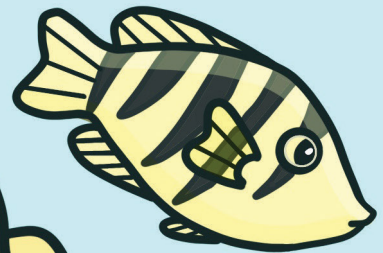
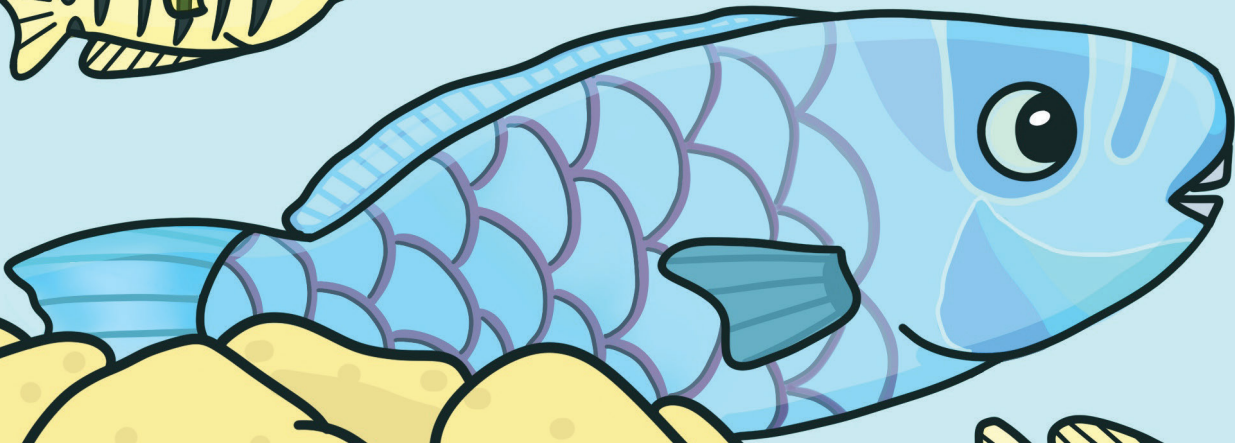


Nā I'a Hamulimu: Nā Mahi 'ai o ka 'Āpapapa

E ola nā ko'a
Puke Ha'awina a Puke Kala



Kaha ki'i 'ia na
Avery Williams

Unuhi 'ia na
Leilani Franco-Mar

‘O ke kahua ma mua, ma hope ke kūkulu.

First the foundation, then the building.

Learn all you can, then practice.

- Mary Kawena Pukui, ‘Ōlelo No‘eau #2459



He aha ia mea he ko'a?

Ka Pō'aiapuni Ola o ke Ko'a:

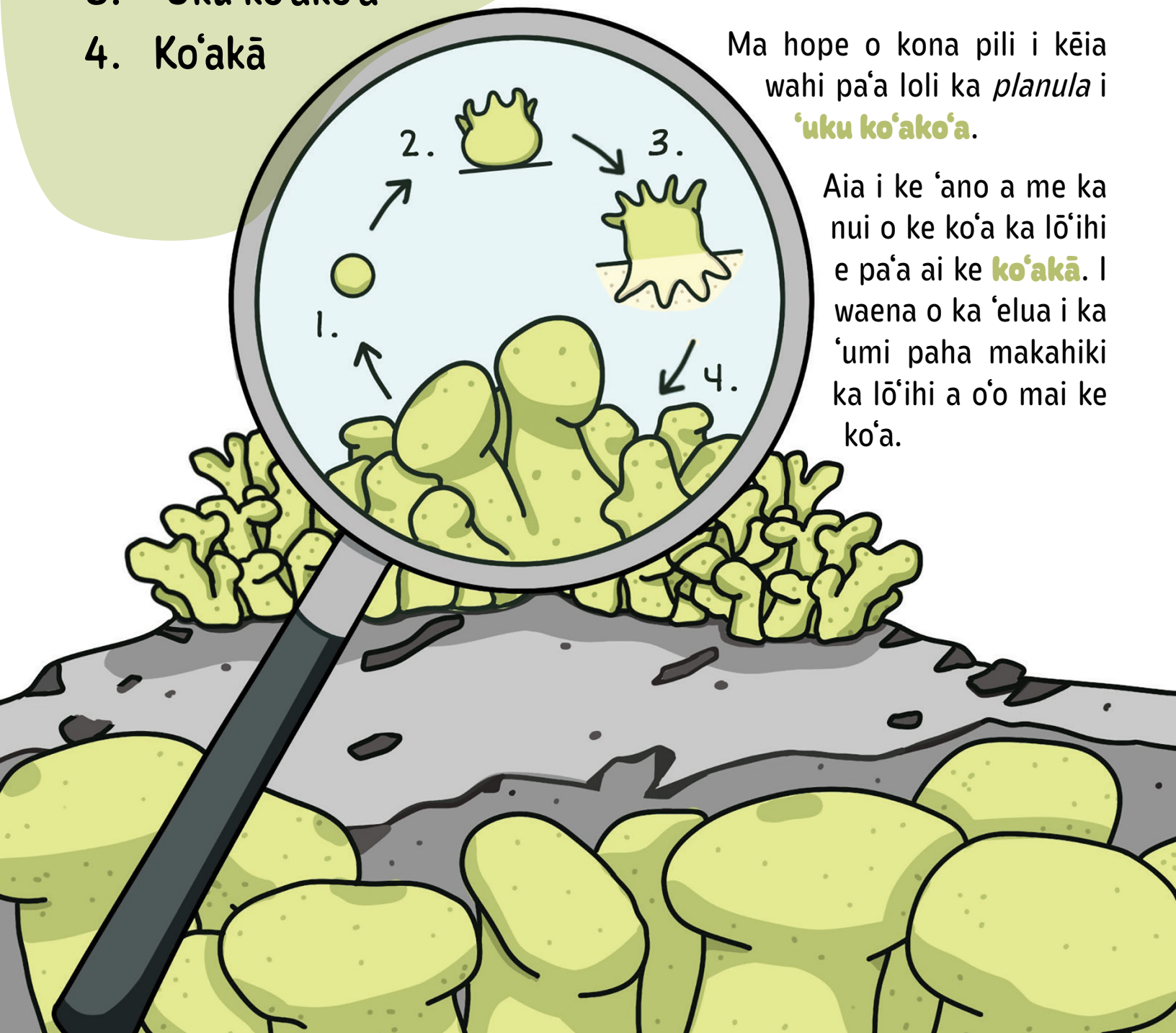
1. Piohē
2. Ho'okahua
3. 'Uku ko'ako'a
4. Ko'akā

'O ka wā mua o ke ola o ke ko'a ka wā **piohē**.

Ma ia wā, e 'imi ana ka piohē ko'a i kahi pa'a kūpono e noho a **ho'okahua** ai.

Ma hope o kona pili i kēia wahi pa'a loli ka *planula* i **'uku ko'ako'a**.

Aia i ke 'ano a me ka nui o ke ko'a ka lō'ihī e pa'a ai ke **ko'akā**. I waena o ka 'elua i ka 'umi paha makahiki ka lō'ihī a o'o mai ke ko'a.



Limu Ko'a

(Crustose Coralline Algae)

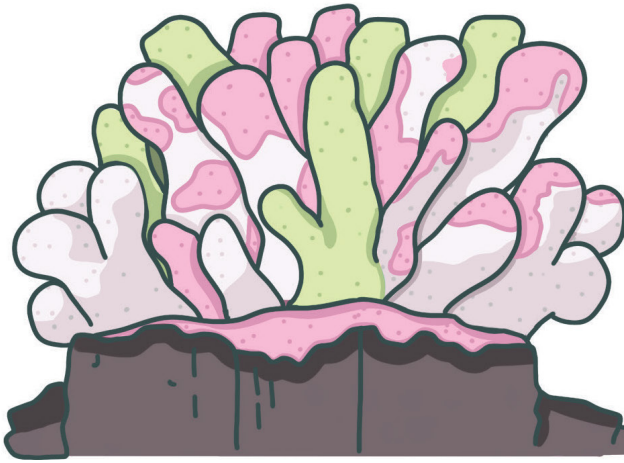
He līoho kūikawā ka limu ko'a. Kōkua 'o ia i ka 'āpapapa e ulu 'oiai lilo 'o ia i papa e pa'a a ulu ai ke ko'a.

He 'ākala, 'ula'ula, poni a i 'ole 'ōma'oma'o ka waiho'olu'u o ka limu ko'a.

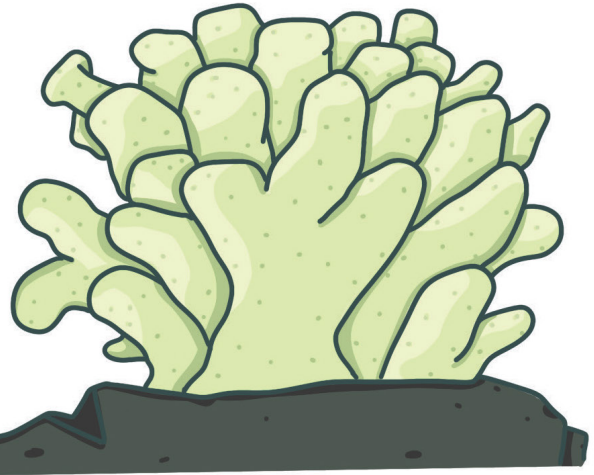


Pehea e 'imi ai i ka **limu ko'a**

E 'imi i ka līoho 'ākala pa'a ma luna o ke ko'a



Me ka limu ko'a



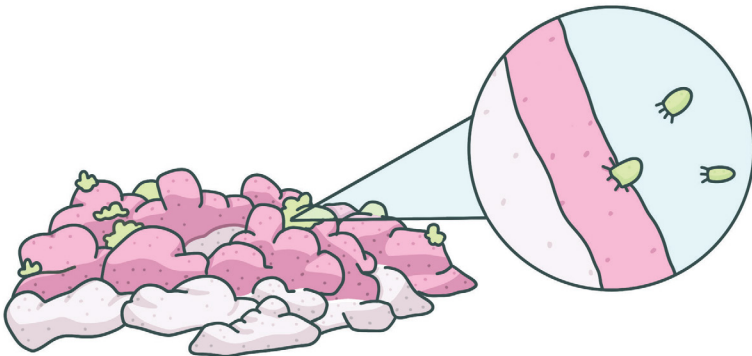
'A'ohe limu ko'a

Ko'iko'i ka **limu ko'a**?

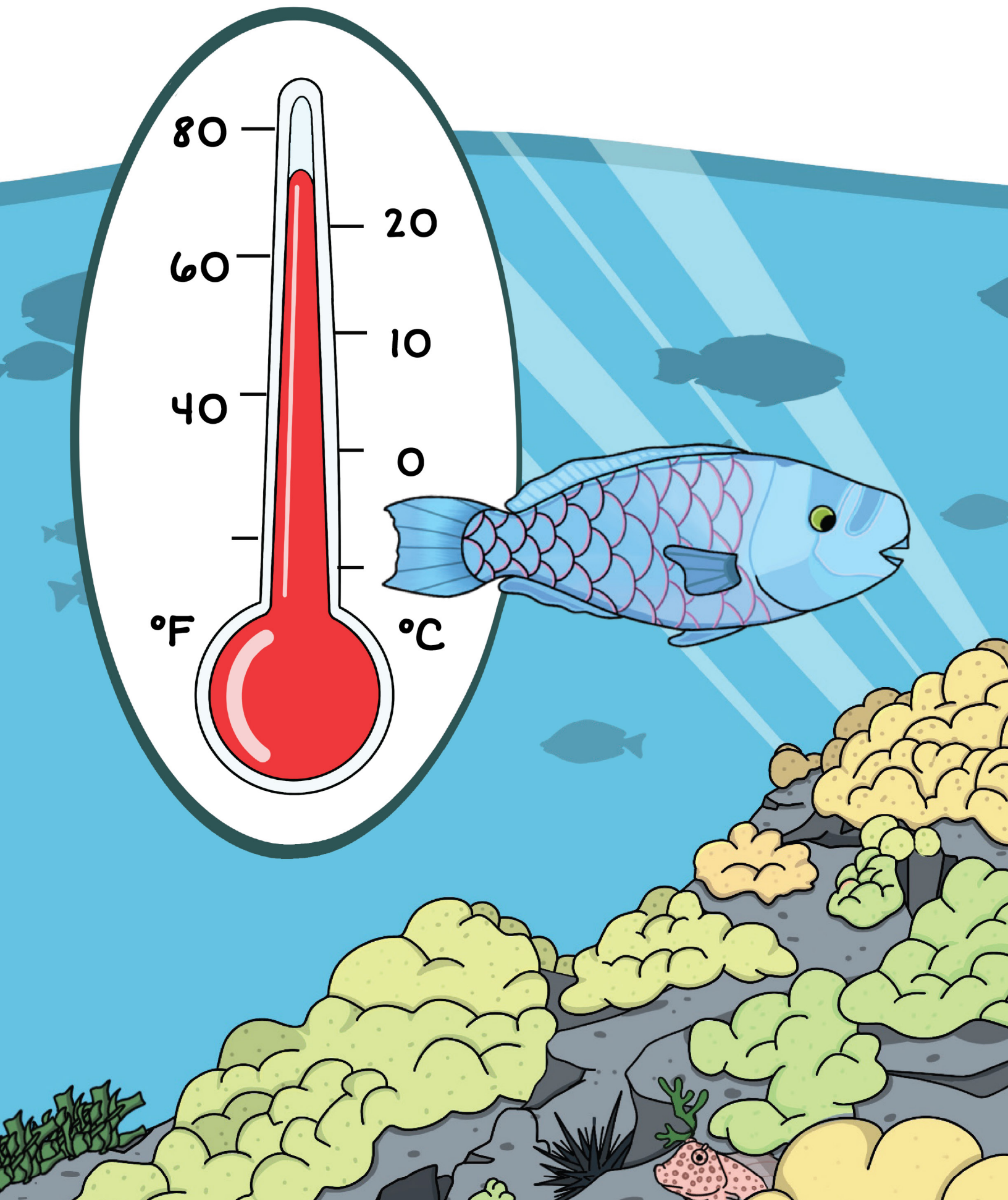
'Ume ka limu ko'a i ka piohē e kau a lilo i 'uku ko'ako'a.

Inā 'a'ohe limu ko'a, 'a'ohe wahi o ka piohē e kau ai a ulu! Kōkua pū ka limu ko'a i nā ko'a e pa'a pono kekahi i kekahi a lilo i 'āpapapa e nui a ikaika.

'O kekahi kuleana o ka i'a hamulimu 'o ia ka mālama 'ana i ka ma'ema'e o ka 'ili o ka limu ko'a i mea e ulu hou ai nā piohē.



E nānā i ke kau 'ana o ka piohē ma luna o ka limu ko'a ma ke aniani ho'onui 'ike!



Nā Mea e Ola Pono ai ke Ko'a

- 
- Ke kai ma'ema'e
 - Ka mehana kūpono
 - Ka mālamalama o ka lā
 - Nā i'a hamulimu

Na Iʻa Hamulimu

ʻAi nā iʻa hamulimu i ka limu a he kōkua kēlā i uluāhewa
ʻole ka limu a make ke koʻa.

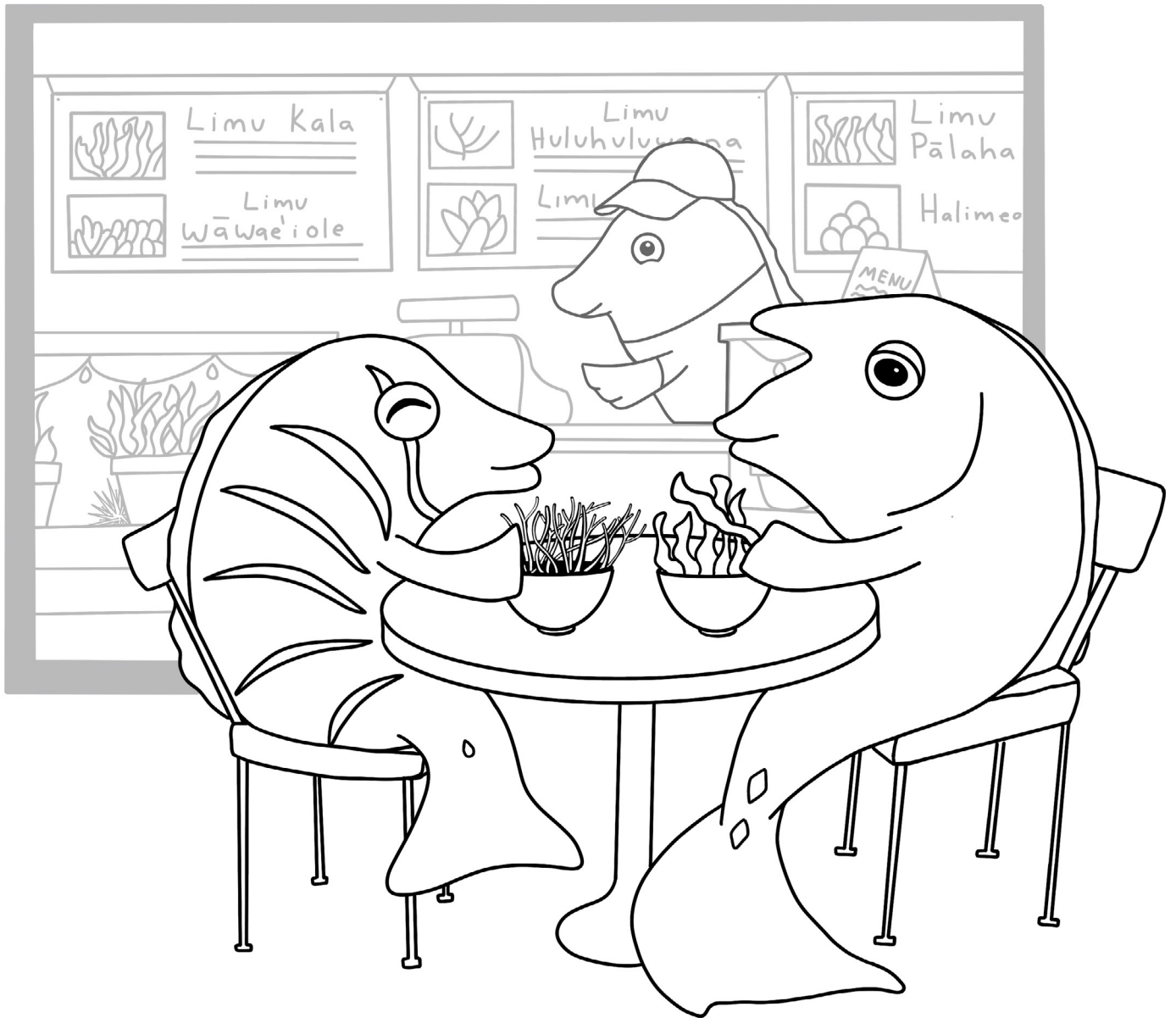
Hoʻomaʻemaʻe nā iʻa hamulimu i nā wahi a ke koʻa e ulu ai i
paʻa loa ka ʻāpapapa.



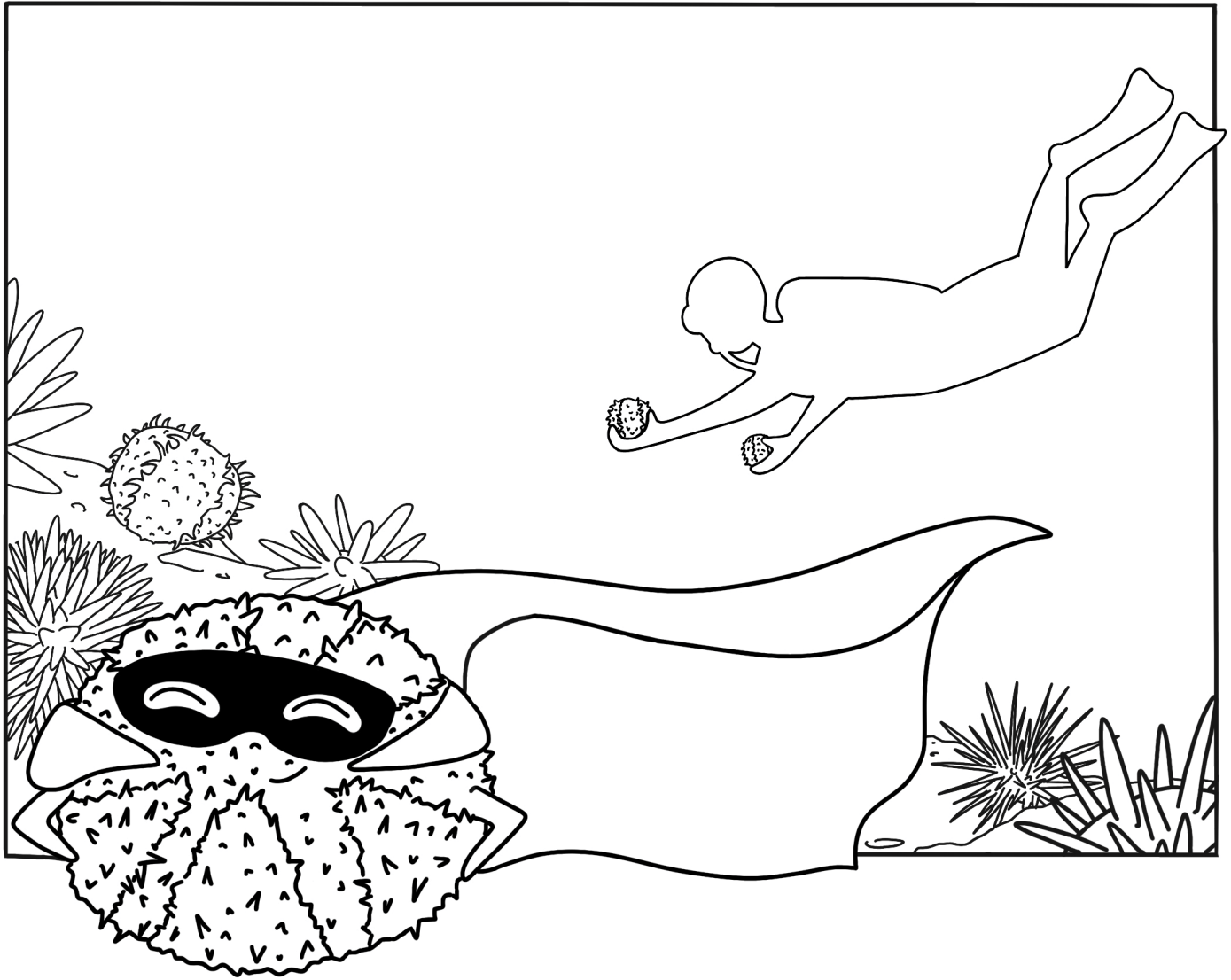
Nui nā ʻano iʻa hamulimu e noho
ana ma ka ʻāpapapa ma Hawaiʻi.
Kūkaukaʻi ka ʻāpapapa i nā iʻa
hamulimu a me ia ʻēkoʻa aku nō
nā iʻa hamulimu i ka ʻāpapapa.

He ʻehā ʻano iʻa hamulimu:

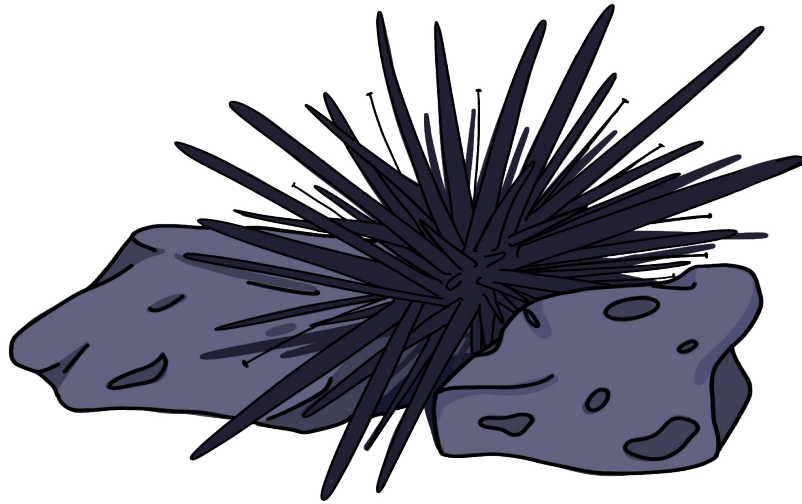
**hamulimu nalinali,
hamulimu waʻuwaʻu,
hamulimu waele a me
hamulimu ʻaipela.**



Ka Hāwa'e, ka Wana, a me ka 'Ina



Nā me'e o ka 'āpapa



He mau i‘a hamulimu hākui ka hāwa‘e, ka wana a me
ka ‘ina.

Lō‘ihi a pōkole paha ko lākou mau hākui a ‘o‘oi a
‘awa pū paha kekahi. No laila, e maka‘ala mau i ka
hehi ‘ole ma luna o lākou o ‘eha ka wāwae!

Hani ‘ia ka līoho me ko lākou waha i ‘ano like me
ka nuku. He 5 pā o ka waha o lākou e wa‘u ai i nā
pōhaku a lilo i wahi ma‘ema‘e e pa‘a ai ke ko‘a.

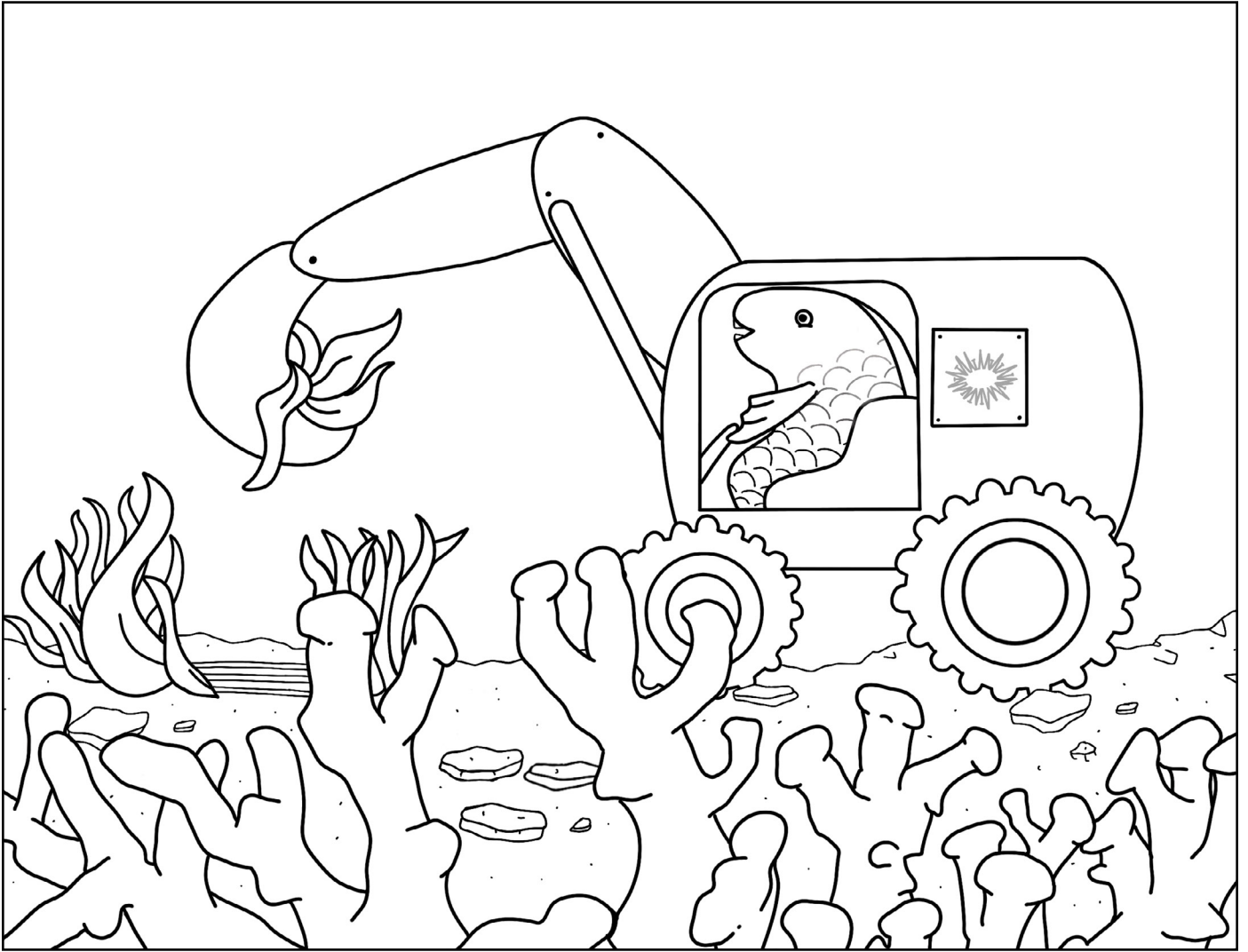
**Ua ‘ike
anei ‘oe?**

**Ho‘ohana nā kānaka akeakamai i ka
hāwa‘e e mālama i ka ‘āpapapa!**

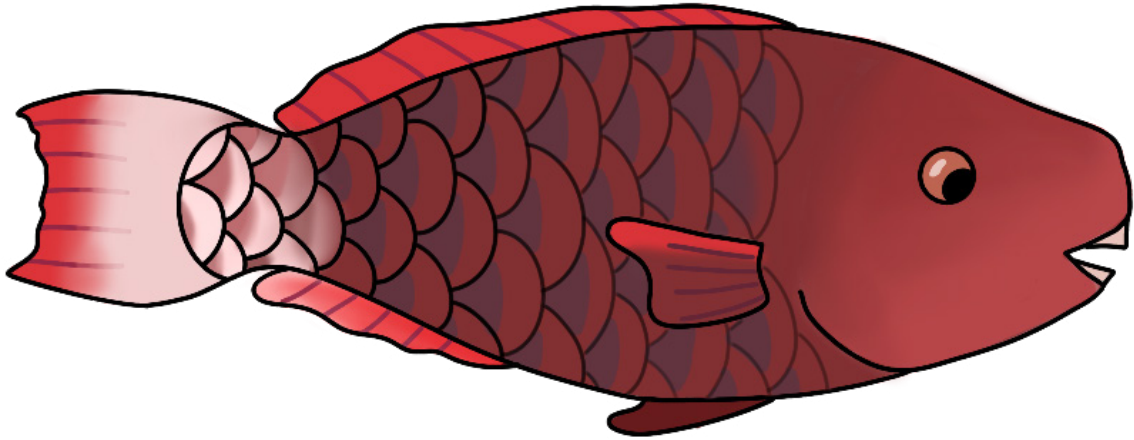
Ma O‘ahu, hānai ‘ia nā hāwa‘e pēpē ma kekahi
ke‘ena ho‘okolohua a laila ho‘onoho ‘ia ma luna o ka
‘āpapapa hemahema o kona ola a uhi ‘ia e ka līoho
uluāhewa. He kaianoho hou ko ka hāwa‘e a kōkua ‘ia
ka ‘āpapapa e ko lākou ‘ai ‘ana i ka līoho uluāhewa.

Uhu

Parrotfish



Nā i'a hamulimu wa'uwa'u
o ka 'āpapa



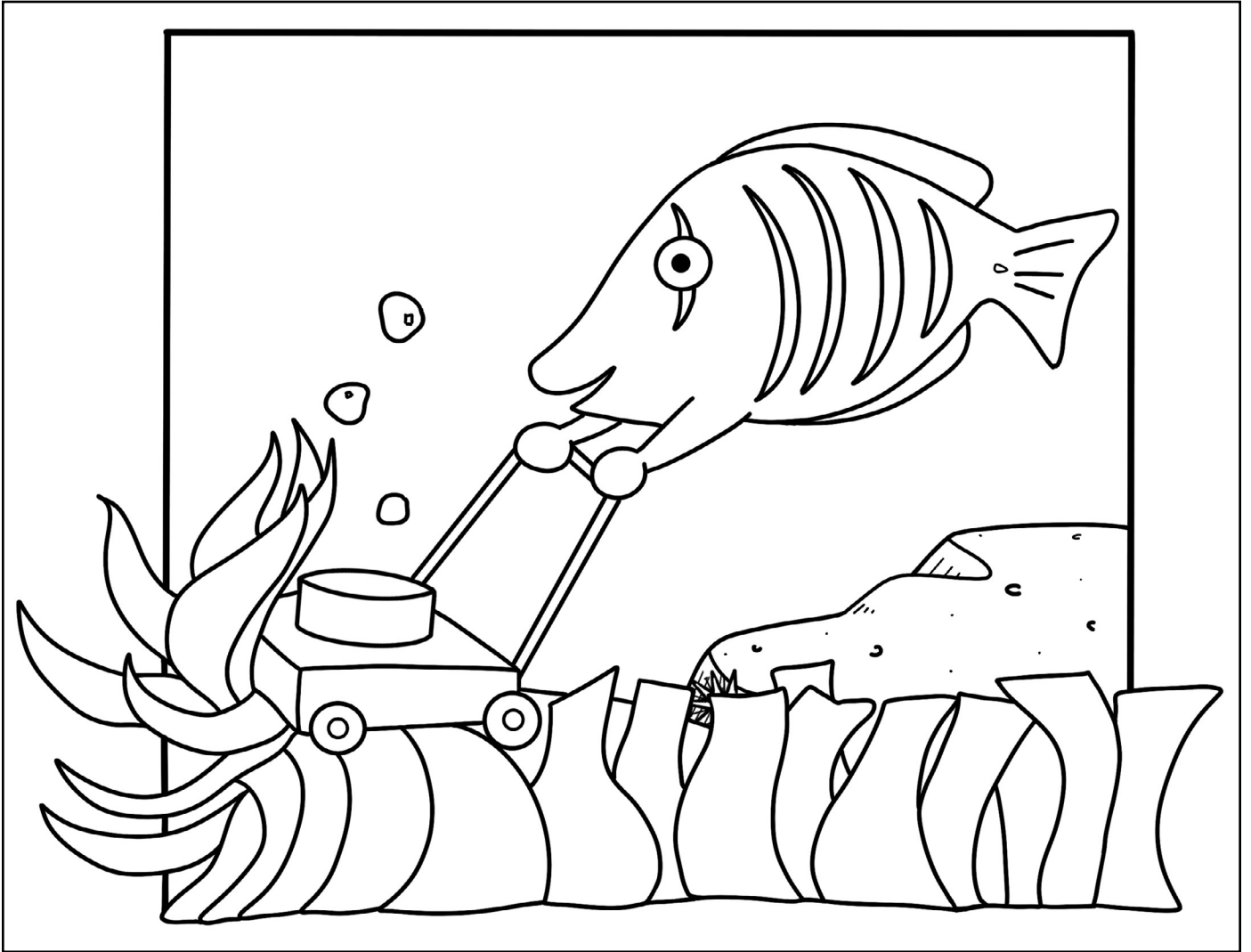
He uhu ka inoa laulā o nā *parrotfish*.

‘O nā uhu kino nui nā i‘a hamulimu wa‘uwa‘u o ka ‘āpapapa. Nahu lākou i nā pōhaku a me ke ko‘a a ‘ike ‘ia nā wahi hou o ka ‘āpapapa. He mea ko‘iko‘i ka hana a lākou ‘oiai he mau wahi hou kēia e ulu ai ke ko‘a ‘ōpio.

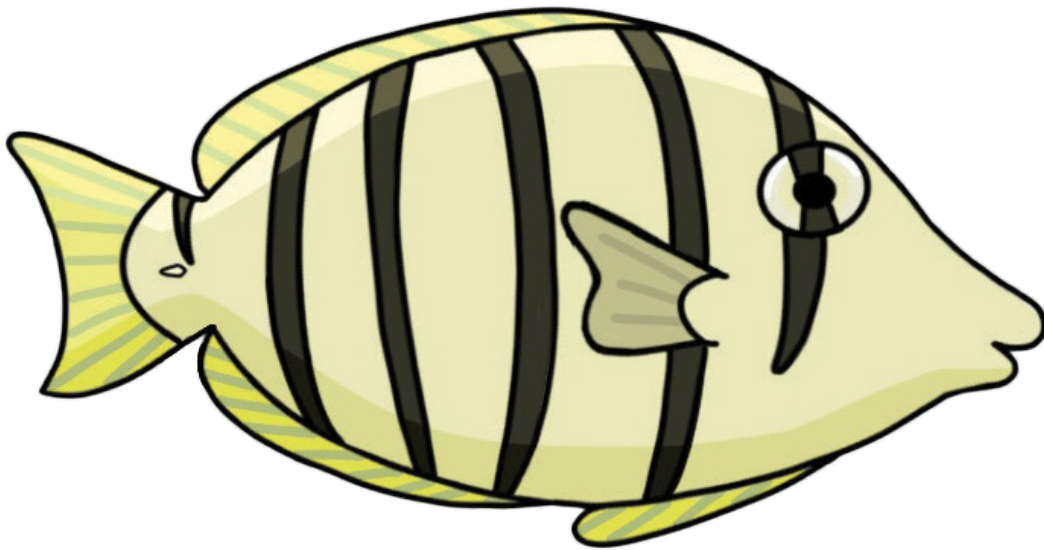
He ‘elua waiho‘olu‘u o ka uhu a he hō‘ailona ia o kona wā ma ka pō‘aiapuni ola. Ma ka wā ‘ōpio, li‘ili‘i a ‘ula‘ula/‘āhinahina lākou. He mau wahine ka hapanui o nā uhu ma ia wā. Ke o‘o a‘e ka uhu, loli ka waiho‘olu‘u o kekahi o lākou i ka uliuli a he mau kāne lākou ma ia wā.

Manini

Convict Tang



Nā hamulimu nalinali o ka
‘āpapa



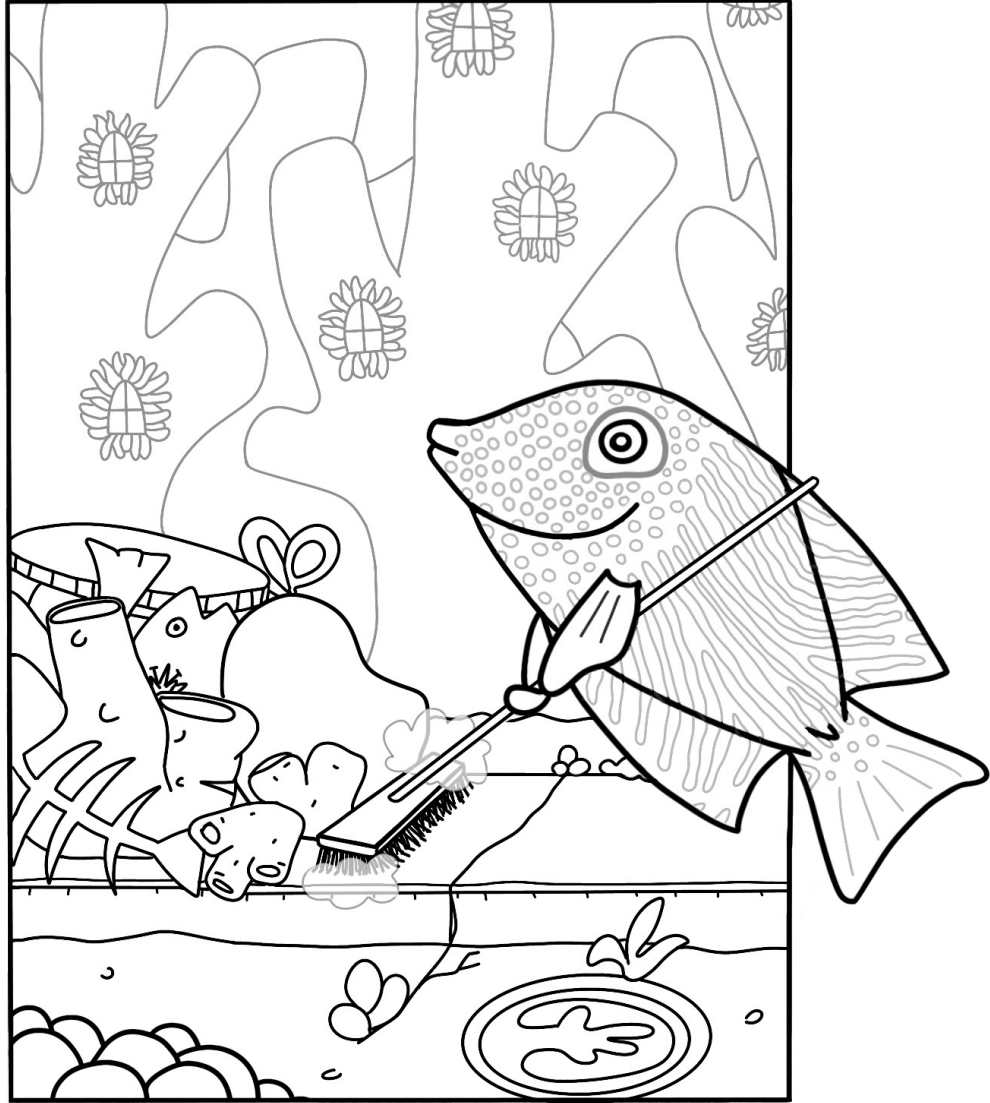
‘O ka i‘a he Convict Tang, kapa ‘ia he manini ma ka ‘ōlelo Hawai‘i. ‘O ka “li‘ili‘i” a i ‘ole ka “‘au‘a” ka mana‘o o “manini” ma ka ‘ōlelo Hawai‘i. Pili kēia mana‘o i kekahi mo‘olelo no ka lawa ‘ole o ka nui o ka manini i ‘aina na kekahi.

He i‘a hamulimu nalinali ka manini ‘oiai ‘ai lākou i ka limu ulu ne‘ine‘i, ‘ano like me ke ‘oki ‘ia o ka mau‘u. Kāohi ‘ia ka limu mai ka uluāhewa ‘ana ma kahi e ulu ai ke ko‘a hou.

Ola ka manini no ‘ehā a ‘oi makahiki a ulu lākou ma kahi o 12 ‘īniha ma ka lō‘ihi loa.

Kole

Goldring Surgeonfish



Nā i'a ho'oma'ema'e o ka
'āpapapa



‘O ke kole kekahi o nā i‘a ‘ike pinepine ‘ia ma nā
‘āpapapa o Hawai‘i.

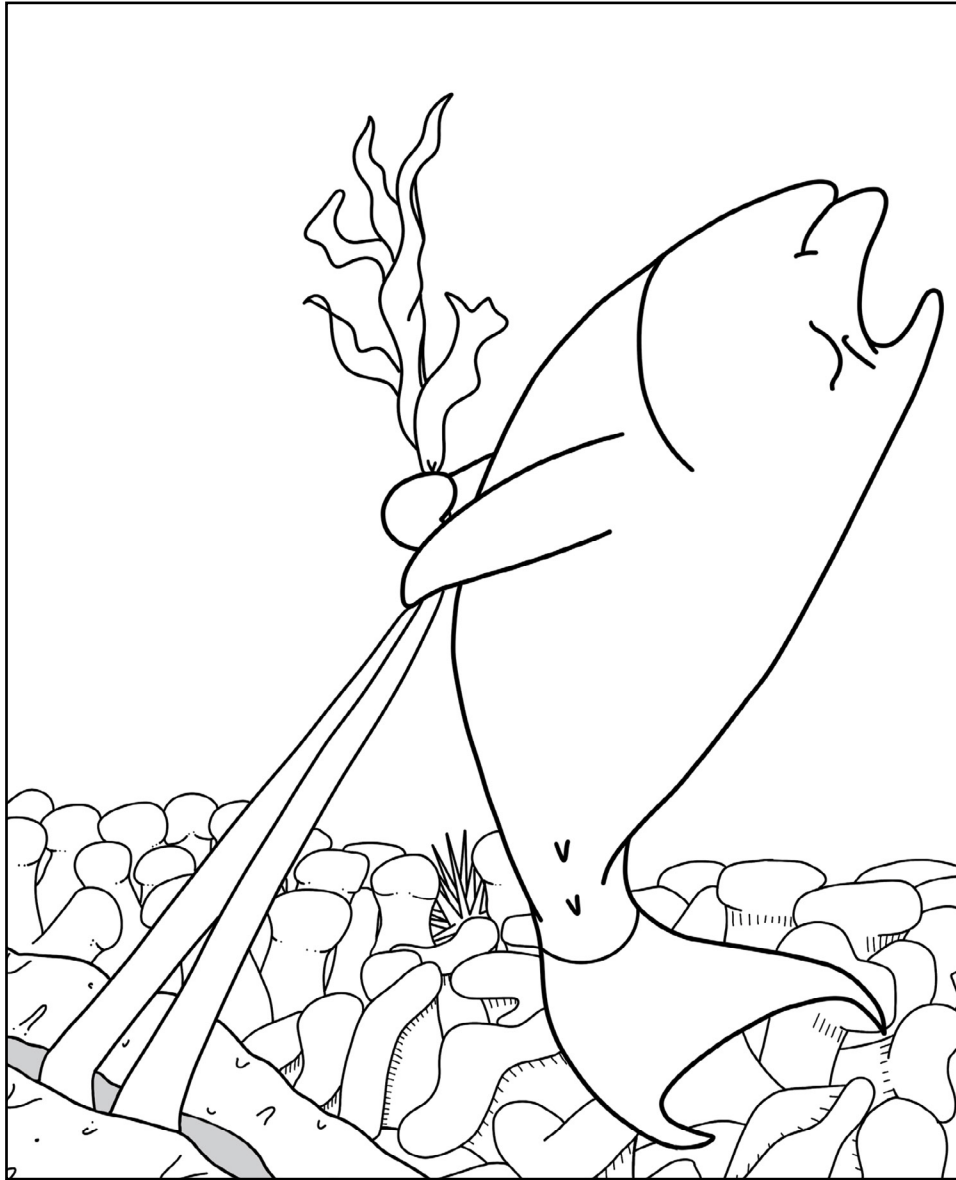
He i‘a ‘āpa‘akumu ke kole, ‘a‘ole noho ke kole ma
kekahi wahi ‘ē a‘e ma ka honua, ma Hawai‘i wale nō!

Wae aku ke kole i kāna ‘ai, ‘oia ho‘i ka limu, mai nā
mea hāpopopo ma ke one. He ko‘iko‘i kā lākou hana
i ‘ole paila wale nā mea ‘ino ma ka papakū.

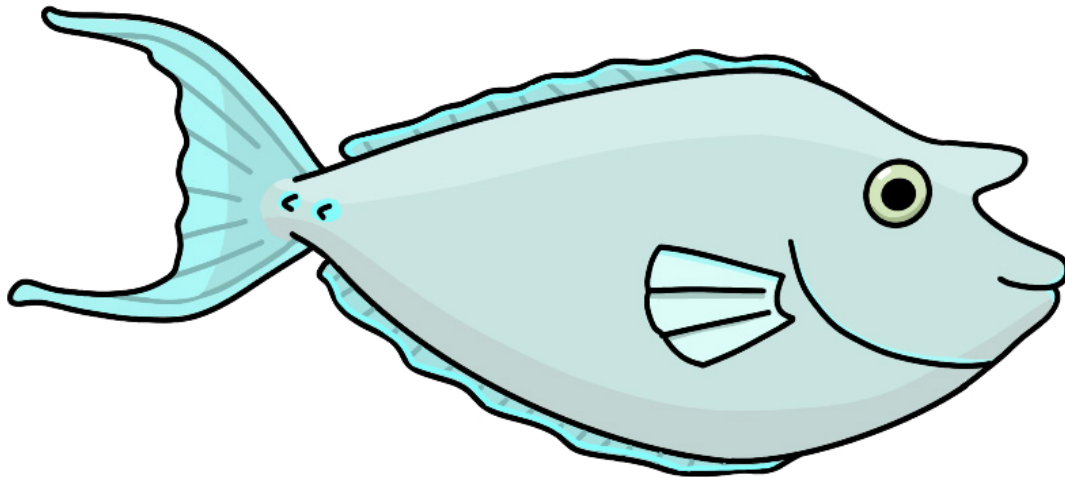
‘O ka ma‘amau, ola ke kole no 18 makahiki a i 7
‘īniha ka lō‘ihi loa o lākou.

Kala

Unicornfish



Nā i'a hamulimu waele o
ka 'āpapapa



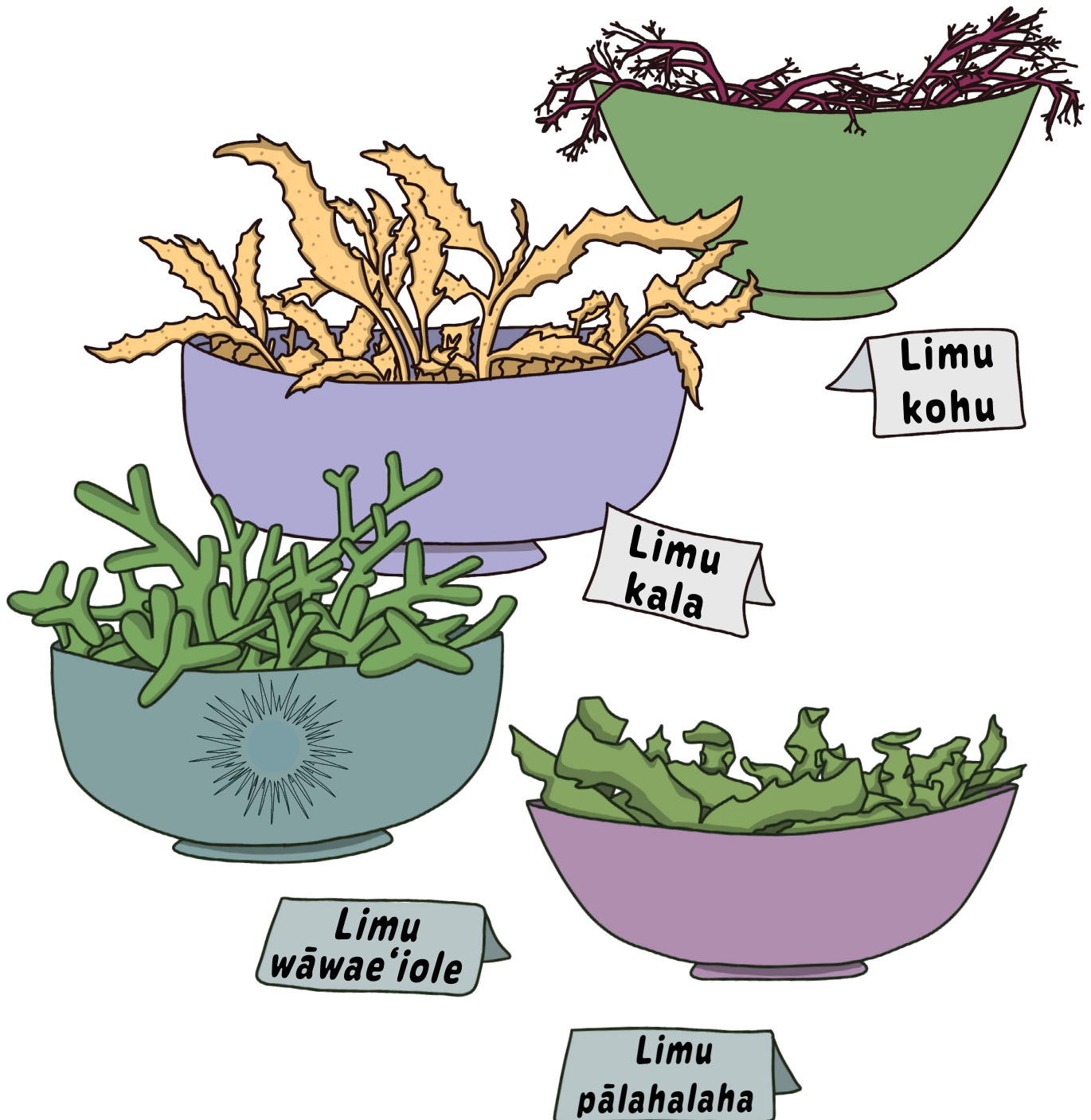
He unicornfish ka inoa pelekānia o ke kala.

‘Ike ‘ia ke kala ma nā naho i‘a ma ka hāpapa a me
nā makalae pōhaku.

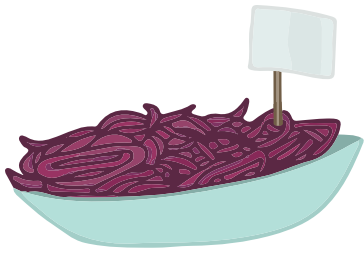
No nā kala o‘o na‘e, he mea mā‘amau ka holo
ho‘okahi ‘ana. He mau i‘a hamulimu waele lākou.
Waele a ‘ai lākou i ka limu lau ma ka ‘āpapapa. ‘O ka
limu kala kekahi mea‘ai māmā mā‘amau na ke kala.

Hiki i ke kala ke ola no 50 makahiki a ma kahi o 24
‘īniha ka lō‘ihi loa o lākou.

Nā Limu Punahele



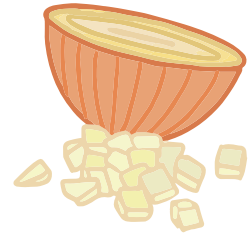
He lekapī limu nou!



1 Paona Limu Manauea
Ko'i'i



Wai, e Paila ana



1 'Aka'akai, i 'Oki'oki 'ia



1 'Āpana 'Aka'akai Pīlau, i
'Oki'oki Li'ilil'i 'ia



2 Puna Pākaukau
Wīneka Laiki
3/4 Kī'aha Koiū
1 Puna Kī 'Aila Sesamī



1 Puna Kī Kōpa'a
1/4 Puna Kī Pepa 'Ele'ele
Kai Nīoi, e Like me Kou
'Ono

Ka Hana 1: E waiho i ka limu ma kekahi kānana ma loko o ke kinika a laila e ninini i ka wai e paila ana i mea e kupa iki 'ia ai ka limu.

Ka Hana 2: E kaka i ka limu me ka wai hu'ihu'i ma mua o ke kupa piha 'ia.

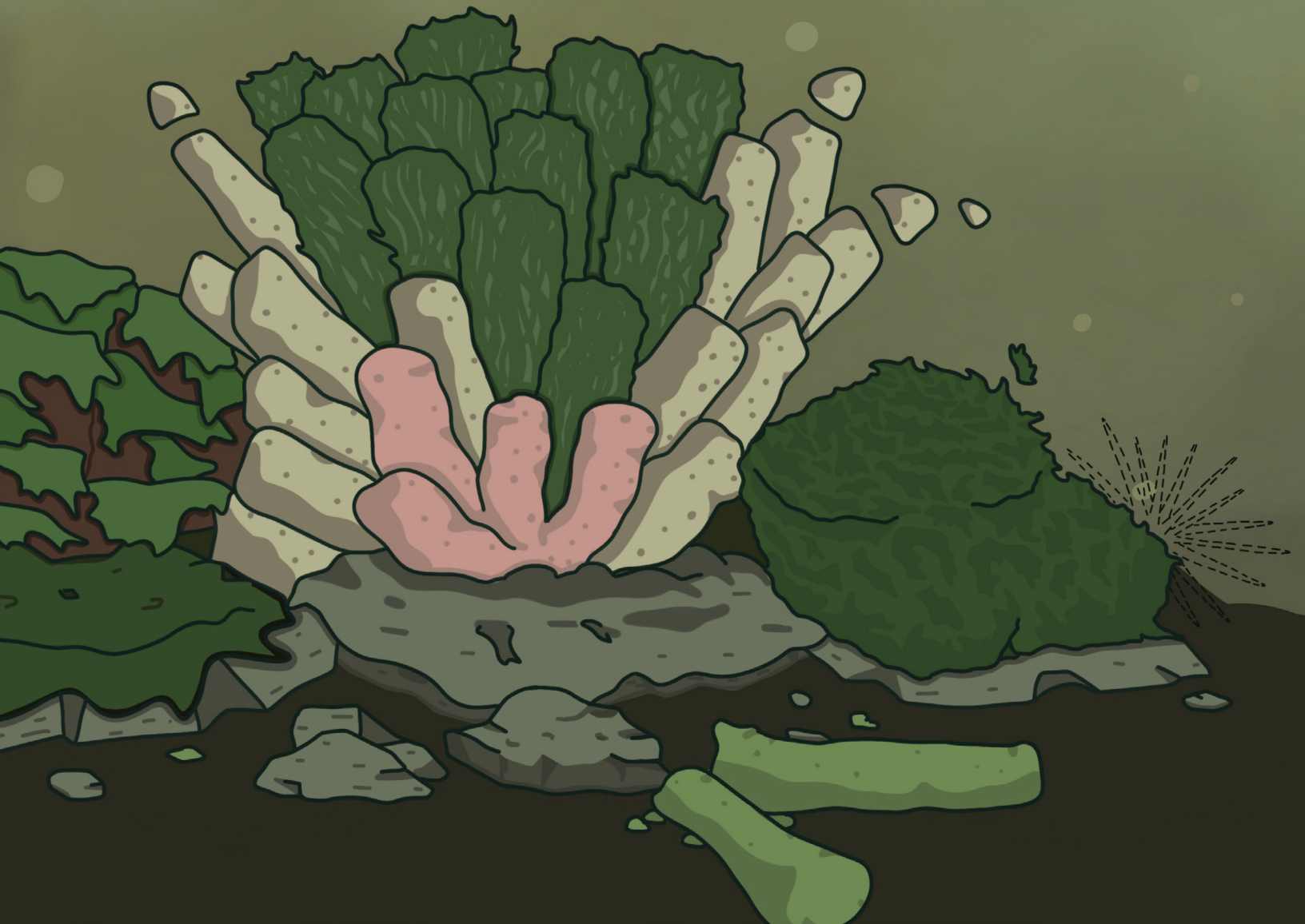
Ka Hana 3: E 'oki'oki i ka limu ma nā 'āpana he 2" ka lō'ihī.

Ka Hana 4: E ho'omiko i ka limu me nā mea 'ē a'e.

Ka Hana 5: E waiho ma ka pahuhau a ao ka pō a e ho'ohui me ka poke.



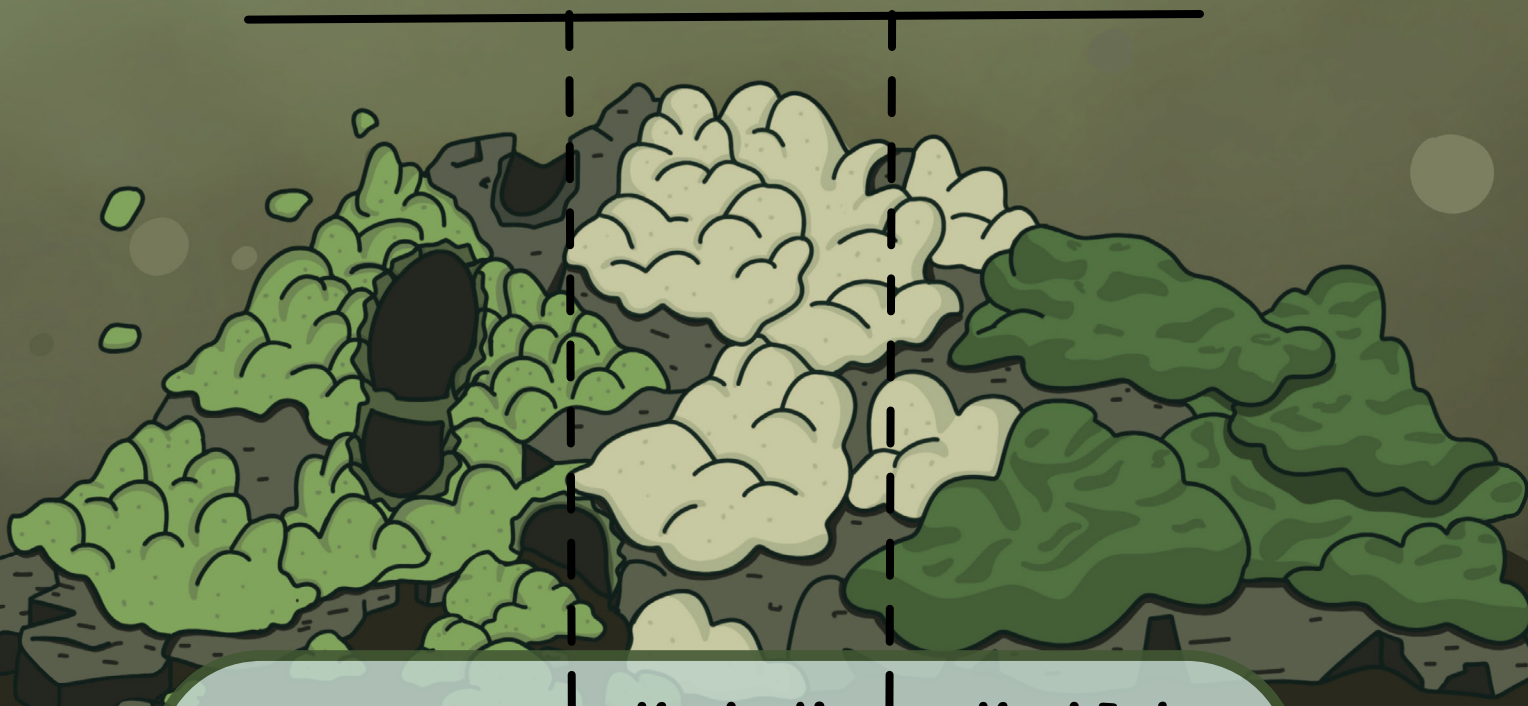
**‘A’ole ola pono
ka ‘āpapapa ke nele i nā i‘a
hamulimu ‘ole**



Nā kumu e ola pono 'ole ai ka 'āpapapa:

- Ke kai lepo
- Ka 'ōpala
- Ka ho'omehana kai
- Ka lawai'a pākeu

Nā mea e ho'opilikia nei i ka 'āpapapa:



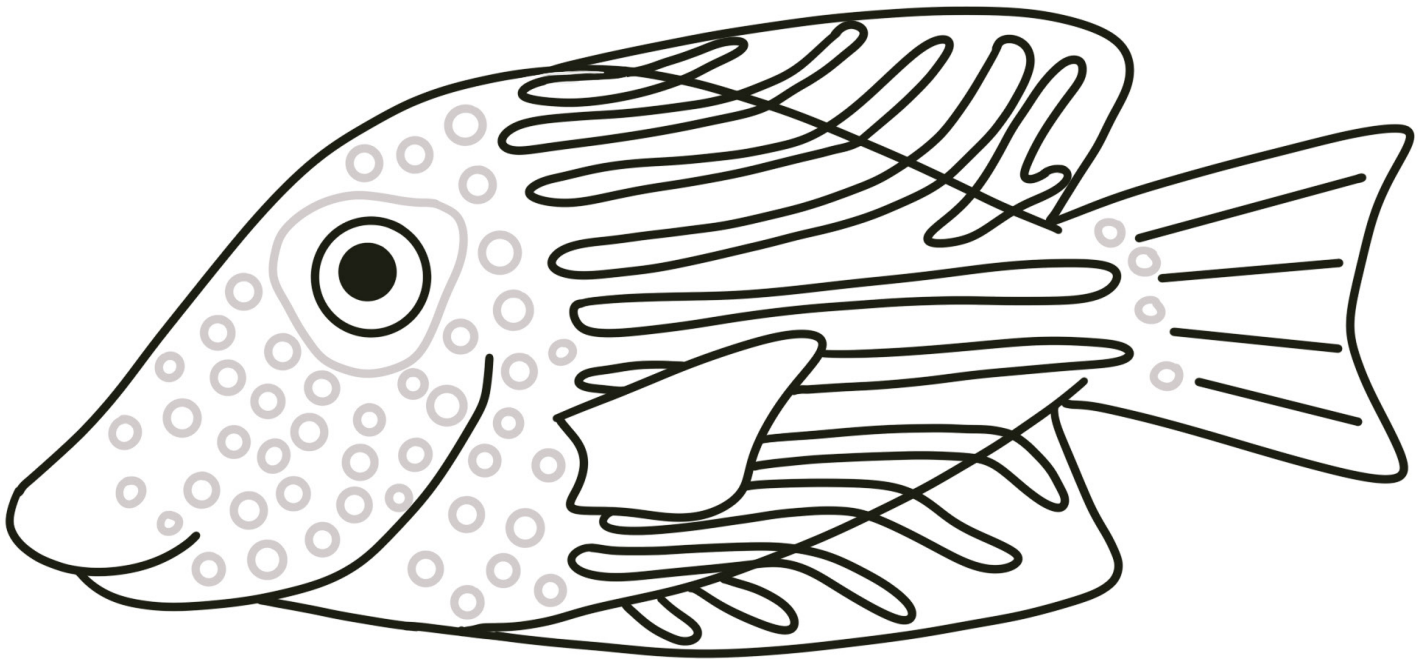
Nā Kānaka

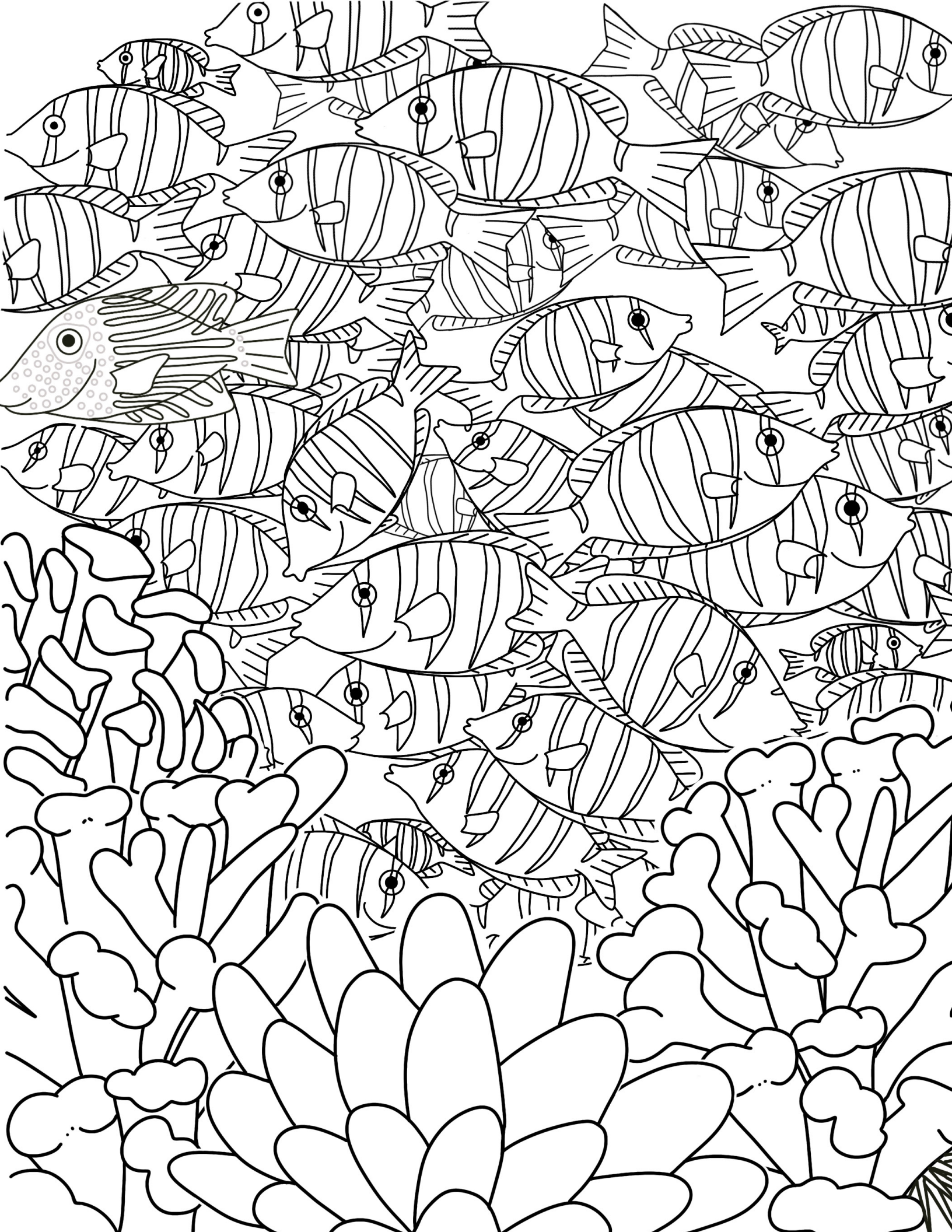
**Ke Loli
Aniau**

**Ka Līoho
Uluāhewa**

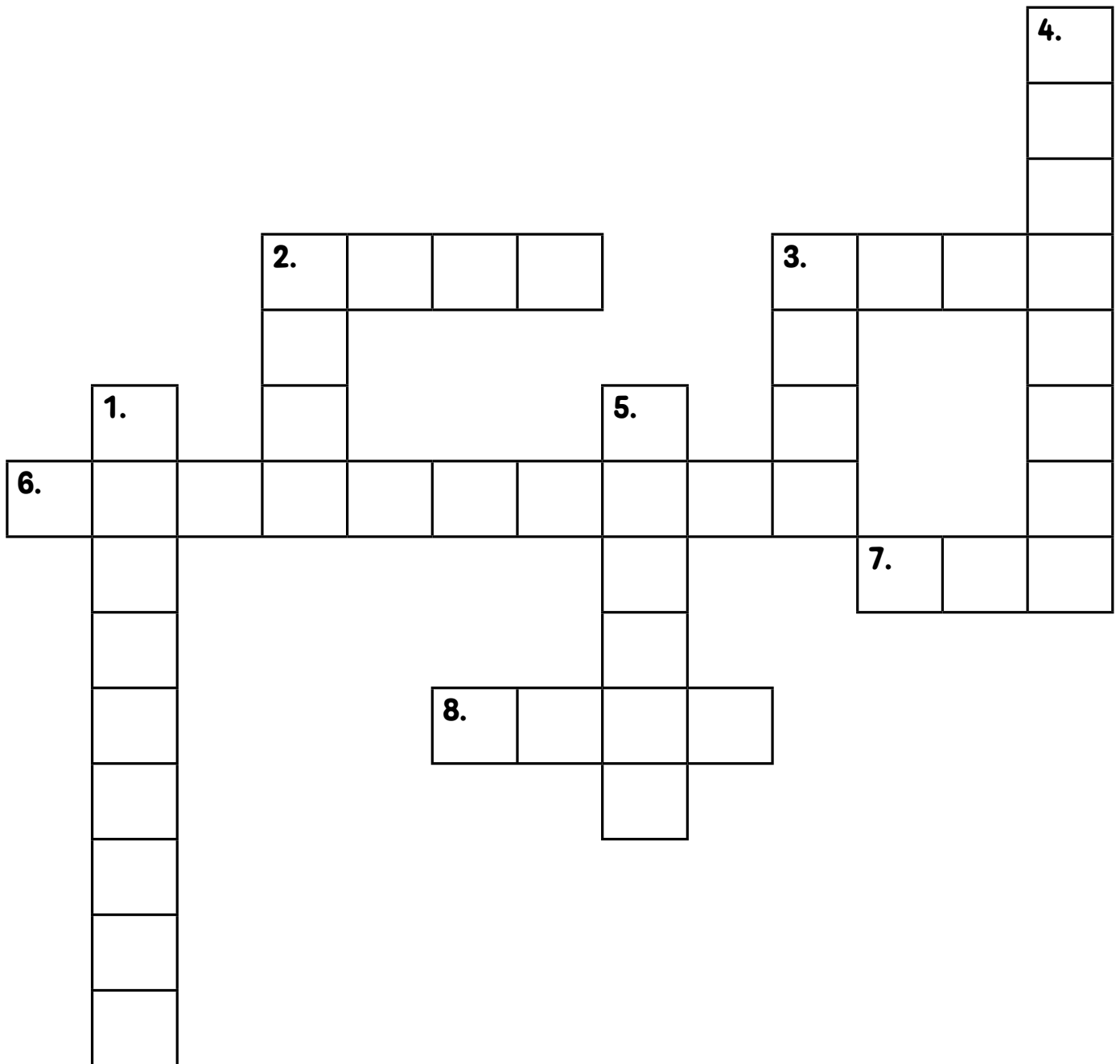
E 'imi i ke kole

Goldring Surgeonfish





Nane Hua'ōlelo



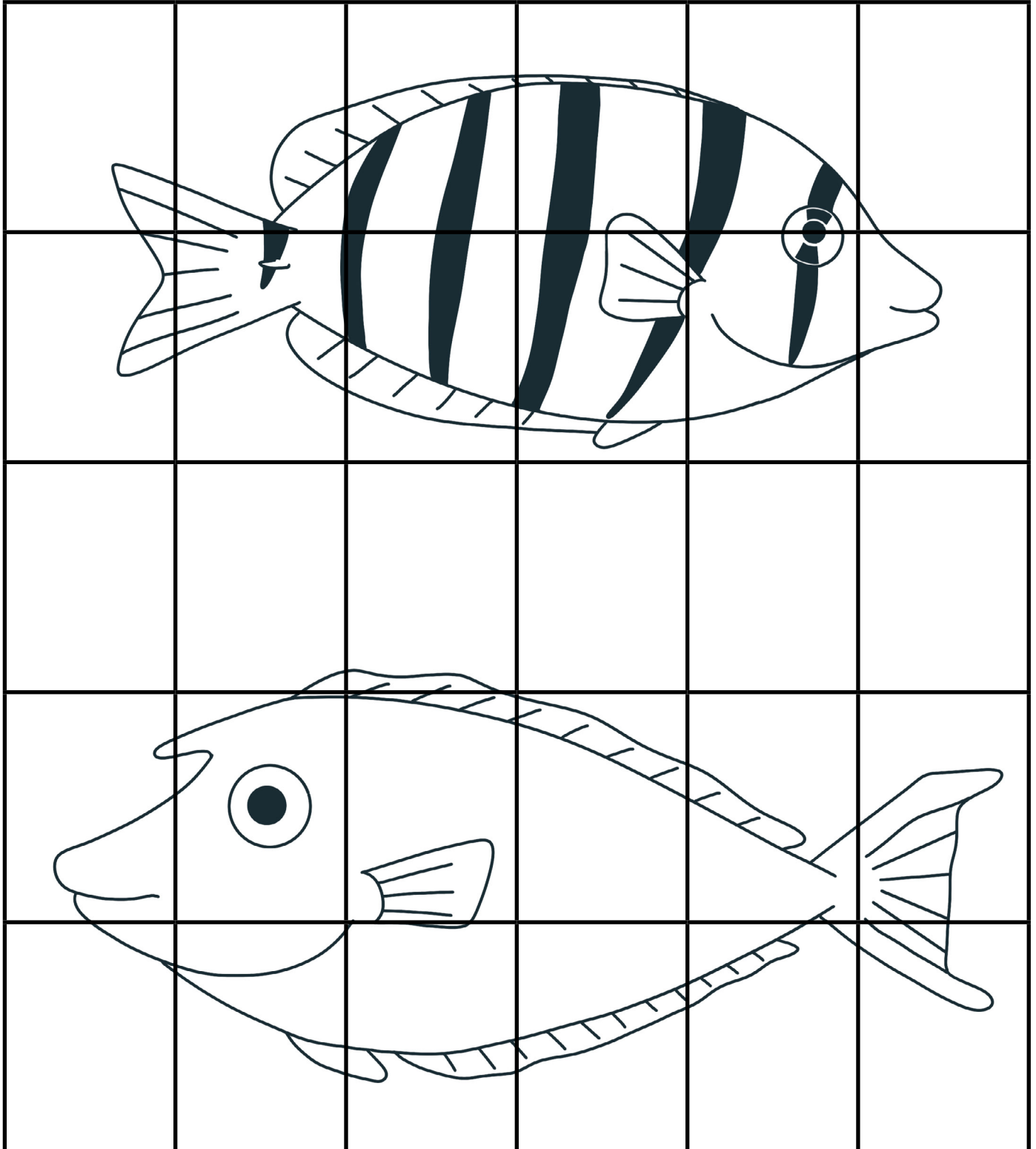
PAPAKŪ

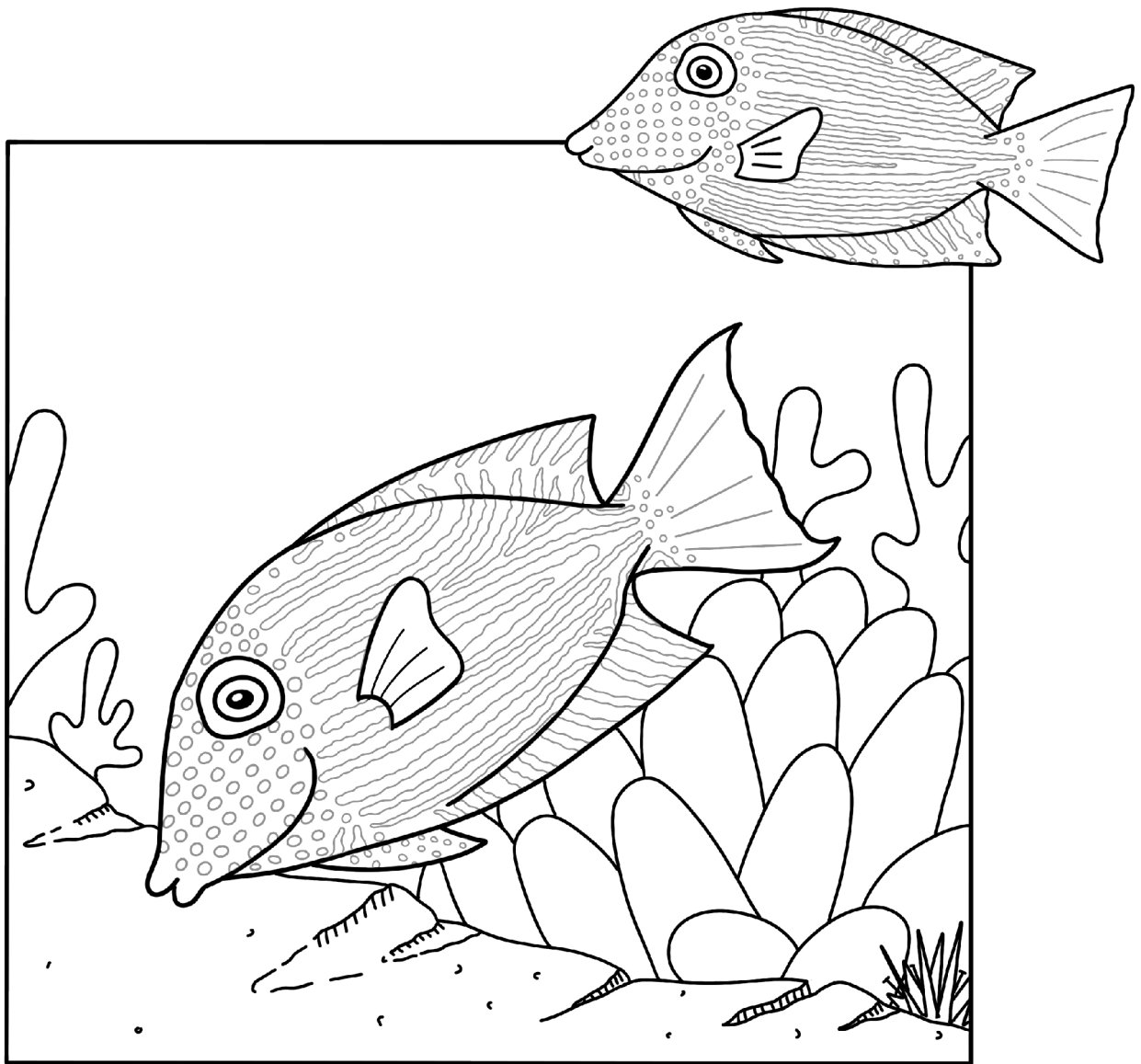
1. he limu i like kona nānā 'ana me kekahi mahele kino o ka 'iole
2. he i'a lae kiwi
3. ka i'a e ho'omaka ai ma ka piohē
4. he i'a 'ai limu wale nō
5. he i'a kahakaha

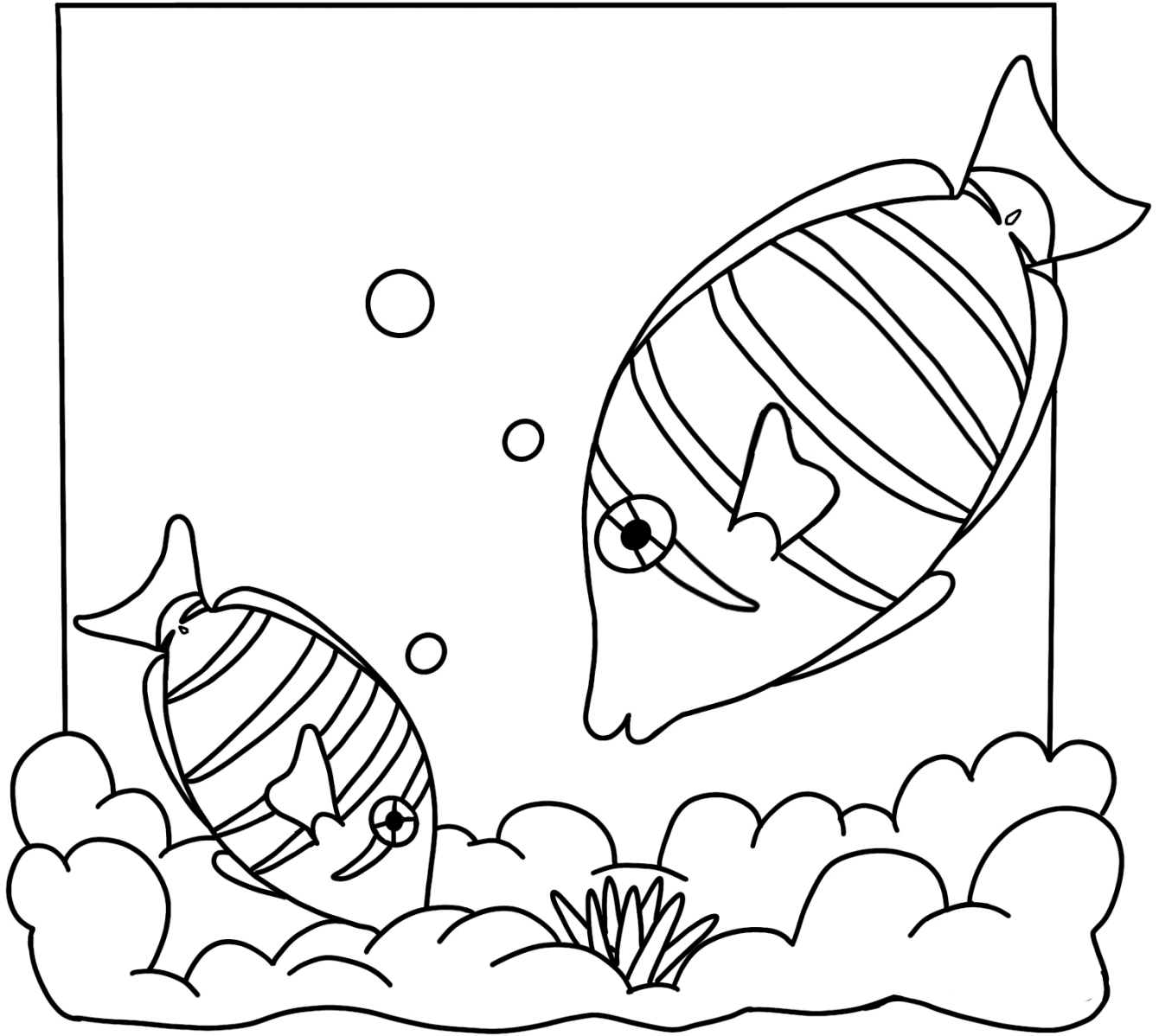
PAPAMOE

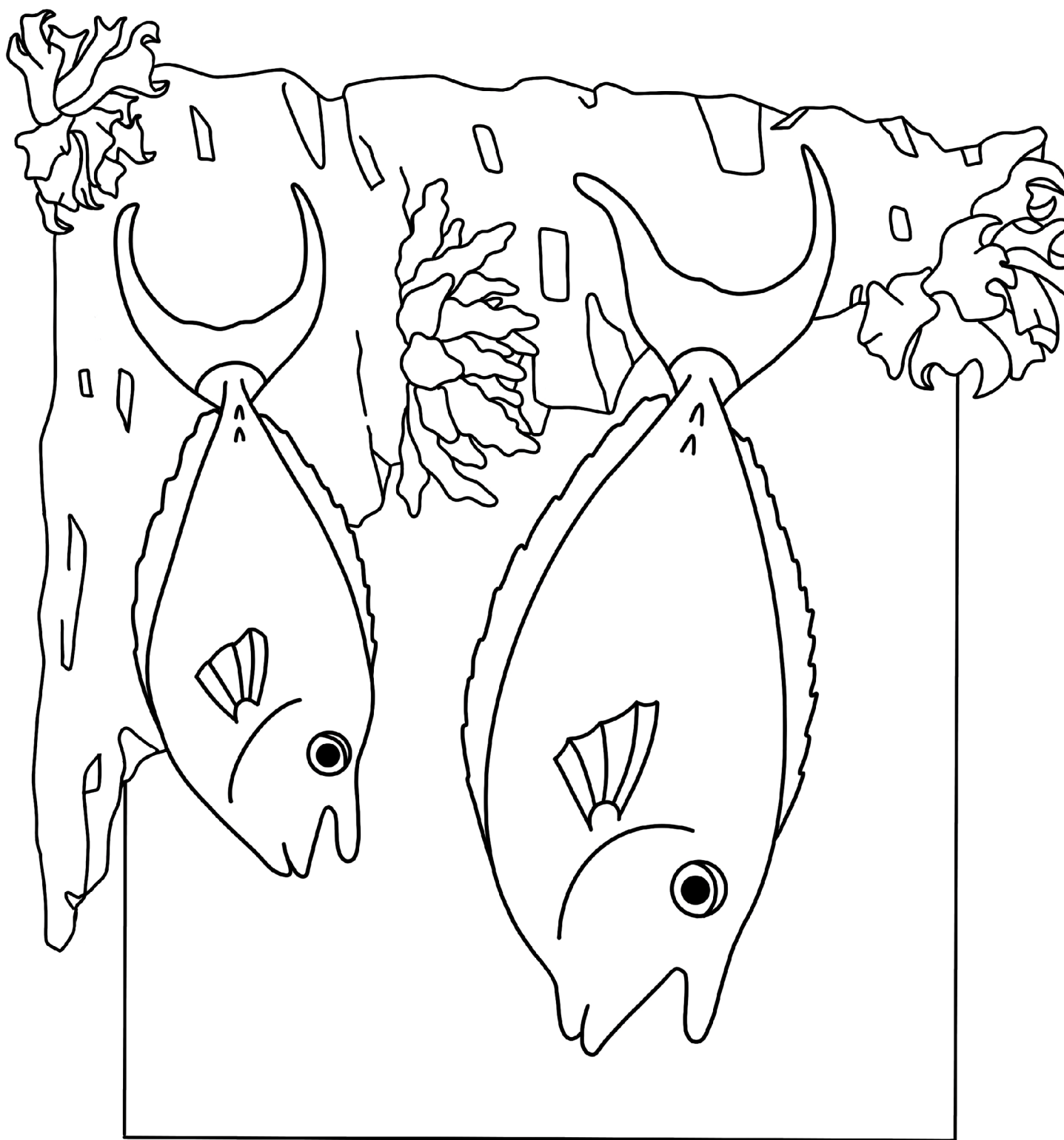
2. ka i'a "maka onaona"
3. he 'ano limu 'ākala a 'ula'ula paha kona waiho'olau'u
6. he 'ano limu i 'ano like kona nānā 'ana me ka lekuke
7. ka i'a wa'uwa'u o ka 'āpapapa
8. he i'a me nā hākui he nui ma kona kino

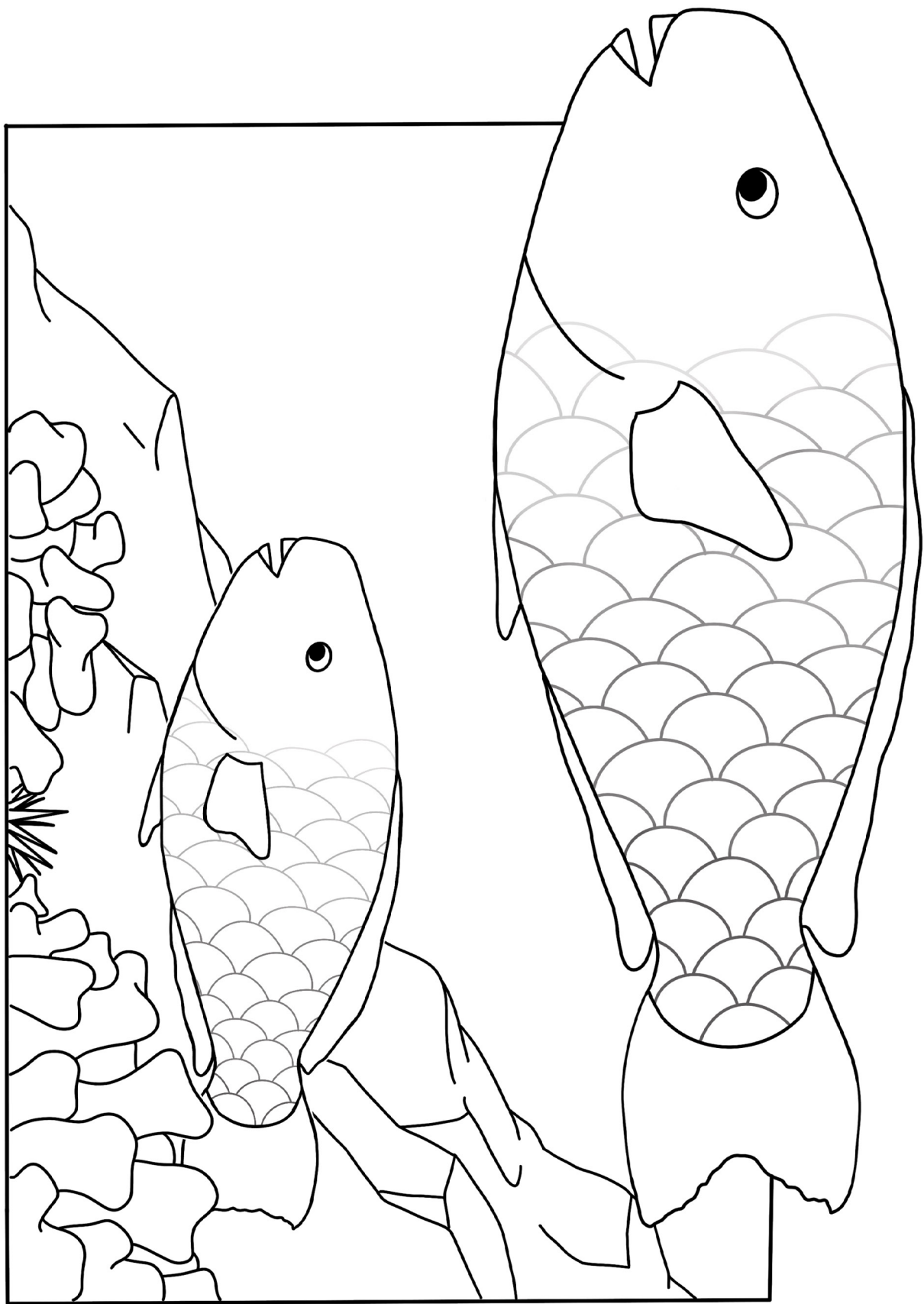
E kaha ki'i i ka manini a me ke kala. E ho'ohana i nā
laina o ka maka'aha ma ka 'ao'ao hema e kōkua ai iā
'oe e kaha ki'i i kēia mau i'a ma ka 'ao'ao 'ākau.

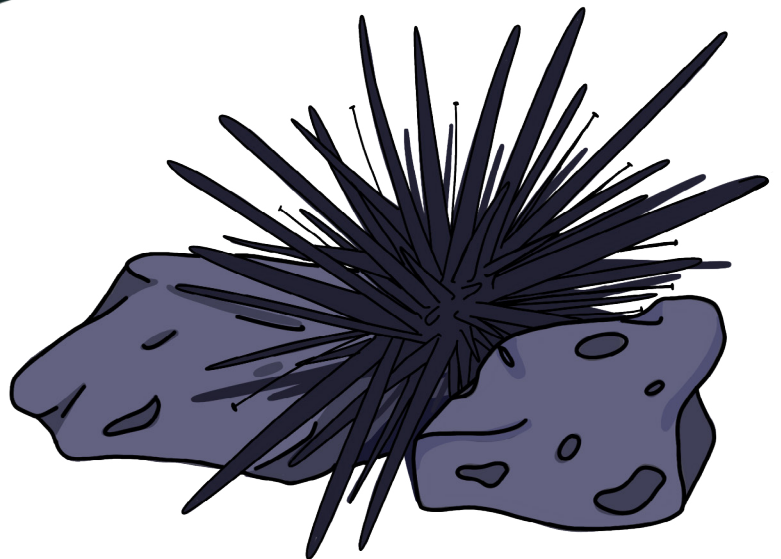
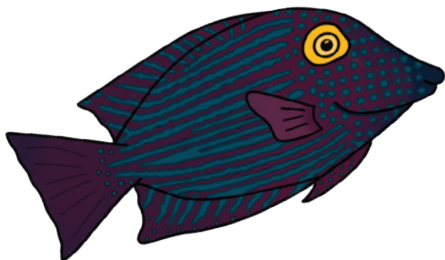
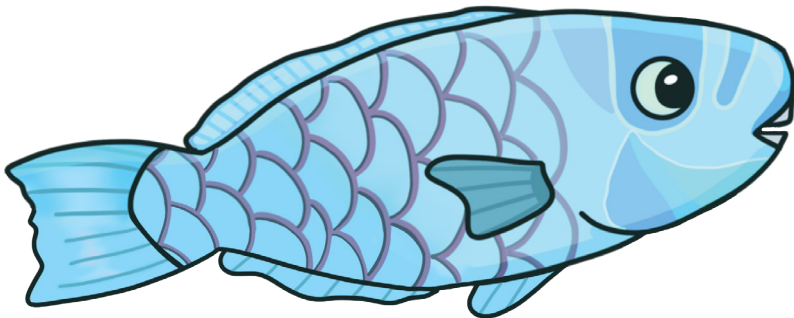
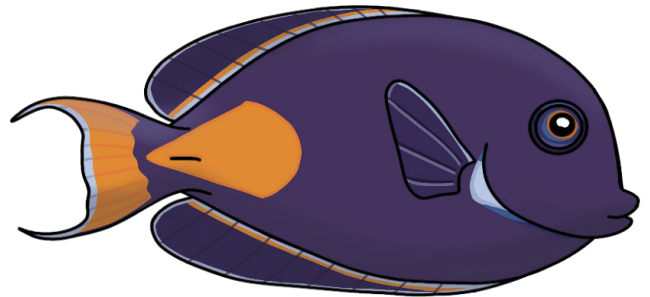
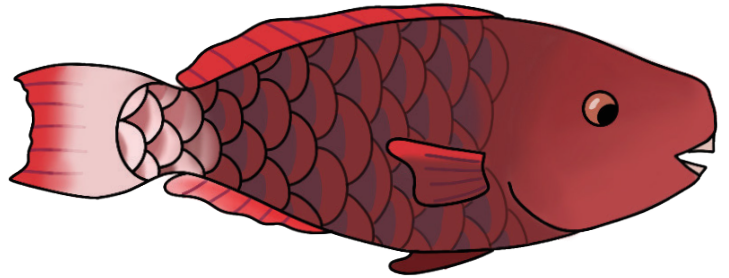
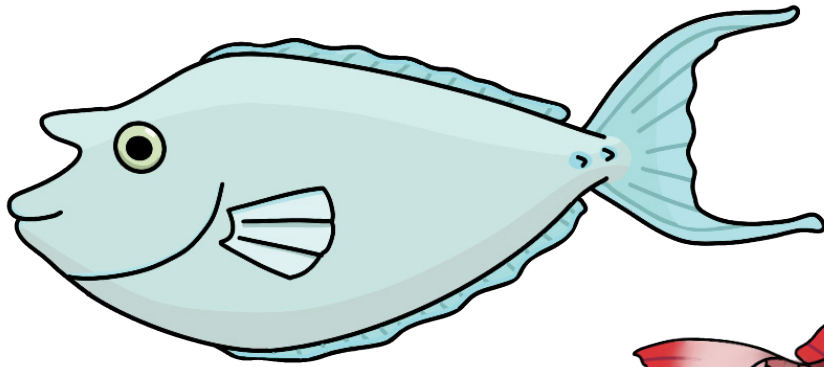












Ho'ola'a 'ia kēia puke kala na nā keiki, 'o lākou ho'i
ka hanauna hou o nā lawai'a a me nā kīa'i o ke kai
makalae.

Nā I'a Hamulimu: Nā Mahi 'ai o ka 'Āpapapa

Puke Ha'awina a Puke Kala



Holomua
Marine Initiative

Hawai'i
CORAL REEF
Initiative

