

Science Learning Options

Choose 1 activity to do each day.



Mālama ‘Āina (care for the land)

Watch the video to see how Kumu is trying to mālama the overgrown ‘āina where she lives. What changes do you kilo? What do you wonder about? Think about some of the plants you have growing in your own yard. What plants might be helpful for Kumu to grow in her yard? Why? Help Kumu make a plan to improve her yard. Draw and label a picture of the plants you think Kumu should plant in her yard. Explain why she should plant them.

Weather Observations (Ka Wai a Kāne - Water cycle)

<https://mysteryscience.com/weather/mystery-1/water-cycle-phases-of-matter/46?r=10420779>

With an ‘ohana member, kilo the photos and video clips on the weather observation charts. Discuss what you notice, what you wonder, and any predictions you have. Next, click on the link above to watch the Mystery Science video about the water cycle. Discuss something new you learned. Then, review the water cycle model chart. After, kilo the before and after chart photos. Where did the water go? Draw and label a diagram to show your thinking. Finally, go outside and look for evidence of Ka Wai a Kāne - the water cycle in your backyard. Draw and label a picture of the parts of the cycle you observed.

Changes in Nature (Kōlea Birds)

With an ‘ohana member, look at the 3 photos of the Kōlea hatchling, juvenile, and adult. Discuss what you think you know about Kōlea birds. Then, read the Kōlea text with this question in mind: How did Kōlea help early Hawaiians understand changes in Ho‘oilo (wet season) and Kauwela (dry season)? In the text, kilo the Kōlea that visited my backyard. Is this Kōlea male or female? How do you know? Think about the Kōlea we observed at Mountain View Elementary. What might it look like now (male or female)? Make a scientific drawing of what you predict the Kōlea would look like now.

Mystery Science Why Do Birds Lay Eggs?

<https://mysteryscience.com/mini-lessons/birds-spring#slide-id-8400>

Birds living in areas that have 4 seasons usually lay their eggs in Spring (March-May). In Hawai‘i, birds lay eggs during these same months, but our seasons are different. With an ‘ohana member, click on the link to watch the Mystery Science video about why birds lay eggs in spring. Discuss what you learned. Then, look at the bird nests Kumu found in her backyard. Birds are amazing engineers! Be a bird nest engineer. Make a model of a bird’s nest. Think about the natural materials you have in your backyard. Sketch your ideas. Gather the materials. Build your nest model outside. Test it out.

Animal Traits Lizards, Lizards...Everywhere

With an ‘ohana member, look at the photos and video clip on the observation chart. What do you kilo? What do you wonder? What are some predictions you have. Record your observations, questions, and predictions on the chart. Then, go outside and look for lizards in your backyard. Make a list of the places you found them. How many different types of lizards did you find? How were their traits similar? How were their traits different? What advantages do those traits have in helping the lizards survive in your backyard?

Backyard Science (Letter Writing)

Think about all the things you have been able to kilo in your backyard, such as:

Birds	Lizards	Ants	Slugs	Bees
Flowers	Trees	Rocks	Shadows	
Reflections				
Lifecycles	Weather	Changes in Nature		

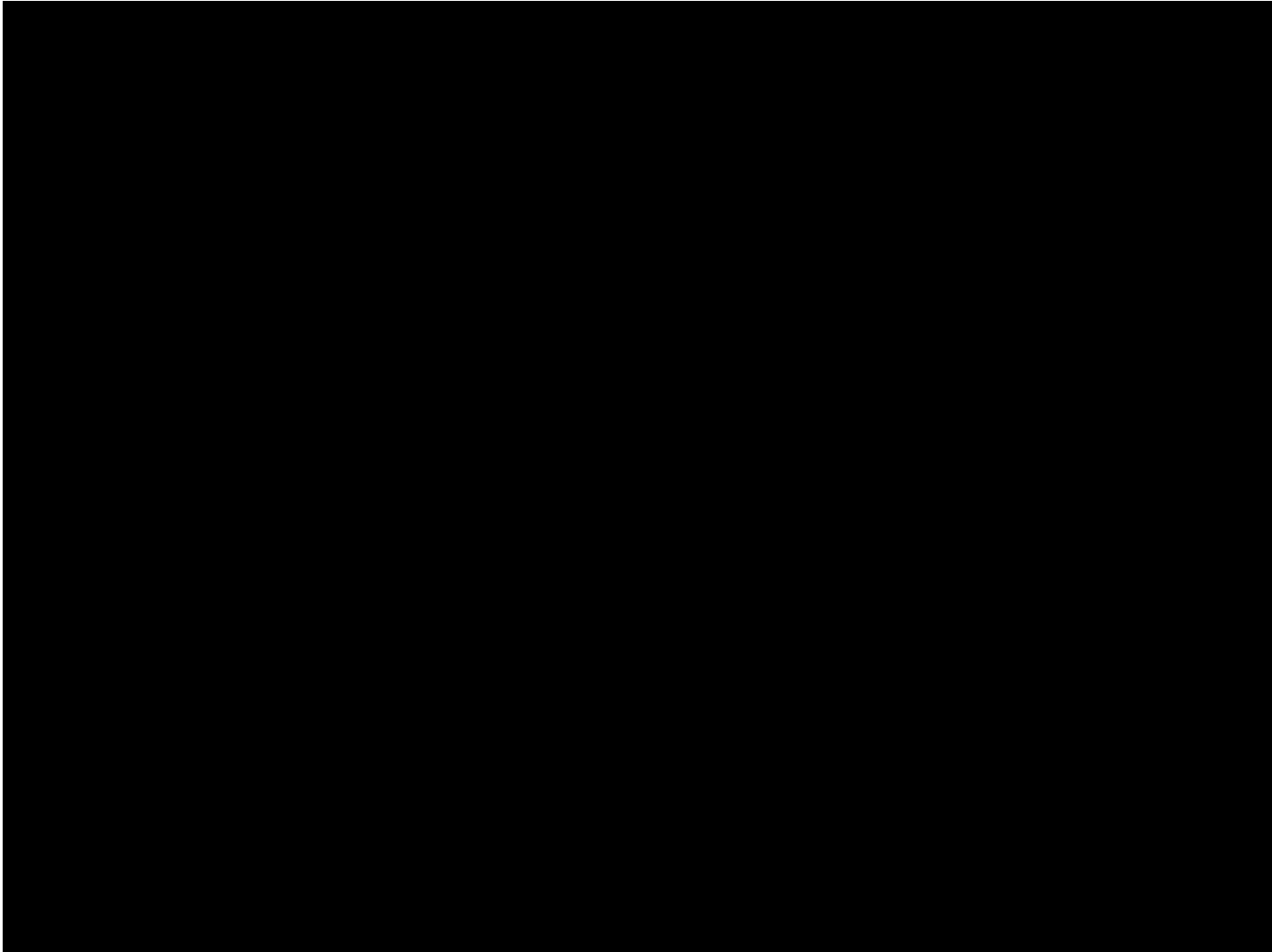
Write a letter to Kumu telling her about the different things you’ve discovered in your backyard. What has been most interesting to kilo? What has surprised you? What would you like to learn more about? I look forward to hearing from you!



Mālama 'Āina

(care for the land)

Watch the video to see how Kumu is trying to mālama the overgrown 'āina where she lives. What changes do you kilo? What do you wonder about?



Mālama 'Āina

(care for the land)

Think: What plants would be helpful for Kumu to have in her yard? Why? Help Kumu make a plan to improve her yard. Draw and label a picture of the plants you think Kumu should plant. Explain why she should plant them.

Draw, color, and label a picture of the plants Kumu should plant in her yard.

Explain why Kumu should plant them.



Weather Observations: Ka Wai A Kāne - Water Cycle

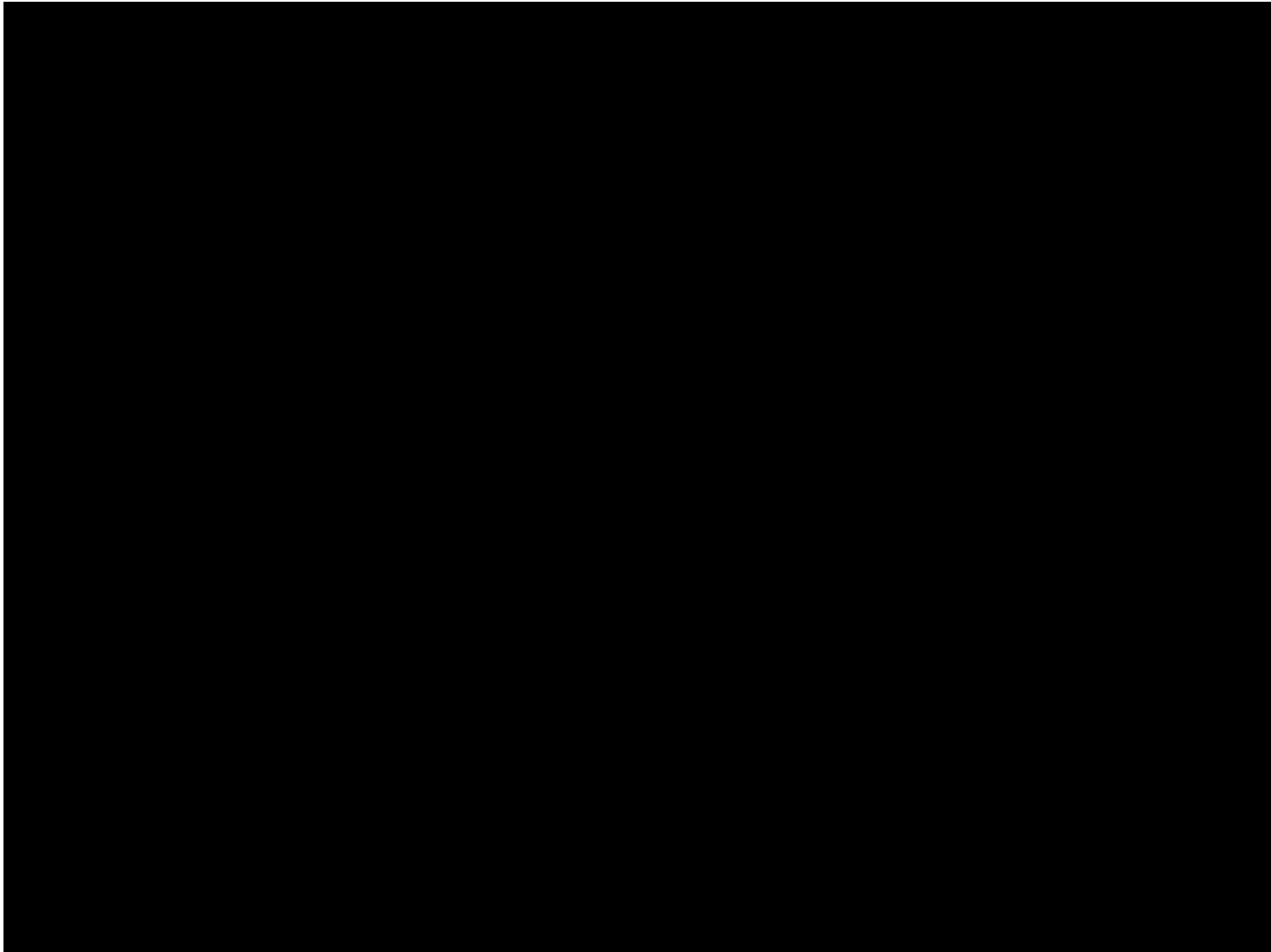
<https://mysteryscience.com/weather/mystery-1/water-cycle-phases-of-matter/46?r=10420779>

With an 'ohana member, kilo the photos on this slide and watch the video clips on the next two slides. Discuss what you observe, what you wonder about, and any predictions you may have. Then, click on the link above to watch the Mystery Science video about the water cycle.



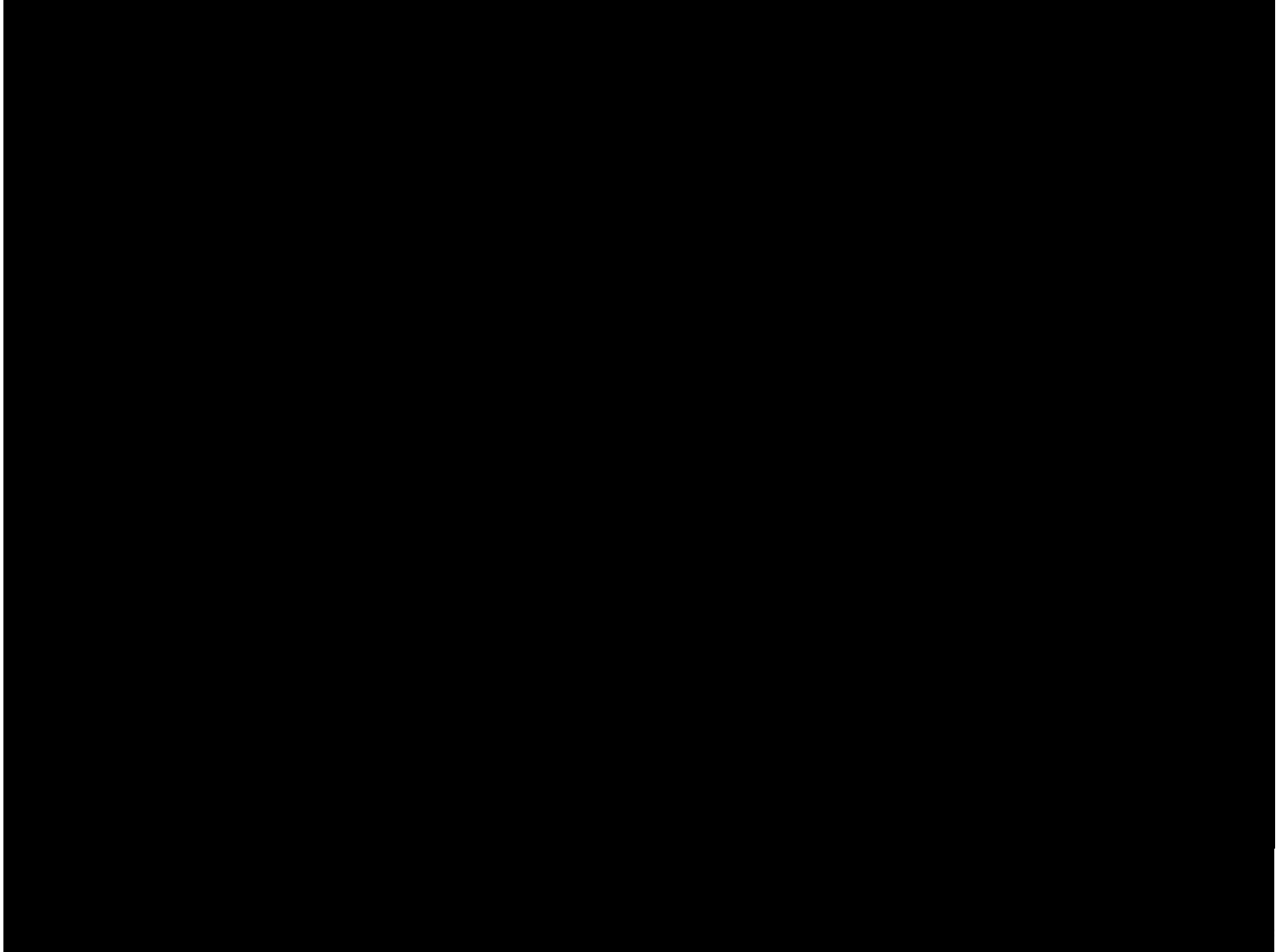
Weather Observations: Ka Wai A Kāne - Water Cycle

With an 'ohana member, kilo the video clip. Discuss what you observe, what you wonder about, and any predictions you may have.



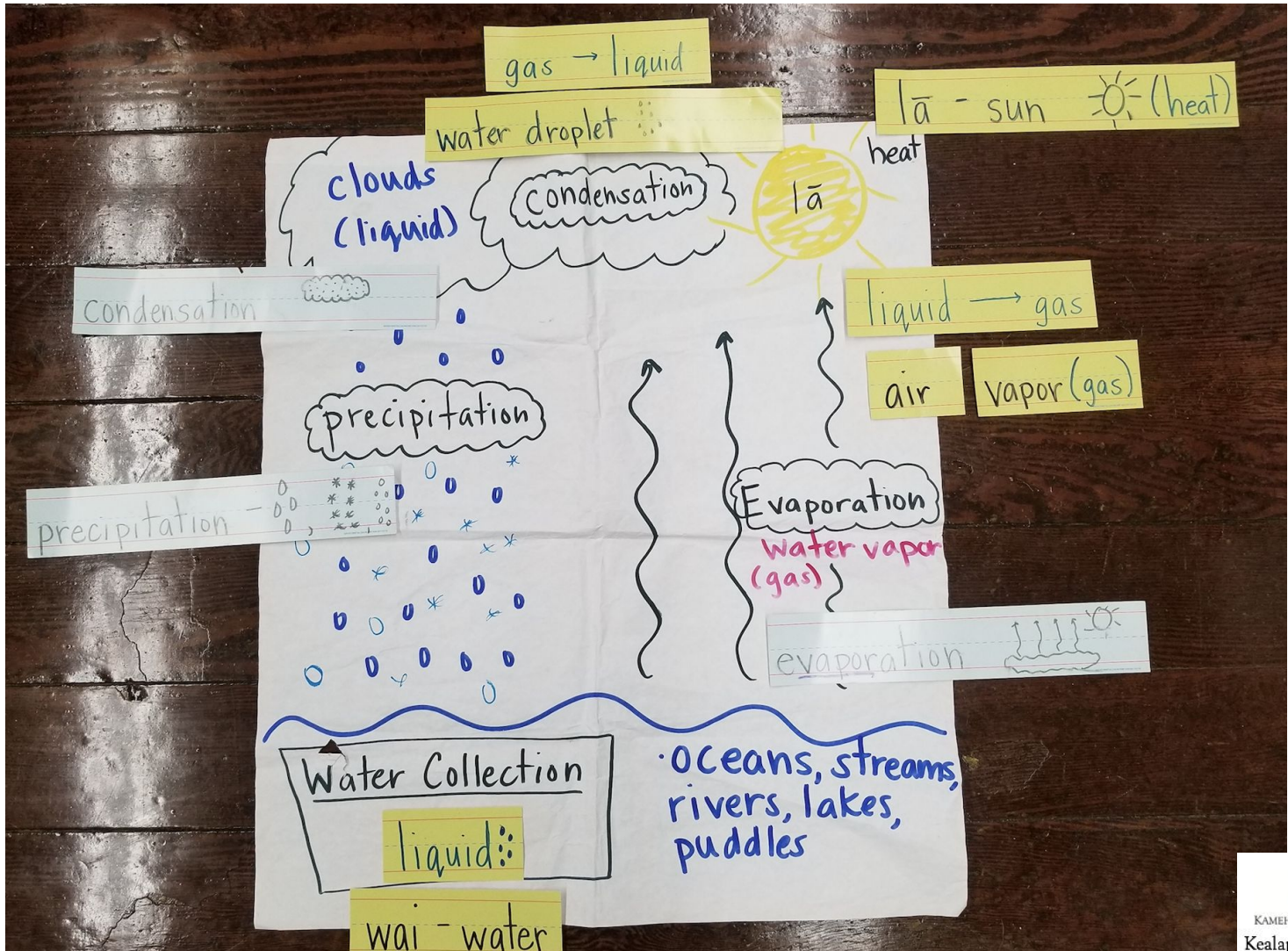
Weather Observations: Ka Wai A Kāne - Water Cycle

With an 'ohana member, kilo the video clip. Discuss what you observe, what you wonder about, and any predictions you may have.



Weather Observations: Ka Wai A Kāne - Water Cycle

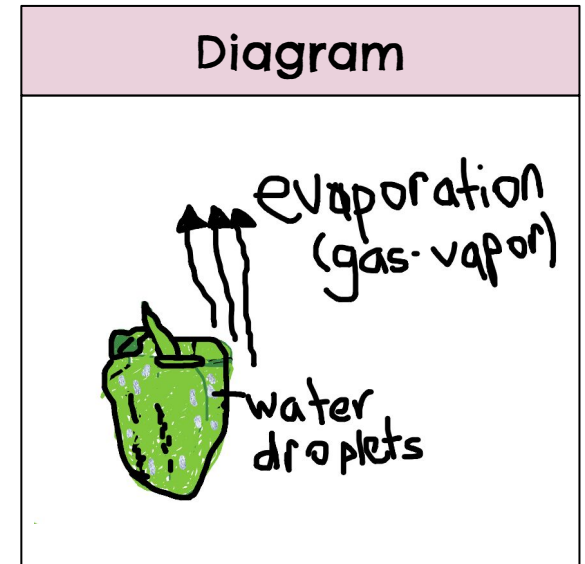
Review the water cycle model and key vocabulary: wai (water), liquid, water collection, evaporation, condensation, precipitation, air, vapor (gas), lā (sun), water droplets, clouds.



Weather Observations: Ka Wai A Kāne - Water Cycle

Kilo the before and after photos. Where did the wai (water) go? Draw and label a diagram to show your thinking. Refer to the water cycle model and key vocabulary to help you.

Example:



Weather Observations: Ka Wai A Kāne - Water Cycle

Kilo the before and after photos. Where did the wai (water) go? Draw and label a diagram to show your thinking. Refer to the water cycle model and key vocabulary to help you.

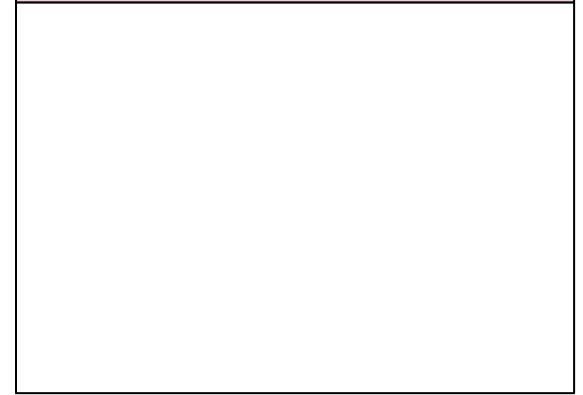
Before



After



Diagram



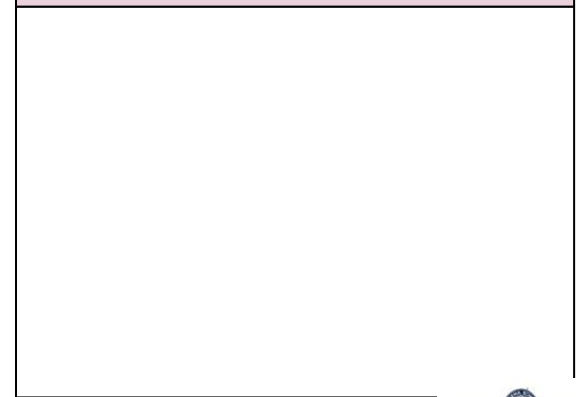
Before



After



Diagram



Weather Observations: Ka Wai A Kāne - Water Cycle

Go outside and look for evidence of Ka Wai a Kāne - the water cycle - in your backyard. Draw and label a picture of the parts of the cycle you observe.



Changes in Nature

(Kōlea Birds)

Kōlea Birds

By Kumu Cariaga





Kōlea (hatchling)



Kōlea (juvenile)





Kōlea (adult)



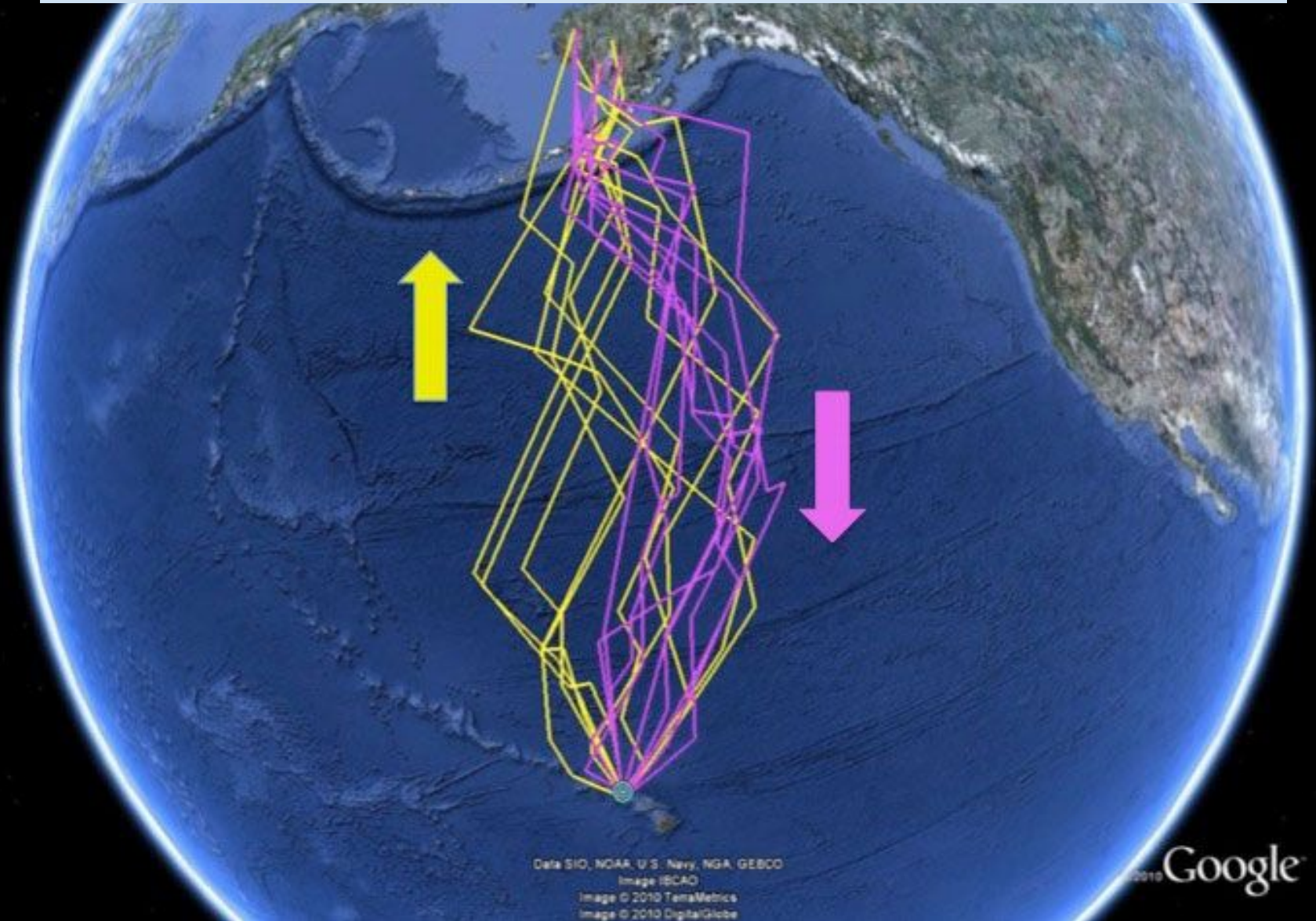
Photo: R Kikuo Johnson



Kōlea are migratory shore birds. In late August, Kōlea adults embark on a 3,000 mile journey from Alaska to Hawai'i. Travelling non-stop for 3 -4 days, they arrive exhausted and are ready for some rest. To early Hawaiians, Kōlea's arrival was one sign that **Kauwela (dry season)** would soon be changing to **Ho'oilō (wet season)**. Did you know, both male and female Kōlea have light brownish-gray plumage (feathers) when they arrive in Hawai'i? This makes it difficult to tell them apart.

Photo and caption: Phys.org

Geolocator tracks of plovers migrating northward (yellow) in spring from Hawaii to Alaska, the reverse in fall (purple). The figure shows data from the 2009 portion of the study.



In Hawaiian, one meaning of the word kōlea is “one who takes and leaves.” Kōlea are sometimes viewed as greedy birds because they have two homes: one in Alaska and the other in Hawai‘i. In Hawai‘i, it is believed Kōlea take what they need from the ‘āina (eat and get fat) then leave the islands to go back to Alaska.

Living in Alaska (end of April to August)

Advantages:

- Tundra warms up and snow melts
- Space - vast nesting areas; little competition for territory
 - Kōlea mate and raise their hatchlings
- Food - large amounts of insects
- Light - long hours of daylight. Chicks can eat all day/all night and grow up fast

Disadvantages:

- Flight hazards on way to Alaska
 - Poor weather - blown off course; confused by foggy conditions; get tired - no place to stop and rest
- Predators
- Lack of food caused by late snowmelt



Photo: O.W. Johnson © 2016



Photo: BigIslandNow.com

Kōlea parents mālama their hatchlings. When the chicks are ready, Kōlea parents teach them how to forage for their own food. As the chicks learn how to fly, one parent may leave the nest - usually the mother. She may join other adults to begin her migration to Hawai‘i. Adult male Kōlea usually stay with juveniles until they depart for Hawai‘i. The juveniles will make the long journey in October.

Photo: Dan Murphy © 2016



Photo: MyBirdingJourney.com



Image: TravelOnline.com

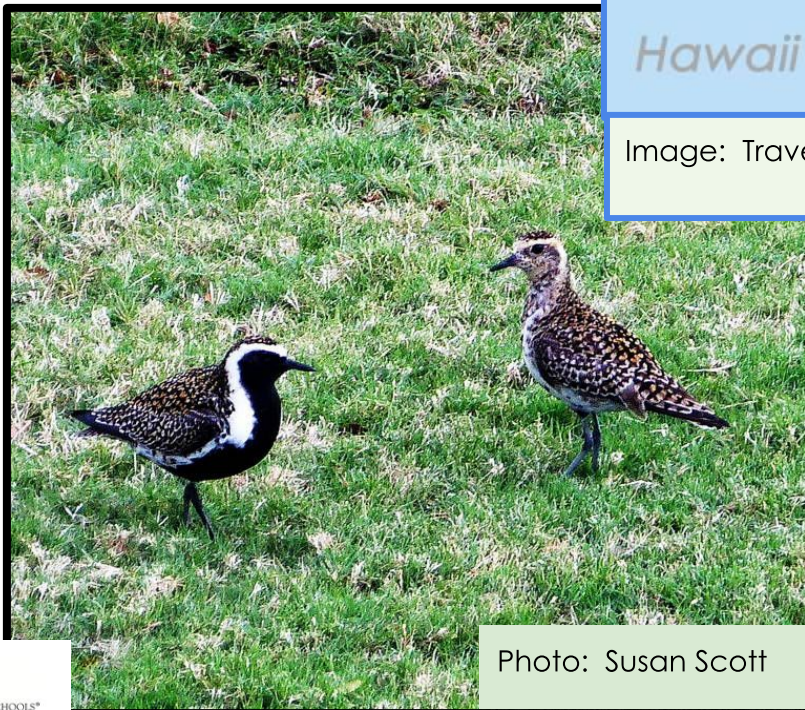


Photo: Susan Scott

Living in Hawai'i (around August to end of April)

Advantages:

- Kōlea have time to recover from long flight from Alaska
- Warm tropical climate; no snow
- Food - roaches, earthworms, slugs, geckos, flowers, leaf parts

Disadvantages:

- Space - crowded wintering grounds
- competition for territory; Kōlea return to same place as previous year
 - Introduced predators





Male in April



Female in April

During Ho'oilō, Kōlea slowly lose their brownish-gray plumage. Dark black, bright gold, and snowy white breeding plumage gradually replace the dull feathers. This is called molting. To early Hawaiians, these changes in Kōlea's plumage were one sign that **Ho'oilō (wet season)** would soon be changing to **Kauwela (dry season)**. Kilo. How are the male and female Kōlea alike? How are the male and female Kōlea different?

From November through February, this Kōlea frequently visited my backyard. I watched for changes in its plumage. I was curious to know if it was a male or female Kōlea. During March and most of April, the Kōlea was absent from my yard. I knew it was too soon for Kōlea to make the long trek back to Alaska. I wondered what happened to my feathered friend. THEN, out of nowhere... it reappeared. I discovered its gender. Is this Kōlea male or female? How do you know?



**I believe
it's time for
me to fly...
...back to
Alaska.**



As I moved closer, trying to get a better view, the female Kōlea flew over the fence into my neighbor's yard. Watch the short video clip to see how she moves across the grass.



Kōlea Bird Scientific Drawing

Think about the Kōlea we observed at Mountain View Elementary. What might it look like now in late April (male or female)? Make a scientific drawing of what you predict the Kōlea would look like now.



Mystery Science - Why Do Birds Lay Eggs?

(Backyard Nests)

Look at the nests Kumu found in her backyard. How are they alike? How are they different? What materials are the nests made out of? How do the nests stay together? How strong do you think the nests are? What type of birds do you think live in these nests?



Mystery Science - Why Do Birds Lay Eggs?

(Backyard Nests)

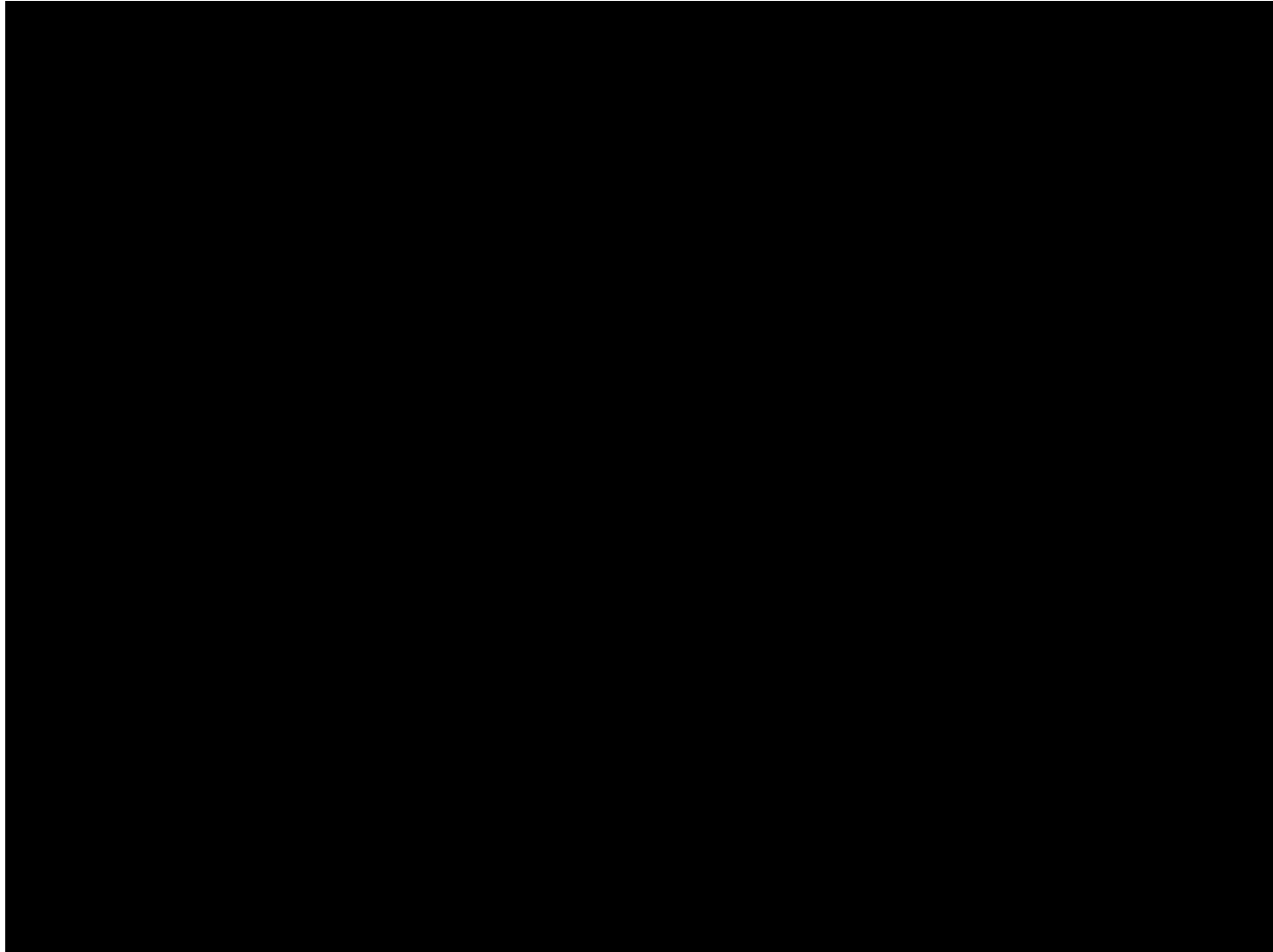
Watch the video of the Spotted Dove in its nest in Kumu's avocado tree. How strong do you think this nest is? Why?



Mystery Science - Why Do Birds Lay Eggs?

(Backyard Nests)

Here's another view of the Spotted Dove in its nest in Kumu's avocado tree. How strong do you think this nest is? Why?



Mystery Science - Why Do Birds Lay Eggs?

(Bird Nest Engineering)

With an adult 'ohana member, imagine you just found an injured bird in your backyard. You would like to build the bird a nest to make it feel comfortable as it heals. You may only use natural materials found outside (no glue, scissors, tape, etc) Here's your engineering task...

1. Think about the natural materials you have outside.
2. Draw a model of what the nest will look like.
3. Label the parts.
4. Gather the materials you'll need.
5. Construct the nest as it appears in your model drawing.
6. With adult supervision, test it out.
 - a. Use a fan to mimic the wind
 - b. Pour water over the nest to see if the water pools or drains out

*****Do not use the fan near water!**

Questions to consider...

- How strong can you make the nest?
- How will the nest stay together under windy conditions?
- How deep does the nest need to be?
- How will the nest be protected from rain?
- What will happen if water gets inside the nest?
 - Will it collect or pool?
 - Will the water drain out?

Model drawing of nest.



Test it out. Example: I used a fan to mimic wind. This is what happened...

Test it out. Example: I used water to mimic rain. This is what happened...



My nest model (worked or didn't work) because...

One thing I will change is... (remember to use "because" to explain your thinking.)

Make the changes to your nest, then retest your model.



Observation Chart: Animal Traits

Lizards, Lizards...Everywhere!

With an 'ohana member, look at the photos and video clip on this slide and the next 2 slides. What do you kilo? What do you wonder? What are some predictions you have. Record your observations, questions, and predictions on the chart.



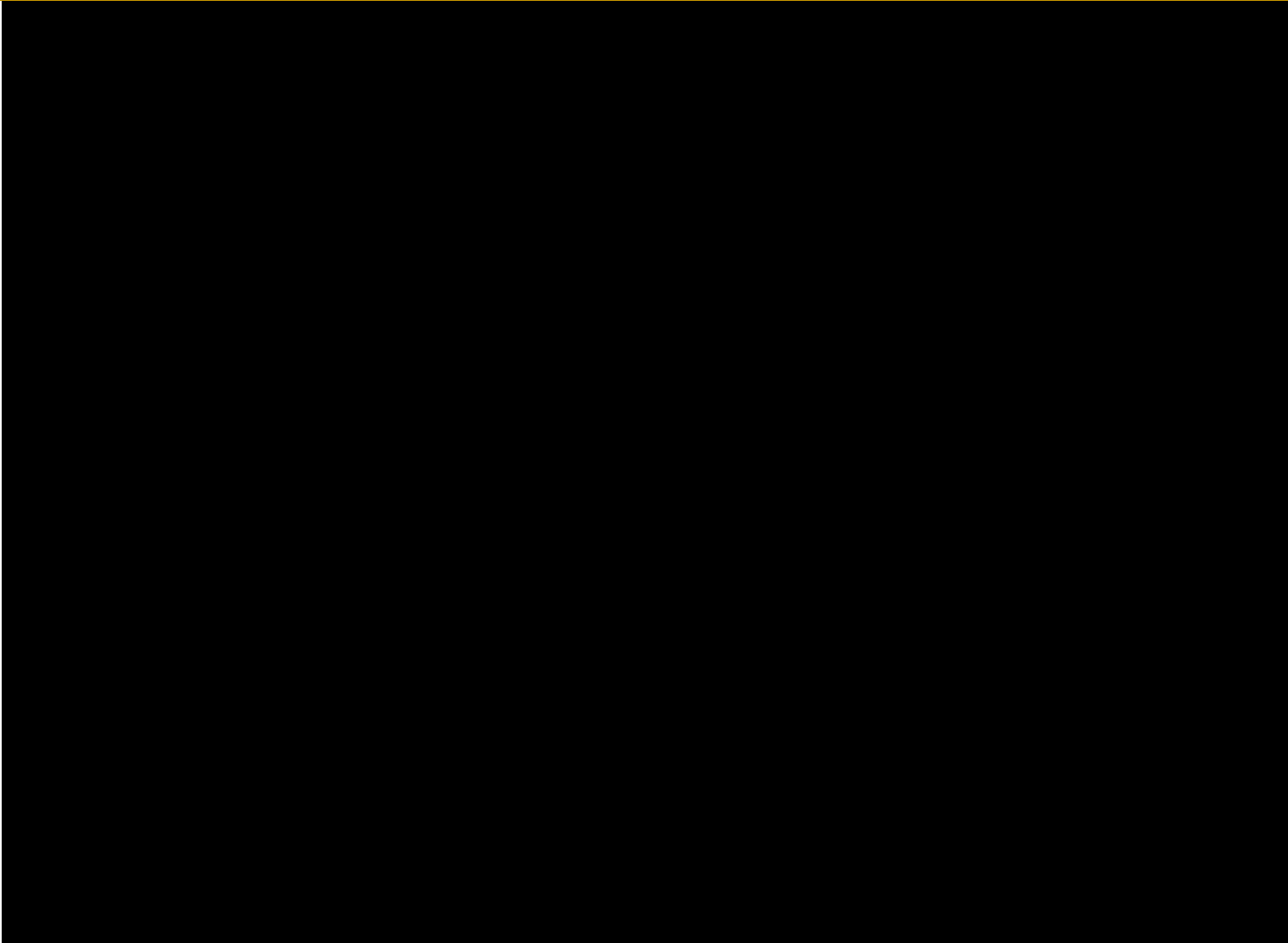
Animal Traits:

Lizards, Lizards...Everywhere!



Animal Traits:

Lizards, Lizards...Everywhere!



Observation Chart: Animal Traits

Directions:

1. Scan (quickly look) all the pictures on the chart.
2. Choose one picture to kilo closely.
3. Record what you observed in that picture using details.
4. What do you wonder? Write a question you have.
5. Make a prediction based on what you observed and wondered about.
6. Select another picture to observe. Repeat steps 3-5.

Remember to use a bullet for
each new idea.

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<u>First</u> <u>Observations (kilo)</u> I kilo... I observed... I noticed...	<u>Next</u> <u>Questions (nīnau)</u> Who? What? When? Where? Why? How?	<u>After</u> <u>Predictions (wānana)</u> I predict.... I think.... "because"

Based on your observations, what do these pictures have in common? Explain.

Animal Traits:

Lizards, Lizards...Everywhere!

With an 'ohana member, go outside and look for lizards in your backyard. Remember... keep a safe distance and use only your eyes to observe. Make a list of the different places you spotted the lizards. Think: How many different types of lizards did you spy? How were their traits similar? How were their traits different? What advantages do those traits have in helping the lizards survive in your backyard?

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BACKYARD SCIENCE

LETTER WRITING

Write a letter to Kumu telling her about the different things you've discovered in your backyard. What has been most interesting to kilo? What has surprised you? What would you like to learn more about? I look forward to hearing from you!

