

Nā Pō'ino O Ke Ao Kīkī'i

'Ōwehe Laulā:

I kēia ha'awina, e a'o ana nā haumāna i ke kumu no nā kau 'eha a 'o ia ho'i ke kīkī'i o ke ao ma ka iho (axis). Ma muli o kēia kīkī'i, 'oko'a loa ka mālamalama o ka lā i ka makahiki ma kahi Polar Regions ke ho'ohālikelike 'ia i ka mālamalama o ka pō'ai waena honua (equator), kūpa'a ka mālamalama o ia wahi. He mea nui ka mālamalama o ka lā i nā wahi like 'ole. Ho'ololi ka mālamalama o ka lā i nā lauana anilā. Hiki i nā lauana anilā ke ho'ololi i nā pō'ino lua pele.

Nā Pahuhopu:

E a'o ana ka haumana:

- e hō'ike i ka mālamalama o ka lā ke pā mai o nā wahi like 'ole o ka Honua i ke kau ho'oilo a me ke kauwela;
- e wehewehe i nā 'oko'a o nā lauana anilā ma muli o ka heluna o ka mālamalama o ka lā i nā wahi like 'ole;
- e ho'ohālikelike i ke anilā i Alaska me ke anilā i Hawai'i e ka nānā 'ana i nā pakuhi; a me
- e wehewehe i ka loli 'ana o nā pō'ino lua pele ma muli o o ke anilā a me nā kau.

Nā Pono Ha'awina:

- Nā poepoe Styrofoam, 5 'iniha ke anawaena
- Nā penikala
- Nā pānānā
- Ke kukui kū pākaukau (ke aniani 'ōpu'u kukui)
- Ka Pepa Ha'awina Haumana: "Ke Ao Kīkī'i"
- Ka Pepa Ha'awina Haumana: "Nā Pō'ino O Ke Ao Kīkī'i"
- Ke pā DVD *Ola Ka Honua: Volcanoes Alive*

Nā Pane I Ka Pepa Ha'awina Haumana:

Ke Ao Kīkī'i:

1. No, the amount is about the same
2. The temperature should not differ much throughout the year
3. None. Students might answer "a little bit" depending on how they hold the globe.
4. Winter should be cold in the north.
5. Winter

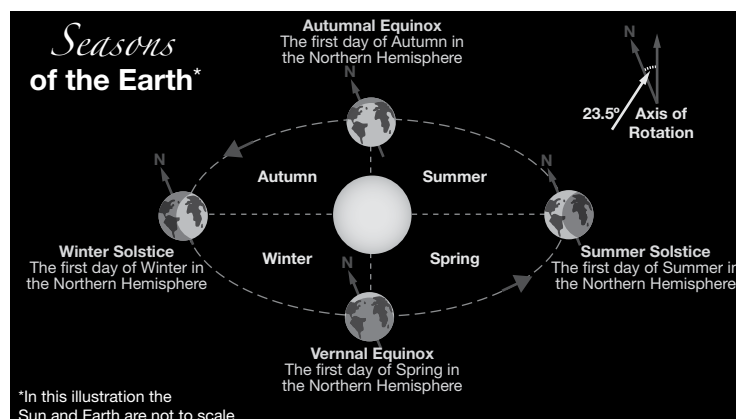
Nā Pō'ino O Ke Ao Kīkī'i

1. Kahului
2. Iulai a me 'Aukake
3. Kēkēmapa a me Ianuali
4. Ianuali
5. Ianuali
6. Ianuali, Pēpēluali, Mālaki, Nowemapa, Kēkēmapa (mali'a paha 'Apelila a i 'ole 'Okakopa)
7. E 'oko'a ana nā pane akā pono nā mahina Ianuali a me Kēkēmapa i ka pane
8. Ke kahe lehu 'ena'ena, Hā'ule ka lehu, Ke kahe 'ūkele kūpikipiki'ō
9. Ke kahe lehu 'ena'ena, Hā'ule ka lehu
10. Ka lua'i pele pahū , Ke kahe 'ā pele lohi
11. Ke kinoea, Ke kahe 'ā pele lohi
12. Kēkēmapa

Nā Pō'ino O Ke Ao Kīkī'i

Ke Ka'ina Hana Ha'awina:

1. E noi i nā haumāna inā maopopo lākou i nā kau 'oko'a. E pane ana nā haumāna aia ka Honua kokoke i ka lā i ke kauwela a mamao aku i ke kau ho'oilō; akā na'e, 'a'ole kēia ke kumu no nā kau. E wehewehe 'o ke kumu ho'i o nā kau ke kīkī'i o ke ao ma kona iho (axis).
2. E noi i nā haumāna e ho'okumu i ke kūkohu ao e hō'ike i nā kau i ko ka Honua kīkī'i. E ho'ohana i ke kukui a me kekahi poepoe Styrofoam e hō'ike i ka nui o ka mālamalama o ka lā e pā i nā wahi like 'ole o ka Honua i ka wā o nā kau 'ehā.
3. E kau ka penikala i loko o ka poepoe Styrofoam, a hō'ike i nā haumāna e kahaki'i ka Pō'ai Anu 'Ākau (Arctic Circle), ka Pō'ai Waena Honua (Equator), a me ka Pō'ai Anu Hema (Antarctic Circle) ma ka "Honua". E hō'ike pehea e kīkī'i ka "Honua" i nā kēkelē 23.5 i kahi o papa kuhikuhina papakū (vertical plane).
4. E hō'ike i ke ka'a o ka "Honua" kahi hapa o ke kukui, kū ma ke kēkelē 180 mai kahi ho'omaka. Pono nā haumāna e ho'opa'a i ka poepoe i ka huina like ke ne'e ka poepoe apuni o ke kukui (e nānā i ke ki'ikuhi) a me ka mamao like o ke kukui.
5. No ka pane pololei, pono nā haumāna e ho'opa'a i ka poepoe i 5 'iniha mai ke kukui. E hō'ike i ka 'oko'a ke kau ka poepoe i nā mamao 'oko'a mai ke kukui.
6. E kāka'ahi i ka Pepa Ha'awina Haumana: "Ke Ao Kīkī'i."
7. Ke pau ka ha'awina i nā haumāna, e kūkākūkā i nā nīnau a me nā pane. Inā pono, e ho'oma'ama'a 'o ka lā ke kumu o ka wela o ka Honua, no laila inā 'a'ole nui ka mālamalama o ka lā i ka Poepoe Hapa 'Ākau (Northern Hemisphere) i ke kau ho'oilō emi nā ana wela. Ua kuapo nā kau i nā wēlau.
8. 'Ano kūpa'a ka nui o ka mālamalama i ka lā ma kahi Pō'ai Waena Honua (Equator) i ka maka-hiki; no laila, 'a'ole 'oko'a loa ke ana wela mai kēlā me kēia kau.
9. E kāka'ahi i ka Pepa Ha'awina Haumana: "Nā Pō'ino O Ke Ao Kīkī'i."



Ke Ao Kīki'i

Ka 'Ike Hou A'e:

'O ka lā ke kumu o ka wela no ka Honua. Ma muli o ke kīki'i o ka Honua, pā ka lā i nā wahi like 'ole o ka Honua i kēlā me kēia manawa o ka makahiki. 'O kēia ke kumu maoli o nā kau.

Nā Pono Ha'awina:

- Ka poepoe Styrofoam
- Ka penikala
- Ka 'ūpā kāpō'ai
- Ke aniani 'ōpu'u kukui

Ke Ka'ina Hana Ha'awina:

1. E kau ka poepoe Styrofoam i ka lima. E kau ka penikala i waenakonu o ka poepoe, mai lalo a i luna. Pono e komo ka penikala i ka waenakonu o ka poepoe. 'O ka poepoe ka Honua, 'o ka penikala ko ka Honua iho (Earth's axis).
2. E kahalina i ka waena o ka poepoe ma ka 'ao'ao kūpono o ka "iho" (axis). 'O kēia laina ka Pō'ai Waena Honua (Equator). Huki i ka penikala mai ka poepoe. E ho'ohana i ka 'ūpā kāpō'ai e kahaki'i i ka pō'ai ma luna o ka poepoe ma kahi o 1 'īniha ke anawaena. E ho'ohana i ka puka mai ka penikala ma ke 'ano he waenakonu o ka pō'ai. 'O kēia pō'ai ka Pō'ai Anu 'Ākau (Arctic Circle)
3. E kahaki'i i ka pō'ai 'elua ma lalo o ka poepoe ma ke 'ano ki'ina hana like. 'O kēia pō'ai ka Pō'ai Anu Hema (Antarctic Circle).
4. E komo hou ka penikala i ka puka o ka poepoe. Ho'ohana ka Figure 1 ma ka pepa ha'awina no ke kōkua, e kīki'i i ka "Honua" i ke kēkelē 23.5 i kahi o papa kuhikuhina papakū (vertical plane). E ho'opa'a i ka poepoe ma kēia huina no ke koena o kēia ha'awina.
5. I kēia manawa, e kau ka poepoe i kahi pilipā i ka 'ōpu'u kukui, e ho'opa'a i ka poepoe i 5 'īniha mai ka 'ōpu'u kukui. Pono e ho'opa'a i ke kīki'i o ka poepoe! Pono ka luna o ka penikala e kuhikuhi ma 'ao'ao a'e o ke kukui a o ka lalo ho'i o ka penikala e kuhikuhi ana ma kahi o ke kukui. 'O kēia ke kau ho'oilo i ka Papa Hapa 'Ākau (Northern hemisphere).
6. Aia ka Pō'ai Anu 'Ākau (Arctic Circle) i ke ao a i 'ole ka pō? Pehea ka Pō'ai Anu Hema (Antarctic Circle)? No ka Pō'ai Waena Honua (Equator) aia ia i ke ao a i 'ole ka pō, e koho (estimate). E palapala i nā loina i ka mahele "'Ikepili" ma ka pepa ha'awina.
7. Pono e ho'opa'a i ka poepoe i ka huina like, e ne'e i ka poepoe i ke kēkelē 180 apuni o ke kukui mai kahi ho'omaka. Aia ka luna o ka penikala e kuhikuhi ana ma ka 'ao'ao o ke kukui. 'O kēia kūlana ke kauwela i ka Papa Hapa 'Ākau (Northern hemisphere). E palapala i nā ao ma ka Pō'ai Waena Honua (Equator), Pō'ai Anu 'Ākau (Arctic Circle), Pō'ai Anu Hema (Antarctic Circle) i kēia manawa.
8. E ho'ohana i ka 'ikepili a me ka pakuhi, e pane i nā nīnau ma ka 'ao'ao a'e.

Ke Ao Kīkī‘i

Ka ‘Ikepili:

	Ka Ho‘oilolo I Ka ‘Ākau	Ke Kauwela I Ka ‘Ākau
Pō‘ai Anu ‘Ākau (Arctic Circle)	Ao a i ‘ole pō? _____	Ao a i ‘ole pō? _____
Pō‘ai Anu Hema (Antarctic Circle)	Ao a i ‘ole pō? _____	Ao a i ‘ole pō? _____
Pō‘ai Waena Honua (Equator)	‘O ka pākēneka hea o ka Pō‘ai Waena Honua i ke ao? _____	‘O ka pākēneka hea o ka Pō‘ai Waena Honua i ke ao? _____

Nā Nīnau:

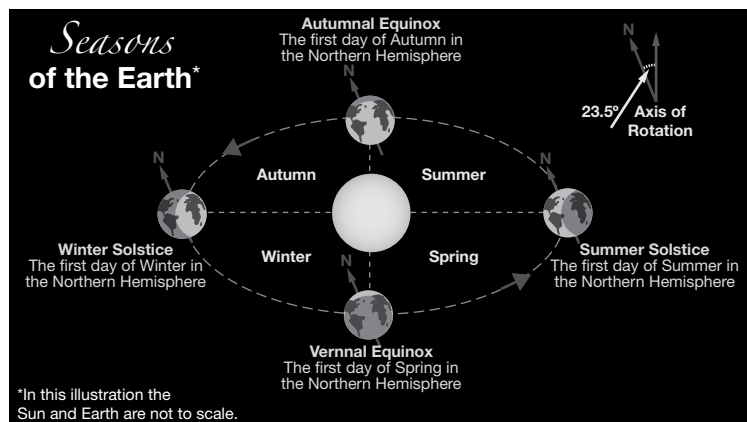
1. ‘Oko‘a ka nui o ka mālamalama o ka lā e hiki ana i ka Pō‘ai Waena Honua (Equator) i ke kauwela a i ‘ole ke kau ho‘oilolo? _____

2. Pehea ka nui o ka mālamalama o ka lā e hiki i ka Pō‘ai Waena Honua (Equator) e loli i ke anilā i nā wahi kokoke i ka Pō‘ai Waena Honua (Equator)?

3. ‘Ehia mālamalama o ka lā e pā ana i ka Pō‘ai Anu ‘Ākau (Arctic Circle) i ka wā o ke kau ho‘oilolo i ka Papa Hapa ‘Ākau (Northern Hemisphere)?

4. Pehea ka loli ‘ana o ke anilā no nā kānaka e noho ‘ana i kahi o ka Pō‘ai Anu ‘Ākau (Arctic Circle)?

5. ‘O ke kau hea i ka Pō‘ai Anu Hema (Antarctic Circle) i ka wā o ke kauwela i ka Papa Hapa ‘Ākau (Northern Hemisphere)?



Nā Pō‘ino O Ke Ao Kīkī‘i

Nā Kuhikuhi: E ho‘ohana i nā pakuhi pili i kēia ha‘awina e pane i nā nīnau.

Ka ‘Ike Hou A‘e: ‘Okō‘a ka mālamalama o ka lā e pā i ka Pō‘ai Waena Honua (Equator) ma mua o kahi o nā Polar Region i ke kau ho‘oilō a me ke kauwela. ‘O kēia ke kumu no nā ‘okō‘a o nā lauana anilā i nā wahi like ‘ole o ka Honua. ‘Okō‘a nā lauana anilā o ‘elua lua pele, ‘O Augustine kokoke i Homer, Alaska, a me ka lua pele ‘o East Maui (a i ‘ole Haleakalā) kokoke i Kahului, Hawai‘i ma muli paha o ka wahi o ia mau lua pele. Loli nā pō‘ino lua pele i ka makahiki ma muli o nā lauana anilā. He mau lua pele ‘eu nā lua pele ‘elua. ‘A‘ole lua‘i ka lua pele ‘o East Maui no nā makahiki, he nui. Ke mana‘o nei nā kānaka ‘epékema e lua‘i ‘ana ka lua pele i kēia mua aku.

1. ‘O ka wahi hea ka wahi me nā ana wela kūpa‘a i ka makahiki, Kahului, Hawai‘i a i ‘ole Homer, Alaska?

2. ‘O nā mahina mehana ‘elua hea i Homer, Alaska? _____

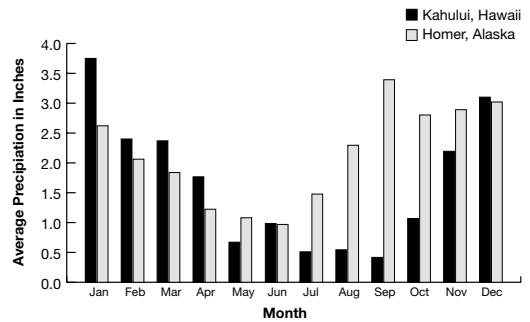
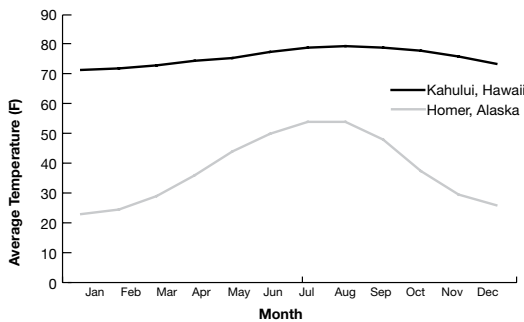
3. ‘O nā mahina ‘olu‘olu ‘elua hea i Homer, Alaska? _____

4. ‘O i a‘e ke kimu (precipitation) ma Kahului, Hawai‘i i ka mahina o Ianuali a i ‘ole Iulai?

5. ‘O i a‘e ke kimu (precipitation) ma Homer, Alaska i ka mahina o Ianuali a i ‘ole Iulai?

6. Ma muli o nā ana wela ‘awelika, ‘o ka mahina a i ‘ole nā mahina hea e hā‘ule ke kimu (precipitation) ma ke ‘ano he hau i Homer, Alaska? _____

7. Ma muli o nā ana wela ‘awelika, ‘o ka mahina a i ‘ole nā mahina hea e ho‘okumu ka hau ma ka lua pele ‘o Augustine? _____



Nā Pō'ino O Ke Ao Kīki'i

Nā Kuhikuhi: E ho'ohana i ka 'ike mai ke pā DVD *Ola Ka Honua: Volcanoes Alive* a me nā pane pili i nā pō'ino lua pele ma Augustine kokoke i Homer, Alaska a me ka lua pele East Maui kokoke i Kahului, Hawai'i. He memo: *He lua pele kuahene 'o East Maui a he lua pele ahupapa 'o Augustine.*

8. E ho'ohana i ka pō'ino ho'okūkohukohu, e koho i ka pelemaka e ho'okumu ana i ka lua pele 'o Augustine. E koho i nā 'ano o ka wai o ka lua pele 'o Augustine i ka mahina 'o Ianuali? He aha nā pō'ino e hana ana?

9. E ho'ohana i ka pō'ino ho'okūkohukohu, e koho i ka pelemaka e ho'okumu ana i ka lua pele 'o Augustine. He aha nā pō'ino e hana ana i kekahi mahina me ke kimu (precipitation) li'ili'i a i 'ole ke kimu 'ole?

10. E ho'ohana i ka pō'ino ho'okūkohukohu, e koho i ka pelemaka ka mea e ho'okumu i ka lua pele 'o East Maui. He aha nā pō'ino e hana ana i nā mahina me ka ua nui?

11. E ho'ohana i ka pō'ino ho'okūkohukohu, e koho i ka pelemaka ka mea e ho'okumu i ka lua pele 'o East Maui. He aha nā pō'ino e hana ana i nā mahina me ka ua li'ii'i a i ole me ka ua 'ole?

12. E nānā hou i ka pakuhi kimu (precipitation). He lua pele pahū 'o East Maui i ka mahina Iune a i 'ole Kēkēmapa? _____