • *Ka whakahoropakitia te tūāhua pāngarau. Hei tauira, ki ngā āhuatanga o ia rā, ki te kiriraurautanga, ki ngā wāhi mahi, ki te whakamanatanga, ki te ākitanga o ngā tatūnga whaikiko, e whanake ai, e tipu ai te ora o te tangata.* • *Ka kuhu te tauira ki ngā āhuatanga aroā ki te whakamāori i ngā hua me ngā otinga e hāngai ana ki te tūāhua pāngarau, tae atu ana ki te tika rānei o ngā tukanga kimi otinga i tētahi horopaki Māori.*		
Te Tau	Ngā Whakaaro Whānui **Ahurea:** Ka whai i ngā pūnaha ahurea hei whakariterite, hei whakaraupapa i ngā hanga motuhake. Ko te whakamāori anō i te reo motuhake o te pāngarau, ōna pūnaha tatau, ōna ingoa, ōna tikanga tatau, me te whakamahi i ngā āhuatanga wetereo o te Māori me te whai wāhi mai o te reo ā-iwi **Ngā** Whakaaro Whānui **Pāngarau:** Hangā ai ngā pūnaha tau hei whakarite i te maha o ngā rōpū rānei, o ngā taonga rānei, o ngā wāhanga o ngā taonga rānei. Whakamahia ai ngā tau me ngā waetahi hei ine, hei whakaahua i ngā āhua me ngā taonga hei rahinga ā-tau. Ko te whakamahi i tētahi tikanga hei tatau i ngā rōpū nui. Ngā Akoranga Tāpua • *Number systems are created to quantify sets, objects, and parts of objects, in response to increasingly sophisticated situations.* • *Understand and use rational and irrational numbers, powers and surds, and complex numbers.* • *Numbers and units are used to measure and express attributes of shapes and objects as quantities, to a degree of precision appropriate to the context.* • *Use, and calculate with, the units of measure in the metric system, including derived measures (e.g. speed, density).* • *Find the volumes/capacities of solids, including prisms, pyramids, and spheres.* • *Apply trigonometric ratios, and Pythagoras Theorem, to find unknown sides and angles in triangles.*		
Ngā Huringa me Ngā Pānga	Ngā Whakaaro Whānui **Ahurea:** Ahakoa te whenua, he nui nga momo tauira e haere ana. He nui hoki ngā pānga kei waenganui i tēnā, i tēnā āhuatanga o te taiao. Ngā Whakaaro Whānui **Pāngarau:** Ko te hononga kei waenga i ētahi taurangi e rua. Mā te kupu, mā te tūtohi, mā te whārite, mā te takirua raupapa, mā te kauwhata rānei e whakaatu te pānga o tētahi taurangi ki tētahi. Ngā Akoranga Tāpua • *Relative change in two or more variables can be represented using equations, tables of data, and graphs. These representations are used to make predictions and estimations for unknown values.* • *Relate graphs, tables and equations for polynomial, exponential, trigonometric, and logarithmic functions.* • *Relate the rate of change, the gradient, and derivative of a function.* • *Relate the area under a curve, and integration of a function.* • *Choose and apply differentiation, integration, and anti-differentiation techniques.*		

	• *Relationships among variables, within sequence of numbers and shapes, and within classes of shapes and datasets, can be represented algebraically, graphically and geometrically. The representations can be used to find unknowns.* • *Identify and apply the relationships among variables, including direct and inverse rates, arithmetic and geometric sequences and series.*
Te Āhuahanga	Ngā Whakaaro Whānui **Ahurea:** Ko ngā tikanga hei waihanga i te āhua rānei, i te hoahoa āhua rānei, hei wāhanga mō te taiao o te tangata. Tērā pea hei āhua rānei, hei hoahoa rānei mō tētahi wāhanga o te 'taiao ā-hinengaro' e tohungia ana ki ngā tikanga ahurea o te wā. Ko te torotoro i te taiao o te tangata me te whakariterite i ngā ariā me ngā tohu o taua taiao ki ngā tauira, ki ngā hoahoa, ki ngā whakaahua, ki ngā kupu, ki te aha, ki te aha. Ngā Whakaaro Whānui **Pāngarau:** Tautohua ai, māhitihititia ai ngā mea ka whai wāhi – āhua nei, tauira nei – ki ngā hanga, arā, ki ngā pānga nō roto i ngā āhua me ngā tauira, pērā me te hangarite me ngā panoni. Ko ngā pūnaha hei tautohu i te pūwāhi me te ahuahu o ngā taunga. Ngā Akoranga Tāpua • *Spatial objects, including shapes and patterns, can be defined and classified by their properties – that is, by the relationships between features of the shapes and patterns, including symmetries and transformations.* • *Compare the effects of multiple transformations, and analyse symmetrical patterns.* • *Explore patterns and relationships within shapes, space, and time* • *Systems for locating a particular point, including co-ordinate systems, enable the specification of position, the description of orientation relative to other points, and navigation from one point to another.* • *Use co-ordinate systems to represent loci, identify points and areas in common, and model conic sections.*
Te Ine	Ngā Whakaaro Whānui **Ahurea:** Ko ngā hanga hei tautohu i te maha kia pai ai te whakariterite me te whakaraupapa. Arā, ko te whakamahi i te tinana, i ngā taura/aho, i ngā taputapu motuhake hei ineine. Ko ngā pānga kei waenganui i te ahurea me te ine. Ngā Whakaaro Whānui **Pāngarau:** Ko te whakariterite me te whakaraupapa. Ko te roa, te whānui, te horahanga, te kītanga hoki. Ko te wā, te pāmahana, te taumaha. Ko te ahunga ake o ngā waeine. Ko ngā taputapu ineine. Ko te whakapae me te whakawhiwhi. Ngā Akoranga Tāpua • *Numbers and units are used to measure and express attributes of shapes and objects as quantities, to a degree of precision appropriate to the context.* • *Use, and calculate with, the units of measure in the metric system, including derived measures (e.g. speed, density).* • *Find the volumes/capacities of solids, including prisms, pyramids, and spheres.* • *Apply trigonometric ratios, and Pythagoras Theorem, to find unknown sides and angles in triangles*
Te Tauanga me te Tūponotanga	Ngā Whakaaro Whānui **Ahurea:** Te whakamārama i nga ritenga, ngā pūnaha whakarōpū, te whakamārama i ngā āhuatanga pāngarau o te ao. Ngā Whakaaro Whānui **Pāngarau:** Ko te kohikohi, te whakaatu me te tātari raraunga e pā ana ki tētahi kaupapa kia puta he māramatanga mō taua kaupapa, he arotakenga kia mōhiotia ai ngā āhuatanga whaihua me ngā āhuatanga kāore e tino whaihua ana. Ā, ko te tūponotanga he matapae, he ine rānei, mehemea ka hua ake tētahi āhuatanga, kāore rānei. Ngā Akoranga Tāpua • *A problem or situation can be explored by posing investigative questions, gathering appropriate data, representing and analysing the data, looking for patterns and differences, and reporting findings. Findings from the data are interpreted with a degree of uncertainty due to variability, particularly in sampling and measurement.* • *Pose questions that can be investigated by conducting experiments or surveys, or by using existing datasets.* • *Finding, using and assessing displays, measures, and models (e.g. linear regression, additive models for time series) to seek patterns and differences, and make predictions.* • *Make inferences about population parameters, from random sampling, including estimations and confidence intervals for means, and proportions.* • *Communicate findings of an investigation, using appropriate representations and models, and evaluate all stages of the inquiry cycle.* • *Evaluate statistical reports, with focus on sampling methods and margins of error, causal claims, and interpretations of risk.* • *The chance of an outcome occurring, can be represented by a probability, which is a measure from zero to one (0 - 100%), and used to make predictions about other events. Probabilities can sometimes be found theoretically, by using models, but are usually found by conducting experiments.* • *Investigate situations with elements of chance by comparing experimental distributions with theoretical models and distributions.* • *Calculate probabilities of independent, combined and conditional events, and expected values.*

I waihoa ngā whakaaro ‘akoranga matua’ i roto i te reo Pākehā mo te whakamātautau.

Kuputaka
waihanga kōrero whānui - generalisation
whakatenatena tāiringa kōrero - conjecture
whakatauira - modelling