

TAU 5-8

Rama Whāomo Pūngao

Energy Efficient Lighting



TIROHANGA WHĀNUI

Tūhuratia ko ēhea ngā pūrama hiko tino whāomo ka tūhura i ngā mahi whaihua ka taea e tātou mā te kōwhiri i ngā pūrama whāomo pūngao.

NGĀ HONO O TE MARAUTANGA O AOTEAROA

NGĀ WĀHANGA AKO:	NGĀ WHĀINGA PAETAE:	NGĀ TAUMATA:	NGĀ TAU:
Pūtaiao:	Te Āhua o te Pūtaiao; te tūhura i te putaiao, te whakawhitiwhiti mā te pūtaiao, te whai wāhi atu me te tautoko atu. Te ao ahupūngao; te uiui ahupūngao me ngā ariā ahupūngao.	3-4	5-8
Ingarihi:	Te kōrero, te tuhituhi me te whakaatu.	3-4	5-8

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 ko ēhea ngā pūrama hiko tino whāomo pūngao: LED, ahuwānui/ratarata
- Kia mārara he iti iho te whakamahi pūngao a ngā pūrama hiko LED, he iti iho te utu, ā, he pai ake mō te taiao i ngā pūrama hiko ratarata.

Paearu angitu

Ka taea e ngā ākonga te:

- Whakamahi ā rātou tūhuratanga me ngā mōhiohio ka tukuna hei whakatau ko ēhea ngā pūrama tino whāomo me te kōwhiringa wā roa pai rawa.
- Tūtohu i te aho whāomo pūngao mō tō rātou kāinga, kura rānei.

Ngā rauemi e hiahiatia ana

- [Kiriata Rama whāomo pūngao](#)
- [Ataata whakaaturanga whakakā a-ringa](#)
- [Ataata whakanao hiko ā-tangata a te Pokapū pūtaiao](#)

Ngā Tautoko Tāpiri

- [Whārangitukutuku Kōwhiringa aho atamai a Kāinga Atamai](#)
- [Te Kōwhiri Rama LED Whāomo Pūngao | Whārangitukutuku a Gen Less](#)
- [Taupānga Light Bulb Saver](#) nā te Department of Environment and Energy, Ahitereiria.

Ngā Kupu

Rama, hiko, rauemi, whāomo, tīahoaho, pūrama hiko, ratarata, ahuwānui, LED, CFL, waeaho, waekaha, toitū.

WHEAKO AKO

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.

Ngā pātai ārahi mō te mahinga

- E hia te pūngao ka whakamahia e te rama?
- Ko ēhea ngā pūrama hiko tino whāomo pūngao?
- Ko ēhea ngā pūrama pai rawa mō tō akomanga, tō kāinga rānei?



TE WHAKAATU MŌHIOHIO

He tata ki te 15 meneti

Te hoko pūrama hiko

- Tukuna te tauari e whai ake:
Me whakaaro ngā ākonga kei te haere rātou ki te hoko pūrama hiko hou mō tō rātou akomanga, kāinga rānei. Ko te kōwhiringa ki a rātou kei waenga i tētahi pūrama LED me tētahi pūrama ratarata ahuwhānui. Ka puta i ngā pūrama e rua te aho e hiahiatia ana, engari ko tēhea te kōwhiringa pai rawa?
- Ka taea e ngā ākonga te tuku ō rātou ake mōhio mō te aho me ngā pūrama hiko. Whakaaturia ngā pānui whakaahua pūrama hiko kei te kiriata 3 o te **kiriata Rama whāomo pūngao** ki ngā ākonga. Matapakina ngā mōhiohio kei runga i ngā pānui whakaahua e rua.



60W **\$1** te utu

Pūrama hiko ahuwhānui
(Pūrama ratarata)

Whakamahi/whāomo pūngao

★ ★



7W **\$9** te utu

Pūrama hiko LED
(Ngōhiko Whakaputa Aho)

Whakamahi/whāomo pūngao

★ ★ ★ ★ ★

- Matapaki: He aha ngā āhuatanga e rua me whakaaroaro te tangata kia tau ai te kōwhiringa pai rawa i waenga i ēnei pūrama hiko e rua? Ko ētahi mea hei whakaaroaro pea i te kōwhiri i waenga i ngā pūrama e rua ko: te utu o te hoko i te pūrama, te whāomo pūngao, te utu o te whakahaere, ētahi atu utu wā roa, ngā tukunga waro, te porowhiu me ngā para ka puta, te roa e ora ai te pūrama (wā ora), muramura (he ōrite ngā tauira kei te pānui whakaahua mō ngā mea e rua), takawai i roto i te rūma (kāore e tino pai ki ngā mea LED te takawai), waekaha (W) me te maha atu!
- Kātahi ka tautuhi ngā ākonga me te hopu i ngā whakaarohanga hira ina whakatau ana ko ēhea ngā pūrama hiko tōtika mō tō rātou āhuatanga.



TE TŪHURA ME TE WHAKATEWHATEWHA

He tata ki te 10 meneti

- Tirohia te **ataata Whakaaturanga whakakā a-ringa** kia kite ai i ngā rahinga pūngao rerekē e hiahiatia ana kia kā ai tētahi pūrama ratarata ahuwhānui tēnā i tētahi pūrama LED.

Ko ētahi pātai pea ki ngā kaiwhakauru i a rātou e mātakitaki ana i te ataata:

- He ōrite te nui o te aho ka puta i ngā pūrama?
- Ka māmā ake te huri o te whakakā a-ringa ina whakakā ana i te pūrama LED/ahuwhānui?
- He nui ake te utu o te LED i te pūrama ahuwhānui, engari he 'whāomo pūngao' ake - e rima ōna whetū tēnā i te rua. He aha te tikanga o tēnei?

Ka kite koe he nui ake te kaha/pūngao mō te pūrama ahuwhānui/LED kia puta ai he aho tēnā i te pūrama LED. Me kaha ake te huri me te whakaputa kaha kia mahi ai te pūrama ahuwhānui tēnā i te pūrama LED. Nō reira, he 'whāomo pūngao' ake te pūrama LED i te mea he iti iho te pūngao ka whakamahia hei whakaputa i te aho ōrite.

TE WHAKAARO PĒRĀ I TĒTAHI TOHUNGA PŪTAIAO:

He aha ngā mea e kite ana koe mō te rahinga pūngao e hiahiatia ana hei whakakā i ia pūrama?

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.

Te whakataurite whānui i ngā pūrāma e rua

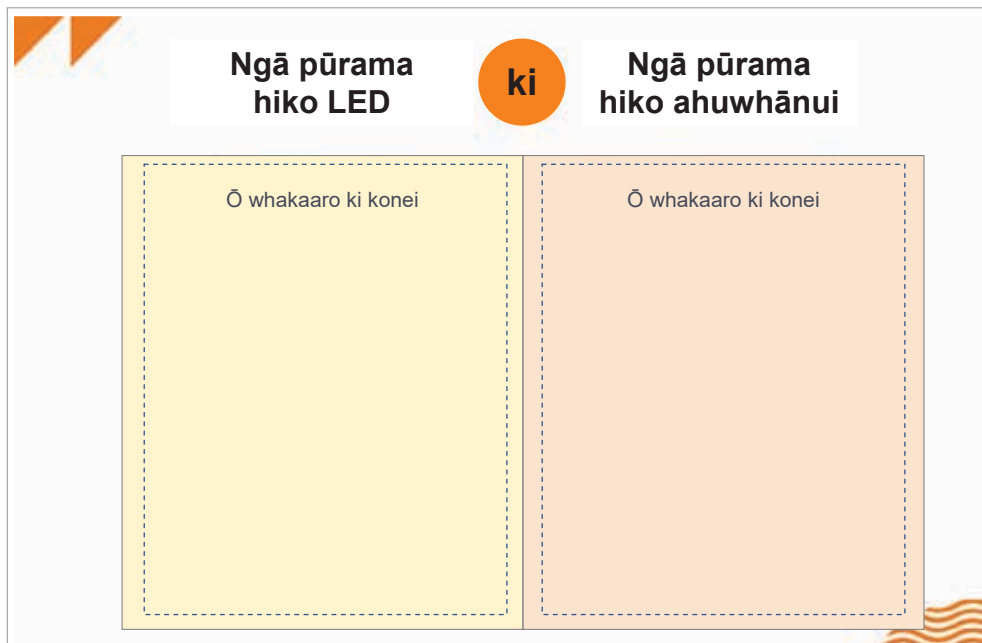
Me hoatu he kape o te **kiriata Rama whāomo pūngao** ki ngā ākonga. Kei roto ko ētahi mōhiohio atu anō mō ngā rerekētanga me ngā ōritenga i waenga i ngā pūrāma LED me te pūrāma ahuwhānui.

Te whakataurite i tētahi pūrāma ahuwhānui ki tētahi pūrāma LED	
 \$1 te utu Pūrāma hiko ahuwhānui (Pūrāma ratarata)	 \$9 te utu Pūrāma hiko LED (Ngōhiko Whakaputa Aho)
Ngā utu whakahaere i te tau: \$17.74/te utu	Ngā utu whakahaere i te tau: \$3.55/te utu
Whakamahi/whāomo pūngao ★ ★	Whakamahi/whāomo pūngao ★ ★ ★ ★ ★
Ngā tukunga waro: 477kg/i te tau	Ngā tukunga waro: 205kg/i te tau
Te wā ora o tēnei pūrāma hiko: Tata ki te kotahi tau	Te wā ora o tēnei pūrāma hiko: 10 tau +

Ko tēhea te
pūrāma ka
kōwhiria e
KOE?

Ka taea e ngā ākonga te tuhi ō rātou whakaaro ki te kiriata 8, te whakataurite i ngā momo pūrāma. He tauira o te pepa whakautu kei te **whārangi 8**.

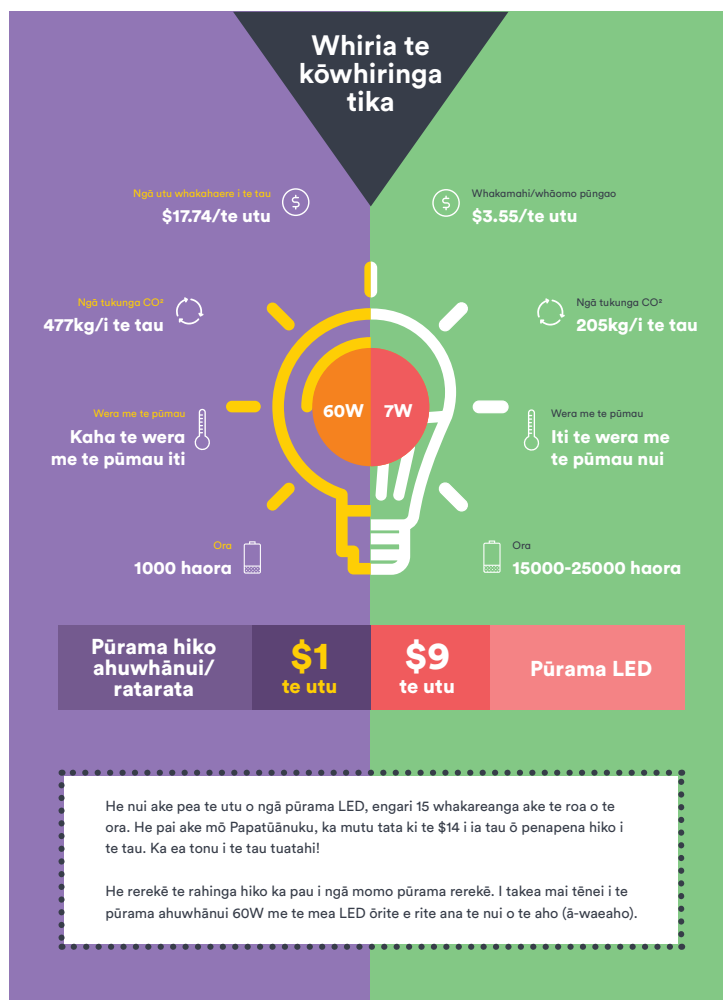
Te whakataurite i
ngā pūrama LED
me te ahuhānui
Tirohia te kiriata 8



TE HANGA ME TE WHAKAATU

He tata ki te 20 meneti

Me hanga e ngā ākonga ā rātou ake pānui whakaahua, ngā whakairoiro mōhiohio rānei hei tuku mōhiohio mō ngā kōwhiringa aho whāomo pūngao me te toitū. He tauira kei te taha matau.





TE WHAKAATA ME TE WHAKAWHĀNUI

He tata ki te 15 meneti

Ngā penapena wā roa me te whakataurite

He pēhea te pānga o ā tātou kōwhiringa ki a tātou anō me Papatūānuku i te wā roa?

Whakaaturia te tūtohi e whai ake (kiriata 5 o te **kiriata**) hei whakaatu i te nui o te pūngao, te para me te waro ka penapenatia e tētahi akomanga e whakawhiti ana ki ngā pūrama LED 10 mai i ngā pūrama ahuhwhānui. Neke atu i te 10 tau te wā o ngā penapena:

Ngā kōwhiringa mō ngā pūrama hiko tekau i te 10 tau		
Ngā āhuatanga	Ngā pūrama hiko ahuhwhānui katoa 	Ngā pūrama hiko LED katoa 
Te maha o ngā pūrama e hiahiatia ana	100	10
Utu (ngā pūrama)	\$100.00	\$90.00
Utu (hiko)	\$1774.00	\$355.00
Ngā tukunga waro	4,770kg CO²	2,050kg CO²
Para	90 ngā pūrama hiko ka porowhiau i muri i te whakamahinga	Kore para

Ngā pātai ki ngā ākonga:

- E hia te moni ka penapenatia mai i ngā utu hiko i te tekau tau mēnā i hokona mai ngā pūrama LED? (Whakautu: \$1774.00 - \$355.00 = \$1419.00)
- He aha ngā penapena tapeke i te tau? (Whakautu: \$1429.00)
- E hia ngā tana CO₂ ka penapenatia i ngā pūrama LED? (Whakautu: 2720 tana).

Te tuku whakatau whakamutunga mō ngā pūrama hiko

Me tuku ngā ākonga i ō rātou whakaaro ko ēhea ngā pūrama ka kōwhiria, ka tūtohua rānei e rātou hei whakamārama i tō rātou akomanga, kāinga rānei. Tonoa kia parahautia e rātou ā rātou whakatau e ai ki ngā māharahara ā-taiao, ngā utu me ētahi atu āhuatanga.



ME WHAITAKE

He tata ki te 15 meneti

Ngā penapena i te kāinga me te kura

- **Whiwhi mōhio atu anō** mō te nui o ngā penapena ka taea mā te whakamahi pūrama LED i tō kāinga, akomanga rānei.
- Kātahi ka tuhia e ngā ākonga ā rātou tūtohutanga whakamutunga mō ngā huringa ā-aho mō ō rātou kāinga, akomanga rānei.
- Me hoahoa me te tuhi i te takotoranga o tō kāinga, tō akomanga rānei ka whakaurua atu ngā pūtake aho me ngā pūrama hiko e whakamahia ana.
- Me rangahau aho kē atu ka hoahoa i tētahi akomanga he iti iho te whakamahi pūngao hiko mō te aho.
- Ā-akomanga, me whakaae tahi ka hanga i tētahi mahere ka pēhea te whakawhiti a te kura ki ngā aho whāomo pūngao i roto i te wā. Ka taea te whakaatu tēnei ki ngā kaiārahi o te kura mō tētahi ara mahi toitū.

Whakautu taurira mō te kiriata 8: **kiriata Rama whāomo pūngao**

Ngā pūrama hiko LED

ki

Ngā pūrama hiko ahuwhānui

Utu ngāwari – iti iho te utu whakahaere

Mahi wā roa

Whāomo pūngao

He iti iho te para

Iti iho te whāomo pūngao – 5% pūngao anake ka whakawhitia ki te aho

Iti ake te utu, engari he nui ake te utu i te wā roa (me te whakamahi pūngao)

He nui ake te para ka puta

He nui ake ngā tukunga waro

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

He kaupapa hāpori 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