

Name: _____

Date: _____

Observation

Materials

1 green ti leaf
metric ruler

1 dry brown ti leaf

Steps & Procedure:

1. Make a table like the one below on the back of your paper.

| Observation | Sense or Instrument Used |
|-------------|--------------------------|
| | |

2. Make 4 observations about your ti leaf using the senses of **sight**, **touch** and **smell**. Record your observations in the table.
3. Record 4 observations about your ti leaf using the tape measure.
4. Repeat steps 1-3 for the dry ti leaf. Record your observations on it's own table.
5. Review your observations. Place an "S" in front of each observation that was the same for both the green ti leaf and the dry ti leaf. Place a "D" in front of the each observation that was different.
6. Discuss the similarities and differences of the green ti leaf as compared to the dry ti leaf and discuss reasons for this.

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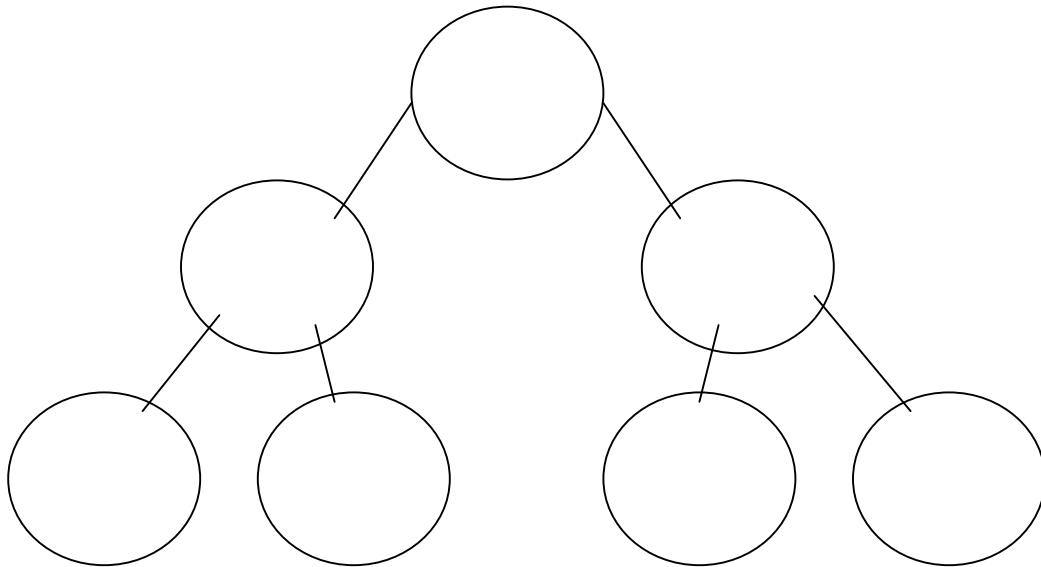
Classifying

Materials:

ti leaf display

Steps/Procedure:

1. Observe and study the ti leaf display.
2. Classify the ti leaves. Use the web chart below. First, classify the ti leaves into 2 groups. In the top circles, write the features of the ti leaves (size, shape, color and so on) that you need to sort the ti leaves. Continue to classify until each ti leaf is in a circle by itself.



3. Choose a ti leaf. Describe to your partner the features you used to classify the ti leaves into groups. Can your partner identify the ti leaves? Yes? No? Why or Why not?

Estimating

Materials:

4 fresh ti leaves of various sizes 4 ti dry ti leaves of various sizes
pens string ruler large paper clips

*Select leaves under 12 inches for easier estimations.

Steps:

1. Group the class into four groups, each group to have materials listed above.
2. Number the fresh ti leaves from 1 to 4. Number the dry ti leaves from 1 to 4.
3. Estimate the length of the fresh leaves and the dry leaves using inches and Hawaiian forms of measurements.
4. Estimate the weight of the each numbered fresh ti leaves and dry ti leaves using the predicated weight as compared to large paper clips (ex. the estimated weight of dry ti leaf #1 is equal to 3 large paper clips).
5. Write all estimations on chart below.

| Fresh Ti Leaf | Length (in.) | Length (Hawai'i) | Weight (amt. of ppr clips) |
|---------------|--------------|------------------|-------------------------------|
| #1 | | | |
| #2 | | | |
| #3 | | | |
| #4 | | | |

| Dry Ti Leaf | Length (in.) | Length (Hawai'i) | Weight (amt. of ppr clips) |
|-------------|--------------|------------------|-------------------------------|
| #1 | | | |
| #2 | | | |
| #3 | | | |
| #4 | | | |

| Dry Ti Leaves | Length (in.) | Length (Hawai'i) | Weight |
|---------------|--------------|------------------|--------|
| #1 | | | |
| #2 | | | |
| #3 | | | |
| #4 | | | |

Conclusion:

1. Looking at all the data collected, compare your findings with the data collected above to your estimated data on the previous lesson.

Extension:

Save the fresh ti leaves labelled 1 - 4 until dry. When completely dry, remeasure its length and weight and compare it to its measurements and weight when it was fresh.

Measuring (No ke Ana 'Ana)

Materials:

4 fresh ti leaves string large paper clips
4 dry ti leaves tape wooden chop sticks
ruler

*Use same ti leaves from previous lesson on "Estimating".

Steps: (Use same student groupings from previous lesson.)

Length:

1. Using a string, measure the length of each fresh ti leaf from tip to bottom of stalk, then cut the string. Measure the string using a ruler to the closest inch and record data on chart below. Then using the Hawaiian form of measurement, measure the string and record data. Use the same method to measure the dry ti leaves.

Weight:

1. Measure a piece of string 20 inches long and cut. Tie one end of this string in the middle of a chop stick that has already been split in half. Tape the other end of the string to the edge of a table. The chop stick should be balanced, if not, adjust until balanced and level with the floor below.

2. Tape one fresh ti leaf to one end of the chop stick. Using large paper clips, rebend clips so that they can easily hang on the other side of the chop stick, hanging as much clips needed until chopstick is balanced. Write the data below on the chart. Use the same method to measure the dry ti leaves.

| Fresh Ti Leaves | Length (in.) | Length (Hawai'i) | Weight |
|-----------------|--------------|------------------|--------|
| #1 | | | |
| #2 | | | |
| #3 | | | |
| #4 | | | |

Hypothesizing

Materials:

ti leaf stalks

Steps:

1. Observations often lead to questions. A question can be restated as a problem that will need to be solved. When a possible answer to the question can be given, this is called a hypothesis.

2. Practice developing a hypothesis below.

Problem

How does the color of the ti-leaf affect the color of the natural dye that is extracted?

Hypothesis

The color of the leaf will be the color of the natural dye/juices that are extracted.

Test for hypothesis

Iron leaves until soft and twist leaves of the same color together to extract natural dyes/juices on a white napkin.

How does the method of splitting a ti-leaf by hand affect the outcome of having 2 equal parts?

How does the size of the ti-leaf affect the time it will take to reach the ground when dropped from a specific height?

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Communicating

Materials:

| | | |
|----------------------------------|----------|-------------|
| 2 green ti leaves | scissors | yarn/string |
| felt tip pens | tape | glue |
| construction paper (multicolors) | | |

Steps/Procedure:

1. Get a green ti leaf.
2. Using the green ti leaf and the art supplies available to you, create and construct an animal. You choose what animal you would like to create using your ti leaf and the art supplies. Do your own work in your area and do not exchange ideas or look at another's work.
3. Write step-by-step instructions explaining how you made your animal. Use the spaces below.

4. When you have finished your step-by-step instructions, exchange this skill sheet with a partner. Make his/her animal. Follow the directions given to you by your partner.
5. Compare your animal with the one first made by your partner. How are they alike? How are they different? Why?

6. Work with your partner to rewrite any steps that were unclear. Use the back of this sheet if you need more room.

Ka Papa Hua'ōlelo Hou
Word List

1. ka 'ike sense
ka 'ike i ka 'ono (sense of taste), ka 'ike i ka maka (sense of sight)
2. ka mea pa'ahana instrument
3. a. ka lula mekilika metric tape
e. ka lula mekele
4. ka nānā 'ana observations
5. ka ho'onohonoho classify
6. ka papa ho'onohonoho classification board
7. ka hi'ohi'ona features
8. ka hō'ike; ka hō'ike'ike display
9. ka hō'oa identify
10. ka ho'okolohua to perform an experiment
11. koho estimating
12. ana measuring
14. wānana i ke kuhiakau hypothesizing
15. ka'a'ike communicating
16. kālailai 'ikepili analysis