

TAU 5-8

Hiko Pūhiko

Battery Power



TIROHANGA WHĀNUI

He pēhea te mahi a te pūhiko, ā, ka whakamahia mō te aha? Hangaia he pūtau pūhiko rēmana hei hōpara i te pūtaiao o ngā pūhiko i tēnei akoranga ngahau, ā-ringa hoki.

Ka huria e ngā pūhiko te pūngao matū hei pūngao hiko – kia rere ai ngā irahiko. I mua o te hangatanga o ngā pūhiko kāore i taea e te tangata te whakamahi pūrere kawē pērā i ngā rama, ngā waea me ngā EV. He āhuatanga hira hoki te pūhiko mō te pupuri hiko mai i te hiko kōmaru me te hau.

NGĀ HONO O TE MARAUTANGA O AOTEAROA

NGĀ WĀHANGA AKO:	NGĀ WHĀINGA PAETAE:	NGĀ TAUMATA:	NGĀ TAU:
Pūtaiao: Te ao matū: Mātauranga matū me te iwi whānui.	Kōrerohia ngā āhuatanga matū me ngā āhuatanga ōkiko rerekē i mātakina ki ngā whakamahinga hangarau rerekē me ngā tukanga tūturu.	3-4	5-8
Te āhua o te pūtaiao: Te tūhura i roto i te pūtaiao.	Me hanga me te whakahaere tūhuratanga matatini ake, tae atu ki te whakamahi tauira.	3-4	5-8
Ingarihi: Te Aroā Pānui: Ngā mōhihio.	Me whakamahi i ngā mōhihio ataata, ngā āhuatanga kuputuhi, me ngā āhuahira kuputuhi (hei tauira, ngā pae taha, ngā kuputoro, ngā hono ki ngā papakupu) kia mārama ai ki tētahi kuputuhi me te kimi i ngā mōhihio hāngai tāpiri.	Wāhanga 2	4-6

NGĀ MŌHIOHIO MĀ TE KAIKO:

Raupapa ako



TE WHAKAATU
MŌHIOHIO



TE TŪHURA ME TE
WHAKATEWHATEWHA



TE HANGA ME
TE WHAKAATU



TE WHAKAATA ME
TE WHAKAWHĀNUI



ME WHAITAKE

Ngā koronga ako

E ako ana ngā ākonga ki te:

- Tūhura i ngā wāhanga o tētahi pūhiko mā te whakatauiria me te whakamātau
- Tūhura he pēhea te mahi a tētahi pūhiko
- Whakataurite i ngā pūhiko ahuhwhānui me tētahi mea whakahiko

Paearu angitu

Ka taea e ngā ākonga te:

- Hanga he pūhiko mahi mai i tētahi rēmana
- Whakamārama mai he pēhea te mahi a tētahi pūhiko
- Whakarārangi i ngā ōritenga me ngā rerekētanga o ngā pūhiko ahuhwhānui me ngā mea whakahiko

Ngā rauemi e hiahiatia ana

- Kiriata: **Kiriata Hiko Pūhiko**
- Ngā rauemi mō te pūhiko rēmana (tirohia te whārangi 7)
- Ngā pūrere, urunga ipurangi

Ngā Tautoko Tāpiri

Ngā Tamariki Britannica: Tuhipānui pūhiko

Ngā Kupu

Pūhiko, hiko, hihiko, matū, irahiko, ngaohiko, whakahiko, pūngao, katote, kawehiko, waikawehiko, konukura, konutea, waea, ahuhwhānui, ara iahiko.

E tohu ana ngā kuputuhi miramira **karaka** i tētahi hono ki ētahi rauemi atu anō. Mēnā kua tāngia e koe tēnei rauemi, me hoki ki schoolgen.co.nz/for-teachers/resources/ hei toro atu ki ngā rauemi kua honoa.

WHEAKO AKO

Hiko Pūhiko

Kia mōhio: He whakaaro noa iho ēnei, ā, e whakatenatenahia ana ngā kaiako kia whakahāngaitia te mahi ki ngā hiahia me ngā kaingākau o ā rātou ākonga.



TE WHAKAATU MŌHIOHIO

He tata ki te 20 meneti

Te takamātau hiko

- Me takamātau he aha te ara iahiko, he aha te irahiko, ā, he pēhea te rere a te hiko. Arotakengia ngā akoranga a ngā ākonga mō ngā ara iahiko me te hiko, mā te **kiriata Ngā ara iahiko** (mai i te **Mahinga ara iahiko a School-gen**).

Ngā pūhiko me te hiko

- Matapakina he aha te pūhiko ka whakaatu i ngā tauira noa o ngā pūhiko. He maha ngā momo pūhiko, engari ko te nuinga o ngā pūhiko e tino whakamahia ana, pērā i te AA me te AAA, e mōhiohia ana he pūhiko matua, ahuhānui rānei. E aro ana tēnei akoranga ki ēnei pūhiko. He āhua rerekē te mahi a ētahi atu pūhiko.
- Tirohia ngā kiriata 1-9 o te **kiriata Hiko Pūhiko** hei whakaatu i ngā ariā:
 - he aha te pūhiko
 - ngā tauira noa o ngā pūhiko
 - he pēhea te whakamahi i ngā pūhiko i te ao o ia rā.



TE TŪHURA ME TE WHAKATEWHATEWHA

He tata ki te 15 meneti

Te tūhura he pēhea te mahi a tētahi pūhiko

Matapakina ngā whakaaro mō te mahi a tētahi pūhiko. Whakamāramahia mai he pēhea te hanga hiko a te pūhiko mā ngā tauhohe matū e rere ai ngā irahiko, ina tūhono ana ki tētahi ara iahiko.

Tirohia ngā kiriata 10-11 o te **kiriata Hiko Pūhiko** kia kite ai he pēhea te mahi a ngā pūhiko.

Hei whakaatu i ēnei whakaaro, ka taea te mahi tētahi pūtau noa, pūhiko rānei mā te whakamahi rēmana me ētahi taonga tāhiko taketake.

Tirohia te whārangi 7 mō ngā tohutohu me pēhea te hanga pūhiko rēmana.

TE WHAKAARO PĒRĀ I TĒTAHI TOHUNGA PŪTAIAO:

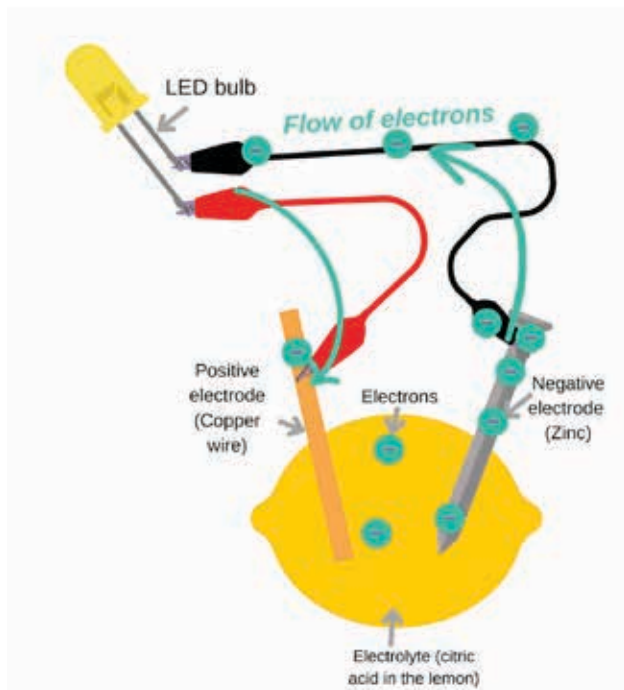
- He pēhea te mahi a tētahi pūhiko?
- He pēhea te huri o te pūngao i rō pūhiko mai i te āhua matū ki tētahi whana e rere ana?



He pēhea te mahi a tētahi pūhiko/pūtau rēmana

TE WHAKAARO PĒRĀ I TĒTAHI TOHUNGA PŪTAIAO:

- Kei te ahu mai te hiko i te rēmana?



Kāore i ahu te hiko i te rēmana! Ka neke ngā irahiko mai i te konutea i roto i te nēra, mā te ara iahiko ki te waea konukura.

E hiakai ana te waea konukura ki ngā irahiko, ā, he pai noa iho ki te konutea te hoatu noa i ana irahiko. Ina tūhono tētahi waea i waenga i ēnei mea e rua, ka rere ngā irahiko kua heipū ki te konutea ki te konukura.

He pēhea te whakaputu pūngao ki tētahi pūhiko tūturu

Nā te pūhiko ka taea e tātou te whakaputu hiko hei whakamahi ā muri ake. He āhua rite te whakamātau mō te mahi a te rēmana ki te mahi a tētahi pūhiko matua pērā i te pūhiko AA, ā, mā tētahi kawehiko tōraro, kawehiko tōrunga me te mehanga (waikawehiko).

He pito tōrunga me te tōraro tō ngā pūhiko. Ka neke ngā irahiko i rō pūhiko mai i te pito tōraro ki te pito tōrunga, kia pau katoa te tauhohenga matū.



TE HANGA ME TE WHAKAATU

He tata ki te 20 meneti

Hangaia he tauira o tētahi pūhiko

Mā te hanga tauira o tētahi pūhiko ahuwhānui ka āwhina i ngā ākonga kia mārāma ake ki te āhua o te mahi a ngā pūhiko. Ka taea te mahi tō tauira mai i te pokenga, te uku, te kerepeti, te uku maroke rānei.



I te tauira kei te taha mauī, ko te uku kikorangi te kawehiko tōrunga (ā-konutea i te nuinga o te wā). Ko te uku whero te kawehiko tōraro.

Ko te papanga kōwhai te waikawehiko e rere ai te iahiko mā te ara iahiko ka mutu ka noho hei whakawehe, e noho wehe ana ngā papanga whero me te kikorangi kia kore ai e tauhohe. Ko te waea te pine parāhe ka kitea i roto i ngā pūhiko ā-whare maha. Ka kohia e tēnei ngā irahiko, ā, ka wehe i te pūhiko i konei.

Ka taea hoki te tākai tō tauira ki te konumohe e whakatauirā ana i te ipu maitai o waho o te pūhiko.



TE WHAKAATA ME TE WHAKAWHĀNUI

He tata ki te 15 meneti

Arotake he pēhea te mahi a ngā pūhiko, ā, he pēhea tā tātou whakamahi i ō tātou ao.

Te whakataurite i ngā pūhiko AA whakahiko, matua hoki (whakamahi kotahi)

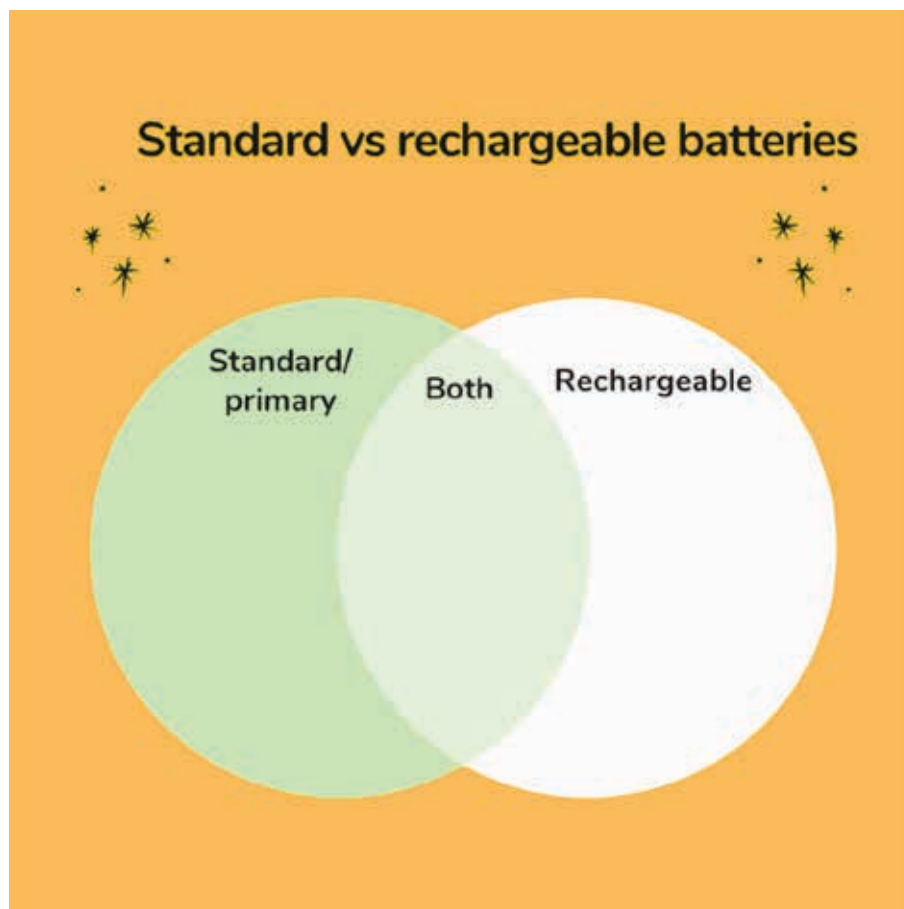
Matapakina te rerekētanga i waenga i ngā pūhiko matua noa me ngā pūhiko whakahiko.

Me mātaki i te ataata **He pēhea te mahi a ngā pūhiko** a Adam Jacobsen.

I tētahi pūhiko matua ka rere atu ngā irahiko katoa mai i tētahi kawehiko ki tētahi, ā, e kore mō te hoki atu. Ina tauhohea ngā papanga katoa kei te kawehiko tōraro, ka pakaru katoa, ā, kua kore e taea te whakahiko.

Ka taea e ngā pūhiko whakahiko te whakahoki i te hātepe whakahiko – te tango irahiko mai i te punahiko ka whakahoki atu ki te kawehiko tōraro ina whakahikotia. Ā tōna wā ka tīpokapoka ngā maitai, ā, kua kore e taea te whakahiko, i te nuinga o te wā i muri i ngā whakamahinga tini maha.

Whakaotihia tētahi whakaahua huinga me ngā ōritenga me ngā rerekētanga o ngā pūhiko matua/ahuwhānui me ngā pūhiko whakahiko. Tirohia te **kiriata 13-14** mō ngā whakautu ka taea.





ME WHAITAKE

He tata ki te 10 meneti

Te tukurua pūhiko

Ka taea te nuinga o ngā pūhiko te tukurua. Mā te tukurua pūhiko ka tino whaihua i ngā rawa puiaki, he haumarua ake ka mutu he āwhina ki te tiaki i ngā taiao tūturu.

Rapu kei hea ngā wāhi tukurua pūhiko i tō rohe i te **paetukutuku a Wasteminz**. He maha ngā taupuni para, ngā wāhi tiaki taiao me ētahi toa he putunga tukurua pūhiko ā rātou.

Ka whakaaetia e te nuinga o ngā whakaurunga tukurua ngā tūmomo pūhiko rerekē, engari he pai tonu te tiroiro i mua i te heri atu. Ki te makaia ngā pūhiko ki te ipu para ka puta pea ngā matū kino, otirā kei mura mai.

Te whakawhiti ki ngā pūhiko whakahiko

I te mōhio anō koe tata ki te 1000 ngā wā ka taea te whakamahi anō ngā pūhiko whakahiko?

Mahi Pāngarau

E hia te moni ka taea e koe te penapena mēnā ka hokona mai e koe ko ngā pūhiko whakahiko kua ko ngā pūhiko matua/ahuwhānui, mēnā he 1000 ngā whakamahinga ka taea?

Momo pūhiko	Ngā pūhiko pāpāhua ahuwhānui	Ngā pūhiko whakahiko
Utu mō ia pūhiko	\$2 te utu	\$8 te utu
Te maha o ngā wā ka taea te whakamahi	Kotahi te wā	Tata ki te 750 x
Utu mō ia whakamahi		

Whakautu

Whiriwhiria te utu mō ia whakamahinga pūhiko mā te whakawehe i te utu o te pūhiko mā te maha o ngā wā tapeke ka taea te whakamahi te pūhiko. Mō te pūhiko pāpāhua ahuwhānui he \$2 mō ia whakamahinga (\$2 ka whakawehea mā te 1), ā, mō te pūhiko whakahiko he tata ki te 1 ōrau mō ia whakamahinga (\$8 ka whakawehea mā te 750).

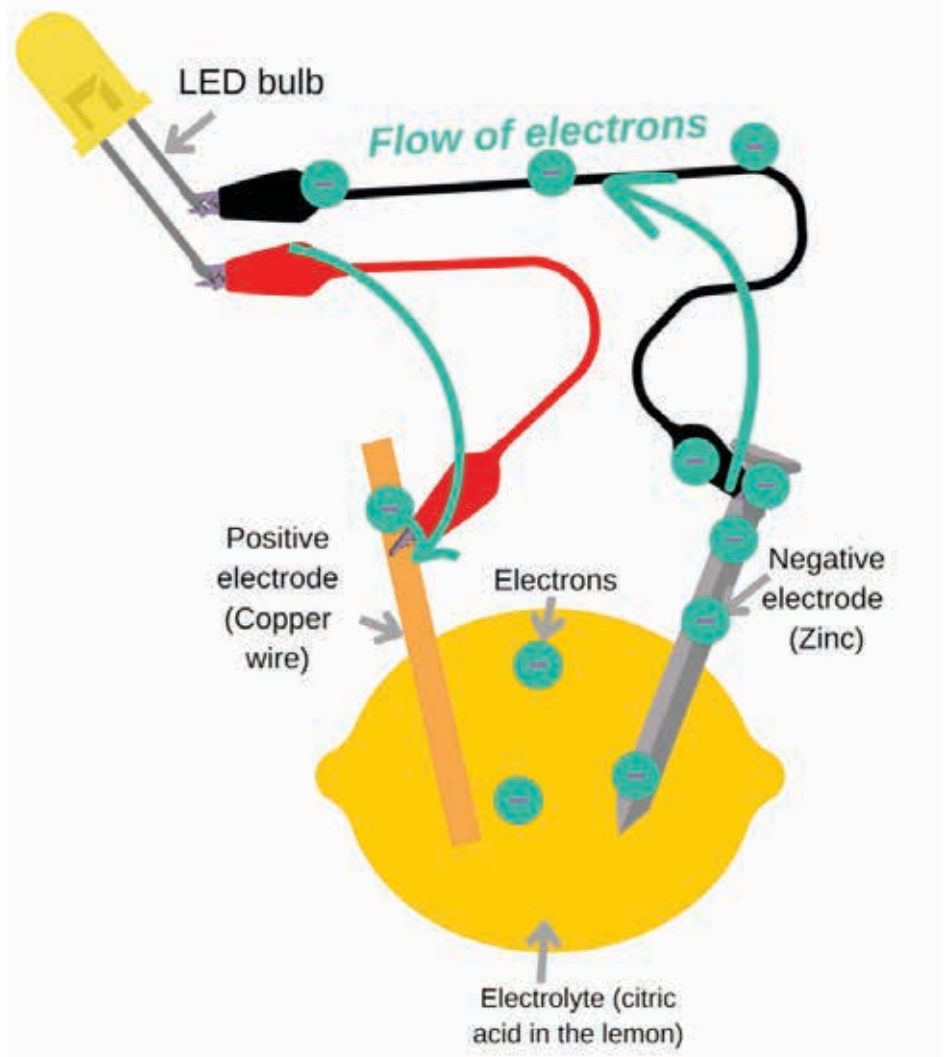
Kōrero whakakapi

Mēnā ka taea, me whakawhiti ki ngā pūhiko whakahiko- he iti ake te utu i te wā roa ka mutu he pai ake mō te taiao.

Me pēhea te hanga i tētahi pūhiko pūtau rēmana

Ngā mea me whiwhi koe:

- 2-3 ngā rēmana
- 3 x ngā nēra nui, ārai waikura (kiri konutea), korakora konutea rānei
- 3 - 9 waea konukura 1.5mm te mātotoru, ngā maramara konukura rānei
- Rama/pūrama LED iti (1.5 ngaohiko te mōrahi)
- Ngā rawhi ihuroa



Ngā tohutohu

Ngā upane	Tikanga
1	Me rōra ngā rēmana ki tētahi mata mārō hei wāwāhi i ngā wāhanga, kia puta ai hoki te wai- te waikawehiko waikawa. Kaua e wāhi i te kiri o te rēmana.
2	Raua tētahi nēra ārai waikura me ētahi waea konukura e rua ki ngā pito e rua o ia rēmana. Kia kaua rawa e pā tētahi ki tētahi ka mutu kei raro tonu i te mata.
3	Tūhonoa ngā rawhi ihuroa mai i ngā nēra ki te konukura hei hanga ara iahiko. Waiho he āputa i roto i te ara iahiko mō te rama/pūrama LED iti.
4	Raua te rama i roto i te ara iahiko me te pā o te pito roa ki te rawhi ihuroa e tūhono ana ki te waea konukura, ā, me pā atu te pito poto ki te rawhi ihuroa e tūhono ana ki te nēra konutea. Me mātua whakarite kei tino pā ngā rawhi ki ngā nēra, kāore ngā waea i te whitiwhiti.
5	Kua hangaia e koe ngā pūtau pūhiko rēmana, ka mutu me mumura tō pūrama! Mēnā karekau, me tāpiri anō he rēmana ki tō ara iahiko kia kaha ake ai te hiko hei whakakā i tō pūrama.

Ngā āwhina me te raparongoā

Kāore tō pūranga i te kā?

- Me mātua whakarite kāore tō nēra me te konukura i te pā tahi, ka mutu kāore ō waea i te whitiwhiti
- Mahia te whakamātau ki tētahi wāhi pōuri ake, me kapu rānei ō ringa i te rama i te mea he uaua pea te kite, otirā mēnā he rama whero
- He nui rawa pea te ngaohiko o tō pūranga, me nui ake rānei te hiko- arā, me nui atu ngā rēmana ki roto i tō ara iahiko! Whakamātauria kia nui ake ngā rēmana, me tūhonohono anō i te ara hātepe: konukura ki te konutea, aha atu, aha atu
- Me whakamaene i tō waea konukura me te nēra kia tino kitea ai ngā maitai
- Me whakamātau i ngā waea konukura mātotoru ake, ngā nēra nui ake hoki/rānei
- Me whakamātau i tētahi pūranga kē- tērā pea kua tūkinohia tāu, kua pakaru rānei
- Me whakamātau he rēmana kē: he mea waiwai me te hou, kua he mea tawhito, maroke rānei.

Whakamāramatanga

He rite te rēmana ki te pūhiko ina wehea ngā maitai rerekē e rua (he rite te konutea me te konukura ki te waikawehiko) kua wehea e tētahi wē waikawehiko (te wai rēmana). Kei te hiahia te konutea i roto i te nēra ki te tuku i ana irahiko ki te konukura, e rere ai ngā irahiko mā te waea, e kā ai te pūranga.

Ko te tūmanako i pārekareka ki a koe tēnei rauemi STEM mātauranga.

He kaupapa hapori nā Genesis a School-gen kia hihiko ai ngā kaiako, ngā tamariki me ngā whānau ki te STEM.

Mō ētahi rauemi koreutu atu anō tirohia tā mātou [paetukutuku Genesis School-gen](#) ka whai i a mātou i runga o Pukamata me Kapoata @schoolgennz