

Section One: Teacher Notes

Eight activities guide students as they learn plant collecting etiquette and examine leaf structure.

TEACHER NOTES: SECTION ONE

Summary:

Students begin a log book and explore what they already know about plants. They learn collecting etiquette and examine leaf structure. Some of the work in this part is done outdoors. If appropriate, you may wish to invite Elders and/or local experts into the class. Please see “ELDERS AND EXPERTS” in the Introduction for guidance and adjust your timeline, accordingly.

Objectives:

Alaska Standards

To understand the varied growing conditions needed by different plants.

To learn indigenous plants’ names and characteristics

Science: A. 12, 14, 15; B. 1, 5; C. 1, 5; D.1

World Languages: B. 1

Geography: C. 1, 2

Mathematics: A. 5

Skills for a Healthy Life: B. 1, 3

To understand local cultural heritage and responsible conduct in the environment.

English: A. 1; C; D. 1; 2, 3; E. 1

Cultural: A. 3, 4, 5, 6; B. 2; C. 1, 3; E. 1, 2

History: B. 1

Arts: A. 3

Materials:

- log book
- pen, pencil
- large paper sheets to use for a class record
- plastic bags, either zip-loc or with twisties, one per student
- waterproof marking pen
- contact paper or laminating film
- manila file folder-style paper or similar paper
- plant press (see “NOTES on COLLECTING, PRESSING . . .” in the Introduction)
- Leaf and Flower Card from the Appendix * copied, cut apart, and laminated
- Plant Illustration Cards from the Appendix * copied, cut apart, and laminated
- field guides (see Resources in Appendix)
- hand lens
- wax paper, (optional)
- iron, (optional)

(*included with unit)

TEACHER NOTES: SECTION ONE

Activities

WHAT DO STUDENTS KNOW ALREADY ABOUT PLANTS?

ACTIVITY ONE. Students make a log book to record their work.

Inside activity

Estimated duration: 20-30 minutes

The log book can be simple, folded sheets of paper that are stapled together, or an elegant hand-sewn set of pages. It can be a school test booklet or a purchased hard-cover journal. You may want to make a few samples so that you are satisfied with the potential outcome of the products the students will be making. A scientific log of botanical study could be a real keepsake. Students will make a cover for the log book in ACTIVITY FIVE.

ACTIVITY TWO. Students explore what they already know about plants while visiting an outside location. They write in their log books and assemble a class record of their individual writings. (pre-assessment)

Outside activity/Inside activity

Estimated duration: 40-60 minutes

Because you will need to locate and identify 5 habitat areas containing flowering plants for future lessons, you may wish to use one of them for this pre-assessment. Suggestions for habitats include: beach, bog, sheltered valley, exposed mountain, and meadow.

Form a circle with your students and look at and discuss the plants growing in that circle. Do they recognize any plants in the circle? If not, you may wish to shift the circle's location to another place.

LEAVES

If you are fortunate enough to work on this unit when the plants are in full flower, then you may wish to fast-forward to SECTION TWO so that you capture the plants in full bloom. You may return to SECTION ONE later.

ACTIVITY THREE. Students review collecting strategy and etiquette and collect 5 leaves each. Students discuss leaf collections in whole class group to model leaf descriptions discussion to follow.

Inside activity/Outside activity

Estimated duration: 60-80 minutes

Discuss collection cautions and strategies. Include advice from Elders and local experts, if available. As a guide to local behavior, you may wish to review "The Right Way to Live as an *Unanga*" in the Appendix. Look at "NOTES on COLLECTING, PRESSING . . ." in the Introduction for additional suggestions. If your class day ends here, label and store the leaves in plastic bags in a refrigerator for use in ACTIVITY FOUR.

ACTIVITY FOUR. Students closely examine leaves collected in ACTIVITY THREE and work in teams to describe them using observation language rather than opinion language. They match leaves to the plants from which they came. Students record leaf information in their log books and press the leaves.

Inside activity/Outside activity

Estimated duration: 60-80 minutes

TEACHER NOTES: SECTION ONE

ACTIVITY FIVE. Teacher models “Pick a Place” while students are outside for ACTIVITY FOUR.

Outside activity
Estimated duration: 15-20 minutes

Show students how you, personally, make observations in the outdoors. Describe what you see in your “Place.” Hold a log book and write as your state your observations. Explain that student homework will be to “pick a place” that is their own and which they will observe every few weeks during the year (or for whatever time duration you select.) They will write their first description of their place in a few sentences. This activity is adapted from “Personal Plot Journals,” *Science and Children*, September 1996, p. 22.

ACTIVITY SIX. Students make a cover for their log books using collected leaves.

Inside activity
Estimated duration: 30-40 minutes

Depending on pressing techniques, you may need to delay completion of the activity until the leaves are fully dried.

ACTIVITY SEVEN. Students complete work sheet on leaf vocabulary.

Inside activity
Estimated duration: 10-15 minutes

Depending on pressing techniques, you may need to delay completion of the activity until the leaves are fully dried.

ACTIVITY EIGHT. Students prepare questions to ask Elders or experts about how leaves were collected, preserved and used.

Inside activity
Estimated duration: 10-15 minutes

Assessment opportunity: When shown a leaf, randomly selected by the teacher, student describes 3 or more leaf characteristics using appropriate vocabulary

Assessment rubric

Students and teacher complete-assessment rubrics.

Teacher Assessment Rubric, Section One	Date: _____		
Name of student: _____			
	1 Always	2. Sometimes	3. Never
Student: Stays on task.			
Completes work.			
Asks questions.			
Works cooperatively with peers and gains insight from their activities.			
Respectful of values.			
Respectful of Elders. (if included in this section)			

NOTES:

Section One

Eight activities guide students as they learn plant collecting etiquette and examine leaf structure.

Unangam Hitnisangin/Unangam Hitnisangis/Aleut Plants

SECTION ONE

Qaqamiîguŋ qalgadam ukulganaa ngiin ugutaasakun. (E)
Qaqamiîguŋ qalgadaŋ anġaġiŋ ngiin aŋtanaa akuŋ. (W)
Subsistence is sustenance for the life.

How would you survive if you were lost in the mountains? What would you live on if you were fishing and your boat were suddenly dashed ashore? What if all the grocery stores and other modern conveniences disappeared tomorrow?

What kinds of plants would you use to feed yourself, to heal yourself, to keep yourself warm? Do you know how to use the natural stores of the land and the sea?

Some people think of the Aleutian/Pribilof Islands as windy, barren, cold and uninviting. With their mild winters, generous rainfall, and volcanic soils, however, these islands have provided

well for the people for thousands of years. In fact, these islands were the setting for an advanced and innovative culture whose members were expert at using resources in all parts of the environment.

Plants were among the most important resources the people used. Plants provided food that added variety and nutrients to the diet. The people gathered wild fruit, bulbs and roots. They harvested stems, leaves and sprouts for food. They treated their

illnesses, wounds and pains with plant parts. On treeless islands, woody shrubs supplied fuel, and grasses supplied insulation and materials to make socks, containers, and wall and floor covering. Through decades of learning from their Elders, the people came to know how to survive from the resources of the land and the sea.

THE SITUATION:

A sudden and dramatic earthquake will strike your area in about six weeks. You and your family and all the people you know will survive, but all the grocery stores will be destroyed. Completely. Not even one Cheerio or soda will remain. The airport runways will be gone, too. Perhaps the boats will bring supplies before winter comes. Perhaps not. In the meantime, you will need to gather food from plants. Others will be responsible for gathering food from the sea. How will you find your food? Where will you find your food? How will you prepare it? Store it? Are there plants for medicine in the area?

You are fortunate to have time now to plan and prepare. In a few short weeks, you can learn a great deal about nature's store. Probably you will need help from Elders and mentors and other experts. But first you need to discover what you already know about plants.

What if all the grocery stores and other modern conveniences disappeared tomorrow?

SAAHMIKAADAĀ

Chiqim quganaalgîgigan qakagan ilan adas. Qayas kangan liisnadaġulas, sakang atim hadan agach azas.

Siġlingis hasinal txidix suġtazas. Siġlingis iġiġidal adukus, ataqaŋ siġliġ atġuġ aduutaakadaġ. Ukuġaa hakaġinaġ liidal chutxidigal hangaġtazaġ. Chuniġiim chuġigal ilagaan iladix axtal hangaġtal hakaġaġtazas.

Kangan talġis akus talġiġ aahmaaġim quhmagan siinimluzangis matazaġ. Talġis alalakaġ mal, aahmaaġii angunazaġ.

Siġligal chidġingis aamġiġ atxidaġ. Siisġil al kay chaġugnaġ matanas ngaan suġazaqas.

Siġligal qutangis unalgal uġungis anġaġinam aamġiġ qingdusanagan ngaan taangaġtachġisxazaqaġ.

Written by Nadesta Golley
 "Atġam Hitnisangis/Atkan Plants"
 Page 42
Niiġuġiġ dialect (Atka), in short form *Niiġuġ*



× 1/3
Achillea borealis
 Chngaatudaġ E (UT 148)
 Saahmikaadaġ W (UT 351)
 (hairy, shaggy)
 Northern yarrow

They are found in gravelly dry ground areas. They are hardly found on tops of hills. They like growing down in the low-lying areas. The leaves are all bunched up and look crowded. The leaves are thin and long. One leaf is as long as a finger. It looks like it is feathery, grows sharply and tapers off at the top. On top of the plant are branches with white flowers that look seedy as they grow on top of the plant. There at the top are lots of branches and the flower grows big. The green leaves are used for stopping blood. The plant was used for people with nosebleeds and for cuts to stop the bleeding. The leaves are dried and boiled in water and the juice was used for people to drink, those who spit up blood.

Translation by Moses L. Dirks

What do you know about plants?

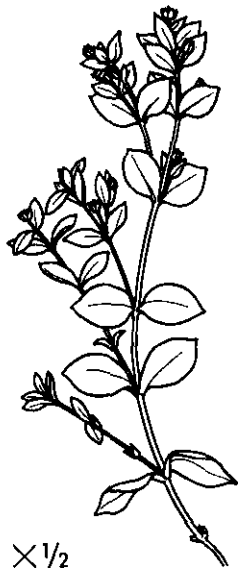
ACTIVITY ONE. You can make a log book to record your work on plants.

Later, you will make a cover for the book. Scientists usually record their daily work and their experiment notations in a log book. The log book helps them understand the changes they may need to make in future work and gives them accurate records to compare with when continuing experiments. You can be a scientist, too, while you are learning about plants for subsistence and survival.

ACTIVITY TWO. You can discover what you already know about plants.

Go outside with your class. Form a circle with your teacher and look at all the plants growing in that circle.

1. Ask yourself:
 - A. What plants do I know about already? What are the names of the plants? Do I know *Unangam tunuu* (say oo NUNG um too noo) and/or scientific names and/or English names for the plants?



× 1/2
Honckenya peploides
Isuġim anungim E
 (UT 77)
 (hair seal's lupine root)
 Beach greens, scurvy
 grass, seabeach
 sandwort

- B. If I have gathered these plants before, where was I? When did I gather? Who was with me?
- C. How could we use the plants? Food? Medicine? Baskets? Other objects?
- D. What plants do I know I should avoid?

E. What do the plants look like? I can sketch a picture of the plant(s).

2. When you return to the classroom, write in your log book. Tell what you already know about the plants. Use the topics above to help you remember.
3. Then write a paragraph in your log book: "This is what I want to know about plants."
4. With your fellow students, write a class record that puts all of your individual writings together. Choose a recorder to write what each student says on large pieces of paper that you can all see.

Label one piece of paper:
 "What we want to know."
 Label another one:
 "What we know already."
 (and write the name of the student who already knows about that plant.)

When you have discovered what you do not yet know, it will be time to prepare to call upon your Elders, and other experts.

You can learn about leaves.

While it is the flowers that most readily capture our attention in the plant world, the flowering season is, alas, quite brief. Leaves, on the other hand, are visible and prominent in most plants throughout the entire growing season. They may, in many instances, provide the sole clues to a plant's identity. Thus, we begin with the leaves as we focus our observations on the plants of the Aleutian/Pribilof Islands.

If, however, you are working on this unit when the plants are in full flower, then your teacher may direct you to fast-forward to the "Flowers" section so that

you capture the plants in full bloom. You may return to this section later.

ACTIVITY THREE. You can be a wise plant collector and learn about leaves.

1. Discuss the principles of collecting and using plants wisely.
2. Go outside with the teacher to a location near the school. You will need to be able to return to that location later in the class period, so the teacher will choose a place nearby. Collect 5 different-looking leaves, preferably from some that are already on the ground.

- Choose leaves that look healthy. Select leaves that are still green or that have not dried out. When possible, take leaves that have already fallen off the plants. "Take care of the land and the waters."
- If you need to pick leaves from a live plant, pick only one leaf from a plant, and not the whole plant. You want to keep the plant alive to do its important work. Be sure not to collect in an area traditionally harvested by others. "Don't do anything to excess."

- Select just a few leaves. You only need 5 different ones. "Don't be greedy."

3. Come back into the classroom and look at the leaves. Beginning with one student's collection, talk about the following questions:

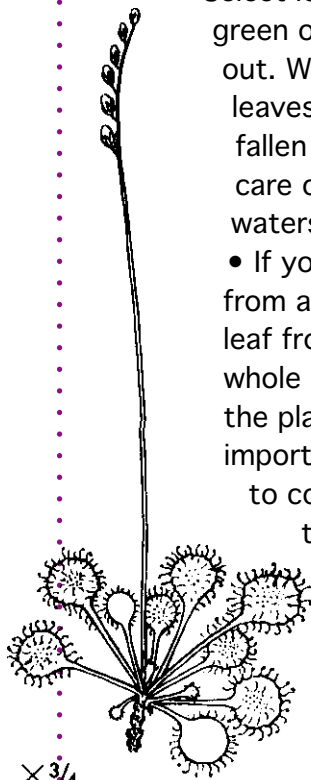
- What do the leaves have in common? Are they the same in any way? How are they different?
- What do the leaves feel like? Are the leaves hairy? Smooth? Sticky? Thick? Thin?
- Do the leaves have a scent?
- How are the edges (**margins**) of the leaves shaped?
- Which leaf is the biggest? Smallest? Longest?
- Are the leaves all the same color? How are they different?
- What designs are on the leaves? Can you see the **veins**? Hold the leaf up to the light to see the pattern of the veins.
- Have insects eaten on any of these leaves? How do you know?

Continue with 2 or 3 more student collections.

ACTIVITY FOUR. You can describe leaves.

1. Divide into teams of 3 or 4 individuals. Look at all the leaves your team collected. How will you group them? List the qualities in each leaf group. Select one student in your team to be a spokesperson and explain the leaf groups to the rest of the class.

2. Each person in your team needs to select one leaf from the group. You do not need to choose a leaf that you personally collected. Go outside with your log book, the leaf, and a "Leaf Arrangement" card. Try to find the kind of plant the leaf came from. When you find it, look carefully at the ways the leaves attach to the plant. Using the leaf arrangement card, determine how the leaves are arranged on the stem. How does the leaf connect to the stem? Are there many leaves on the stem? What pattern do the leaves make: **opposite, whorled, alternate**? Are they



Drosera rotundifolia
Sundew

Don't touch the leaves if you are a bug! The sundew has some of the most amazing leaves in the plant kingdom. Its sticky leaves will catch insects. When the insect is stuck, the leaf curls up, trapping the insect inside to make itself a meal!

SECTION ONE

at the top of the stem? Or are they at the bottom, **basal**? Record what your observations (use observation words, not opinion words) in your log book.

3. Put the leaves in a flower press before leaving school.

ACTIVITY FIVE. You can "Pick a Place" to write about.

Twice a month during the school year, you will be visiting a personal place for 15-20 minutes. Your personal place should be approximately 9.8 feet (3 X 3 meters) in size. During your visit you will write what you observe there, or take photographs, or draw pictures of objects. When you go home today, go outdoors with your parents or caregivers and choose a special place in the yard or in a nearby area that will become your personal place. Tonight,

you should write one paragraph describing your place.

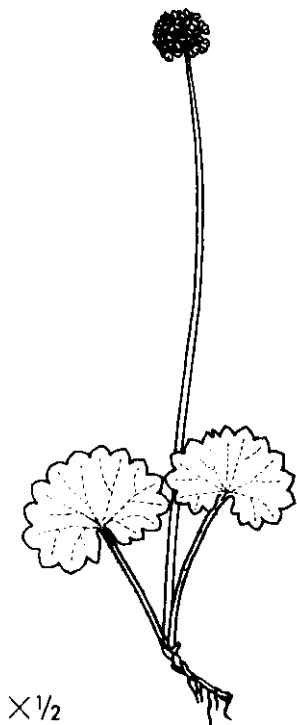
ACTIVITY SIX. You can use your collected dried leaves to make a cover for your log book.

Cut pieces of manila file folder and contact paper or laminating film to match the size of your log book. Do one of the following (or explore with your own technique for using the pressed leaves on your log book cover):

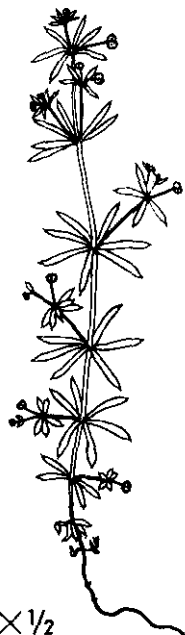
A. Place the leaves between several layers of newspaper with heavy books on top for 3-4 days. Then arrange the leaves on a page cut from a manila file folder. Write each leaf's descriptive words beside it. Cover the leaves and manila paper with a layer of contact paper.

OR

B. Place the leaves with layers of paper towel on the bottom and a layer of wax



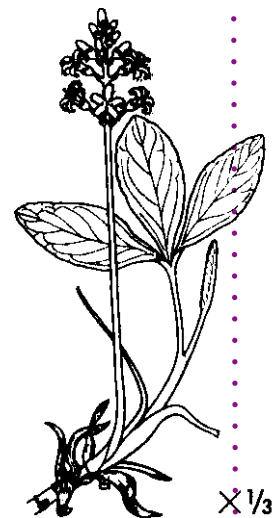
Saxifraga punctata
(= *S. nelsonia* D. Don)
Cordate-leaved saxifrage,
brook saxifrage
Leaves are palmate,
toothed, and basal.



Galium aparine
Bedstraw
Leaves are
whorled,
smooth.



Artemisia unalaskensis
Sixsiqaḵ (UT 358)
Wormwood
Leaves are lobed,
alternating.



Menyanthes trifoliata
Buckbean, bogbean
Leaves are pinnate,
smooth.

Vocabulary

For words in *Unangam tunuu*, E = Eastern dialect and W = Western dialect. If no designation is noted, the words are familiar in both.

aġada✕ E (UT 36) (uh RUH thuh): sun

aġadgi✕ W (UT 36) (uh RUHTHE gegh): sun

chidġi✕ E (UT 135) (CHIDTHE gegh): green

chidġaayu✕ W (UT 135) (chidthe GUY yoh): green

chidġaayu✕ E (UT 135) (chidthe GUY yoh): blue

chidġi✕ W (UT 135) (CHIDTHE gegh): blue

chiġta✕ (UT 138) (CHIH tah): rain

chumnugim qaxchikluu E (Dirks, 1992)

(chum NUH gim • kagh chik LOO): brown

chumnugim qa(x)chikdaa W (Dirks, 2001)

(chum NUH gim • kah CHIK thaah): brown

hitnisangin E (UT 216) (hit nee SUNG in): plants

hitnisangis W (UT 216) (hit nee SUNG is): plants

ini✕ E (UT 201) (iH nyih): sky

inka✕ W (UT 202) (iN kah): sky

inkamaaġu✕ E (UT 202) (in kah MAAH roh): cloud

inkamiġu✕ W (UT 202) (in kah MEEH roh): cloud

qaxchiklu✕ E (UT 296) (kahk CHIK loh): black

qaxchikda✕ W (UT 296) (kahk CHIK thah): black

quumhlaakda✕ E (UT 336) (koom HLOCK thah): gray, silvery

quuhmliix W (Dirks, 2001) (koom LEEH): gray

yuli✕ E (UT 465) (YOO legh): leaf

siġli✕ W (UT 359) (SIHGH legh): leaf

taanga✕ (UT 292) (TAAHN gah): water

alternate

basal

compound

lobed

margins

opposite

palmate

parallel

pinnate

smooth or entire

toothed

veins

whorled

SECTION ONE

paper on the top. Press with an iron on low heat for a minute. See if the plant is fairly dry. Press again. Then arrange as in A above.

OR

C. Press your leaves. Using the school laminator, arrange your leaves on laminating film. Write each leaf's descriptive words beside it on small pieces of paper, and secure the specimen and the words with the laminator.

OR

D. Use a microwave plant drying method to quickly press your leaves. Then arrange them as in A, B, or C above.

ACTIVITY SEVEN. You can show what you know about leaves.

Complete the Leaf work sheet.

ACTIVITY EIGHT. You can learn about traditional ways to preserve and use leaves.

Prepare 4 questions that you would like to ask an Elder or expert about collecting, caring for, preserving and using leaves. As soon as you have the opportunity to interview an Elder or expert, ask these questions and record their responses in the log book.

EXTENSIONS

ACTIVITY A.:

With a partner, sort the Plant Illustration Cards into groups with similar leaves in each group. List the reasons why you have made these groups.

ACTIVITY B.

Leaf classification at GLOBE site: "[http://globe.fsl.noaa.gov/sda-bin/wt/ghp/tg+L\(en\)+P\(landcover/LeafClassification\)](http://globe.fsl.noaa.gov/sda-bin/wt/ghp/tg+L(en)+P(landcover/LeafClassification))"

To think about: Why do you suppose leaves are different sizes and shapes?

"We always had a string behind the wood and coal stove where plants were drying to last until spring. Then we put them in the attic to store. Upstairs was always warm and dry, and it always smelled good in our house. I never knew what perfume was when I was a girl."

Mary Bourdukofsky,
Unangan Elder from St. Paul

Student Assessment, ONE	Name: _____			
Date:		1. Always	2. Sometimes	3. Never
I stayed on task.				
I completed my work.				
I asked questions.				
I worked cooperatively with my class members.				
I was respectful of values.				
I was respectful of others.				

ACTIVITY SEVEN

Leaf work sheet

Name _____

Draw a line from the word to the picture:

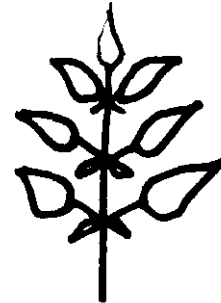
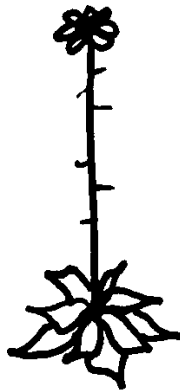
a. Toothed leaf

b. Parallel veins

c. Opposite leaves

d. Whorled leaves

e. Basal leaves



f. When the indentations on the leaf margin are deeply cut, they are _____.

g. When the leaf margin is not cut, it is _____ or _____.

h. When the leaf's veins come from a point near the base and fan out, they are _____.

i. Leaves arranged one above the other on opposite sides of the stem are _____.

j. An *Unangam tunuu* word for leaf is: _____ or _____.

ACTIVITY SEVEN

Leaf work sheet Answer Key

Draw a line from the word to the picture:

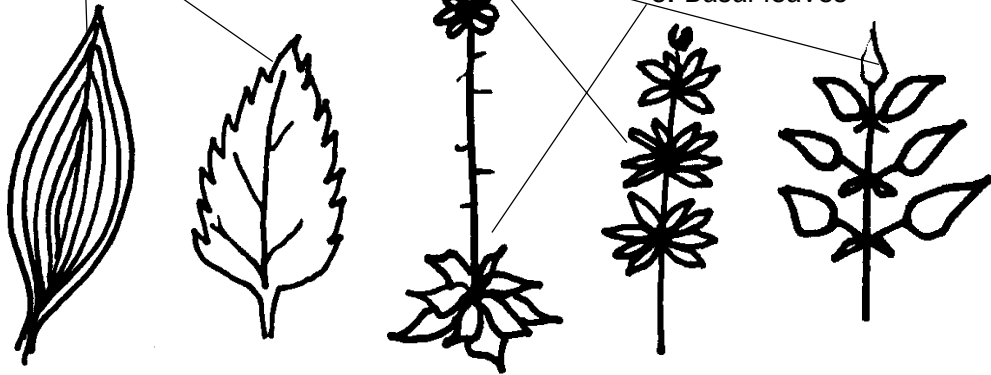
a. Toothed leaf

b. Parallel veins

c. Opposite leaves

d. Whorled leaves

e. Basal leaves



f. When the indentations on the leaf margin are deeply cut, they are lobed .

g. When the leaf margin is not cut, it is smooth or entire .

h. When the leaf's veins come from a point near the base and fan out, they are palmate .

i. Leaves arranged one above the other on opposite sides of the stem are alternate .

j. An *Unangam tunuu* word for leaf is: yuliġ (E) or siġliġ (W) .

NOTES: