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Unangam Hitnisangin | *Unangam Hitnisangis* | *Aleut Plants*

To the Teacher

Just six weeks from now, an earthquake will happen.

You and your students will survive the earthquake. Indeed, the only disaster in your area will be the complete destruction of all grocery stores. What will you do then? How will you and your students survive? How will you find food? Medicine? Fuel?

Fortunately you have six weeks to prepare (coincidentally the recommended length for this unit of study). With the guidance of Elders and community experts, you and your students can learn about your local plants and how to use them wisely. The Aleutian/Pribilof Islands are home to more than 500 of the half-million plant species in the world. (Hall, Hultén, Burnie) How many of them can you safely eat for food? Use for medicinal purposes? Harvest for fuel, shelter, utilitarian and decorative objects?

Unangam Hitnisangin . . . contains six weeks of culturally-relevant information and standards-based activities for you and your students. It relies on traditions of Elder involvement and guidance. Plan now to invite Elders and/or local experts to share their knowledge with your students several times during this unit of study. The unit contains recommendations for inviting, interviewing, and hosting these honored guests. Plan, too, for a community gathering at the conclusion of your plant study, so that your students may share what they have learned.

As a culturally appropriate study, development of the units has been guided by Elders in conjunction with the Association of *Unangan/Unangas* Educators. A vital element of the unit is learning through *Unangam Tunuu*, the first language of the people.

Intended as an interdisciplinary unit of study, suitable for grades four through six, *Unangam Hitnisangin* . . . provides six weeks of activities that may be expanded, shortened, or selectively used according to the needs of your classes. Early fall or late spring are the most productive times to use *Unangam Hitnisangin* If begun in the fall, *Unangam Hitnisangin* . . . could be studied or repeated in the spring. It is estimated that each daily lesson will require about an hour, but some portions—fieldwork or interviewing—may take longer blocks of time. Completed unit projects include art, experiments, log books, written work, and a Class Herbarium and local plant guide.

Arranged with vocabulary, resources, and notes about meeting Alaska State Standards, the unit is designed for easy placement in a binder or file folder. Each of the topic sections contains special information for the teacher. The section begins with the summary and materials needed for the lesson. Objectives and skills are correlated with Standards. Suggestions for activity implementation and optional activities are included, also. Teacher pages are followed by student background and activity pages. Unit assessment is designed to be used weekly by teachers and students. A variety of embedded assessments are organized in the instructional activities as well.

An important recurring activity in *Unangam Hitnisangin* . . . is the direction to students to write daily in their log books. The log book is a tool used by all scientists to record observations, experiments and data. Writing on a regular basis in the log book provides discipline that will, over time, improve and sharpen writing skills. Students learn to be more discriminating observers and improve their ability to turn their observations into accurate phrases.

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Special Additions:

GLOBE

Schools participating in the GLOBE program can incorporate plant phrenology and land cover survey within this unit. **Global Learning and Observations to Benefit the Environment** maintains a Web page at “<http://globe.fsl.noaa.gov/>” where you can learn more about this exciting program.

Fast Plants

We also recommend that you consider Fast Plants which is a unit of study for elementary and middle school developed by the University of Wisconsin. It uses a rapidly-growing plant, *Brassica rapa*, that has a life cycle of 35-40 days (seed to seed) and can be grown in the classroom under continuous fluorescent light.

As a supplement to this unit or as a winter focus adjunct to this unit, Fast Plants offers your students a dramatic and well-developed study of the full life cycle of plants through an exciting and well-organized series of experiences. More information is available in the appendix and at the Fast Plants Web site, “<http://www.fastplants.org/>”.

Overview

by Barbara Švarný Carlson

As an *Unanga* educator and a person who grew up in Unalaska, the disaster scenario is one I could easily imagine. I recall waking to the sounds of crashing dishes, things falling off shelves with thuds in the dark, and a younger sister crying. I remember vigilant parents hustling us to put on our clothes over our pajamas so that we would have more layers and dress quickly. Then they fed us in the middle of the night so we would not be hungry if we had to head for the hills. Another time, my gentle father sternly swooped me off the beach much to my surprise. I had hurried with my chores to go down to my favorite place in the world—the beach at low tide. I did not know the extremely low tide was connected to an earlier earthquake and that townspeople were watching for a tsunami. Young people will have the chance to learn far more than I have learned in my lifetime about our local plants in this unit. The subject will connect them to this place and extend their curiosity to the worlds of botany, of science, and of technology.

Unangan/Unangas Elders tell us people should know about the survival foods and medicinal plants where they live. In efforts to adapt after contact, we lost some of the usual ways our young people learned these things. In our traditional education youth learned from their Elders, aunts, uncles, and parents. When laws forced the speaking of English and school attendance, relationships that gave the supportive environment for traditional teaching began to disappear. The collaborative writing of new curriculum is indicative of the spirit of reclamation in our decision to resume participation in the education of youth. Truly, to build strong communities we must take collective responsibility for all our young people. If we choose to make our lives in this place, then we have commitments to honor together in raising and educating tomorrow’s citizens.

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Indigenous peoples everywhere are reclaiming, revitalizing and perpetuating their cultures. They are reclaiming their names for themselves such as *Unangan* or *Unangas* in place of Aleut. We realize that while our languages have declined, there is value in them beyond communication. Traditional knowledge is contained in the structure, use and meaning of language. Exposure to elements of *Unangam tunuu* and familiarity with the phonetic sound system will help ready scholars for the rigors of further linguistic endeavors should they so desire. While it is not always feasible to become fluent in a new language, people can choose to learn how to say words and phrases that are commonly used where they live, thus allowing them to adapt and immerse themselves in the beauty, the poetry of a culture.

Learning *Unangam tunuu* is becoming difficult as few villages remain where parents teach it to their young as a first language. Armed with this information we are charged with supporting efforts to maintain existing fluency and exploring alternative ways of preventing further loss. Just as teachers will find different botanical resources in each village, so will there be different levels of Native language usage in each place. Places such as Atka, St. George and St. Paul have a number of youth who speak fluently, while in other places the youngest speakers are over 60. In the year 2000, only Unalaska had a certificated teacher who spoke *Unangam tunuu* as his first language. The majority of students' parents never had the opportunity to learn their own language. Consequently, with this guide a teacher is able to help students, some of whom will be *Unangan/Unangas*, and their peers learn some rudiments of the language or reinforce that to which they are being exposed.

Teachers new to the area should consider beginning slowly by using only the vocabulary within the lessons unless they are self-motivated learners or linguist enthusiasts. Available support will vary in each place. If speakers exist, only a few of those are literate in *Unangam tunuu*. Enthusiastic, energetic teachers will need to become more involved with the sound system, grammar, and etymologies. Use the new standardized spellings provided. A number of older sources contain nonstandard usage, which while historically valuable contributes to confusion. The section titled "*Unangam Tunuu Sound System*" provides a resource list, and the rudiments of the phonetic system. Teachers who encourage students to share language information at home as part of their assignments will likely be rewarded by increased interest and participation. Some of us have never had a chance to learn even a few words, and if we have, most likely have never been introduced to the standardized orthography or spelling.

"How to use the Aleut Dictionary" will be invaluable if you decide to use *The Aleut Dictionary/Unangam Tunudgusii*. The section contains a brief history of the language and the work. It will help you avoid common pitfalls.

The Association of *Unangan/Unangas* Educators (AUE) coordinated this project. AUE is one of nine Alaska Native Educator Associations recently formed to address unique needs. This curriculum is posted on the Alaska Native Knowledge Network at <http://www.ankn.uaf.edu/>. The link for the Alaska Native Knowledge Network will give you an idea of what our networks are undertaking in the interest of integrating our traditional indigenous knowledge into the mainstream education systems and communities before they are lost to the world. While there are constraints to completing the work, the network allows us to benefit from one another's successes, failures, and opportunities.

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Most of our members live not only in different places, but on different islands. We have never been able to all meet face-to-face due to logistics. We are thrilled, however, with the things we are able to accomplish through audio-conference meetings, newsletters, and e-mail communication. Participation of Elders and local experts in your project will greatly enhance learning. Keep in mind that in some places the same resource people are called upon year after year, so it may not be convenient for them to be involved every time. Ask if they can suggest another person or books that they consider useful in the area.

The *Unangam* Elders' Academy decided which of several subjects should be done first. It was a difficult decision because many things are urgent as our tradition bearers pass away at an alarming rate. The decision to focus first on plants was made to reinforce the culture and stewardship camps where young people have been learning from generous mentors about our local plants. Elders instructed us to do this so that students are pulled into the world of science by becoming familiar with local plants associated with their names in *Unangam tunuu* and traditional knowledge. It is a small project, but we hope that by doing one small thing correctly we will see more clearly how to continue to document appropriate ways to share the traditional knowledge of the *Unangan/Unangas*.

The mission of AUE is to support the efforts of *Unangaŋ* educators to integrate traditional knowledge and language into schools in a way that is accurate and long-lasting. Goals: 1) to help tradition bearers of *Unangaŋ* knowledge find ways to participate that are comfortable for them and do not drain their resources and 2) to support educators who endeavor to integrate traditional *Unangaŋ* knowledge and language into schools.

To contact current Association of *Unangan/Unangas* Educators representative, please check the following Web site: <http://www.ankn.uaf.edu/Unangan/>

Overwhelmed?

In discussions that followed the pilot testing, *Unangaŋ* Elder, Gertrude Švarný of Unalaska, made a recommendation. She suggests that if educators feel overwhelmed, either by their workload or the depth of the material itself, that they select one activity to try this year. Then, during following years it will be easier to do more, building upon knowledge gained the first year.

In meetings and directives prior to this project, Elders have told us to use our words in *Unangam tunuu* even if they sometimes forget, having become accustomed to using Russian loan words popularized the last two centuries. It is good policy to always teach the appropriate word in *Unangam tunuu* if one can be found, or they will be forgotten. Elders often use "Aleut" but want to hear us say "*Unangan*" (Eastern) or "*Unangas*" (Western). It is a matter of habit. They might say *bidarka* when they would be delighted for us to use *iqyaŋ*. Most people only know our semi-subterranean sod homes as

Unangaŕ

The time has come to reclaim our name for ourselves. The word we now make known again is “Unangaŕ” Unanga means “seasiders” if you break it down in the language. [see p. 444, *Unangam Tunudgusii/Aleut Dictionary* compiled by Knut Bergsland and published through the Alaska Native Language Center @ UAF.] When outsiders came to these islands they got the mistaken idea that we should all be called Aleuts. Our Elders tell us that their Elders told them that we call ourselves Unangaŕ. There are other words used in some places, but we Native people from all the Aleutian and Pribilof Islands use this word. We are grateful that they saved this knowledge and shared it with us. To honor our ancestors and “teach our children well” we take back our name in place of “Aleut” whenever possible. We might forget sometimes and it might feel awkward but we will all get used to it. When we describe ourselves as Unangaŕ we feel strong, proud and truly know who we are. We invite you to join us and act on it daily.

To use this word right you will need to learn the following slight changes for specific situations:

1. **Unangaŕ (oo NUNG ah)** = 1 of the people who call themselves Seasiders.
Example: Emil is *Unangaŕ* or Emil is an *Unangaŕ*.
Can also mean: the group of people who call themselves Seasiders
Example: The *Unangaŕ* are famous for their seafaring skills.
2. **Unangaŕ (oo NUNG eh)** = 2 of the people who call themselves Seasiders.
Example: The *Unangaŕ*, Pat and Laresa, went berry picking.
3. **Unangan (oo NUNG an)** = 3 or more of the people who call themselves Seasiders in all dialects except Atkan.
Example: Example: In False Pass, Sand Point and Unalaska, the plural of *Unangaŕ* is *Unangan*.
4. **Unangas (oo NUNG us)** = 3 or more of the people who call themselves Seasiders in Atkan.
Example: In *Atŕaŕ*, the plural of *Unangaŕ* is *Unangas*.
5. **Unangam (oo NUNG am)** = the word showing something belongs to us.
Unangam must be followed by the word related to its possession and cannot be used alone as the rest of the above may be used.
Example: *Unangam Tunuu* means *Unangam* Language. Not : They are *Unangam*.

Note: *Unangan* and *Unangas* mean the same thing; they just have different endings.

If this is new to you, use just the word *Unangaŕ* at first. If you do not know what tribe some people are from and you see them holding their baby, you might say, “What a beautiful *Unangaŕ* !” and be absolutely correct.

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barabaras instead of *ulan* (E) or *ulasus* (W). The more we say the words the more the Elders will get to hear them again. They get lonely for someone to talk to in their own language. They long for the sounds of *Unangam tunuu*.

Welcome to this wild and beautiful place. *Qaġaalakuġ*, thank you, for helping us assure that the traditional plant knowledge and language of these islands will be lost neither to ourselves, nor to the world. Thank you for sharing your enthusiasm and excitement about learning. Thank you for choosing to teach here.

What does the color-coding mean?

Unangaġ

None (no colors) for one.

Example: I am an *Unangaġ*.

Unangax

Blue for two.

Example: The *Unangax* of whom we speak are Sally and Crystal.

Unangan

Green for Eastern (*Qawalangin*, etc.) and Attuan (*Sasignan*).

Example: Moses, Iliodor and Barbara are *Unangan*.

Unangas

Red for Western (*Niiġuġ*).

Example: Those three handsome people are *Unangas*.

Unangam

Purple for possessive.

Unangam Ungiikangin (Eastern)/*Unangam Ungiikangis* (Western), in the title of a popular text, means ‘the old stories that belong to the *Unangan/Unangas*.’

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ELDERS AND EXPERTS

Ludakiim axtax samtaaxtxin. E/Ludaaġis, tukusama uchiitilas sahngaġtada. W/Respect Elders (This includes parents, teachers and all people, young and old.)

Because it may take some time to arrange for Elders, experts or mentors to come into the classroom or into the field, you should begin early to plan for your visitors. You should also begin early to plan for the concluding activity, a community celebration where you will share all your work on plants.

Plan carefully for visits from Elders, experts or mentors.

Ask your class who to invite. You may wish to give students a homework assignment to talk with their families or friends to find names of Elders and experts. However, please do not assume that all Elders have expert knowledge of plants. Nor should you assume that an Elder automatically accepts designation as an “expert.” If you have a Native Parent Advisory committee for the school, they might be able to suggest someone who would be good to ask. Ask at the grocery store, the Post Office, the Health Clinic, and your fellow staff members, “Who knows a lot about the plants in this area and might help us at the school?”

Brainstorm with your class how to contact Elders and experts—written invitation, posters, phone calls are some options—and where to conduct the interviews. While it is tempting to ask Elders and experts to walk about and show you information in the outdoors, it may not be always possible to do this in your community. Your Elders and experts may prefer to come into your classroom to share their knowledge with the students. Be flexible about the ways to accommodate this participation. Keeping a positive attitude and listening and watching how things can happen in rural Alaska are keys to success. Things do not always happen on a strict timeline.

After you have arranged for the invitations, take the time to show Elders and experts your interest in and concern for them. Perhaps offer to meet with them for tea before they meet with the students. Find out if they wish to have transportation arranged in order to come to a session with the students. They may also need transportation arranged to participate in the concluding community celebration. If you plan to invite several Elders, explore the possibility of welcoming them as a group and showing them the North Slope video, “Arctic Harvest” (28 minutes). This well-produced video shows Elders on the North Slope collecting, describing, and using their plants. (see Resources Appendix)

Be clear about what help you want.

One possible way to approach Elders and other experts initially is to explain that the students and teachers need some information so that they do not accidentally gather in the wrong place or touch or gather the wrong plants.

Explain that students and the teacher need to understand:

- when to gather;
- how to gather;
- what plant survival foods are important in this place;
- what plants to avoid; and
- where to gather and what places to avoid.

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Take some time to prepare your students.

1. Work with students to develop awareness about courteous and appropriate behavior when they are with class visitors such as Elders. You may wish to construct a role-playing session with one student portraying the Elder and others being the class. What rules of behavior should they observe when they are with an Elder or other experts? These are a few suggestions. Can your class think of others?

- Don't talk when the Elder or expert is talking.
- If you see the Elders doing something, offer to help them.
- Don't interrupt.

As Barbara Švarný Carlson reminds us:

“While it is especially important for the class to behave with courtesy for Elder visits, it is also ‘the right way to live as a human being,’ and should extend to other class visitors. As *Unangan* Elders pointed out, good manners count. Culturally this was especially important to us because we lived in close quarters and when we had to be indoors together, you did not want to get on someone’s nerves and force them to go out in the weather to get away from you. It was a good idea to keep matters civil and to not talk too much so it would bother people (noise pollution).”

2. Brainstorm to develop appropriate interview protocol with your students. There are several resources on the Web that can help. For example, Robby Littlefield’s “Elders in the Classroom,” page 15, *Handbook for Culturally Responsive Science Curriculum*, located on the Alaska Native Knowledge Network site at “<http://www.ankn.uaf.edu/UNITS/index.html>” has a good description of the interview process. See additional suggestions in “Process of Interviewing” at “<http://www.ankn.uaf.edu/interview.html>”.

Karen Yeager from King Cove recommends:

- When interviewing Elders, adhere to the protocol from your local Native Education Association.
- Record bibliographic information at the time of the interview.
- Make sure to arrange transportation for your guests as needed. Provide comfortable surroundings and a beverage to soothe the speaker’s throat.
- If the Elder agrees, have video and audio recording equipment available. You should ask the Elder to sign a release form. (see Appendix for sample form) Practice using the equipment before interviews to insure that you have batteries, cords, film, lighting, etc. Record sound bites for later use.
- If you will record, make sure the location of that activity will be quiet enough to produce a good enough quality recording for the uses you plan.

Caution:

The instructor, Elders, and the local Native Education Association must first approve any information published on the World Wide Web or in other forms. This is particularly important if it appears that the specific information to be published has never before been made available to the general public.

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NOTES on COLLECTING, PRESSING and the CLASS HERBARIUM

A Class Herbarium is the focus of many activities in this curriculum and a major class project throughout the unit of study.

Your Class Herbarium will be a collection of plant specimens from your area and a collection of the plant knowledge from your area's Elders and experts. It will contain all the information that your students have assembled from field collecting and observations, from published field guides, and from interviews. To make the Herbarium, it is essential that your students interview Elders and local experts about plant identification and plant uses. You will need to plan time for those interviews throughout the work weeks. Remember that the information the students collect about the plants will be their "survival" information when the "earthquake" strikes.

There may already be an Herbarium in your school; check with your school library before you begin. If there is an existing Herbarium, you will want to focus on providing additional specimens, updating or adding to information about the plants, or replacing damaged specimens. You may wish to develop a duplicate herbarium to exchange with another school or community.

To make the Herbarium, it is essential that your students interview Elders and local experts about plant identification and plant uses. You will need to plan time for those interviews throughout the work weeks.

What are the steps and principles guiding collecting and harvesting plants? For guidance on local behavior and expectations, you might wish to refer to the values described in "The Right Way to Live as an *Unanga*."

"Take care of the land and the waters."

"Don't do anything to excess."

"Don't be greedy."

Is there a difference between collecting and harvesting? For the purposes of this work with students, you may wish to differentiate between them. Collecting usually means that you find one or two plants that you will take as an example

of all the other plants of its kind. That is your specimen. Harvesting usually means gathering plants in quantity for food, medicine, or objects. Harvesting and subsistence can mean the same thing in many areas. Even though you are learning about local plants so that you can use them, activities in this Unit are for the purpose of collecting specimens for identification and *not eating them or using them for medicine*. That should only happen at the discretion of parents or caregivers.

The most important step you can take to learn about your area's plants will be to consult with your Elders and local experts for information about your specific location. For general information, the following resources are helpful.

These techniques of "traditional conservation" are adapted from the Web site, "Medicinal Plants of the Kodiak Alutiiq Archipelago" at: "<http://www.ankn.uaf.edu/UNITS/medplants.html>":

- Learn the place and conditions under which each plant flourishes.
- Know where each plant can be abundantly found.
- Take time to ask Native Elders if the locale where you are planning to collect is not already a harvesting spot for people.

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- If the plant seems not abundant in the area where it is found, wait to harvest until it can be found growing abundantly. If some harvesting is possible, then take only a few plants.
- Leave the roots of perennials intact, along with a portion of the leaves so the plant can regenerate. When you do take a root, Janice Schofield in *Discovering Wild Plants* recommends taking no more than one out of ten roots. If you take a whole root from a plant such as *Fritillaria*, you can put one of the little bulbs back into the hole you dug. (p. 323)
- Take only what can be processed and used.
- Enjoy the process and appreciate the surroundings. Schofield recommends “Sit and meditate with plants. Plants teach you a great deal about themselves.” (P. 322)

Another good resource to guide collecting is *Alaska’s Wilderness Medicines: Healthful Plants of the Far North* by Eleanor Viereck.

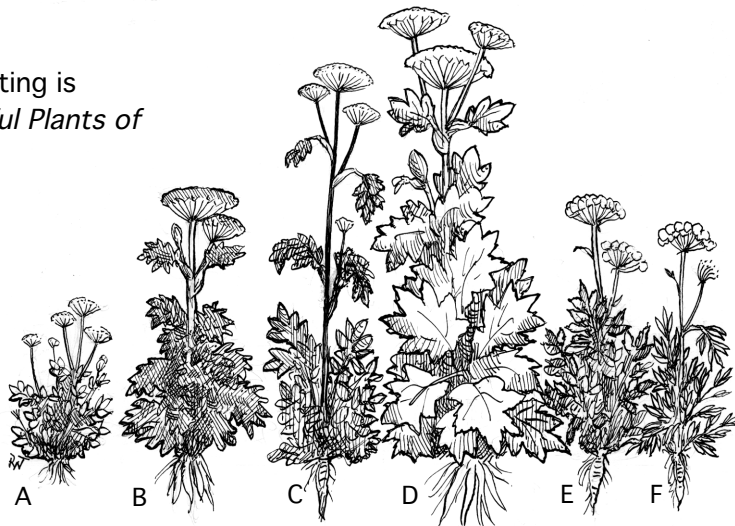
Look on page two, or at the ANKN website, “<http://www.ankn.uaf.edu/viereck/viereckcollect.html>” for her collecting suggestions and cautions.

WHERE TO COLLECT:

Elders and local experts can give you important advice about **where** to collect.

Collect and harvest only in clean areas. Stay away from roads and sprayed places. Be aware of potentially polluted areas such as old tannery locations, power plants, old oil spills, former military sites. Watch out for other vestiges of World War II such as obscured fox holes, barbed wire, and spikes. In some communities you will want to go away from the school if there has been a lot of modernization such as lawn planting or gravel paving.

You will need to get a permit to go on “Village Corporation Lands,” which are most of the lands in some places. Call the village corporation and ask. When permission is granted, you may be given a card to carry with you. This is to prevent damage from vandalism, shooting, poaching, or driving over tundra with 4-wheelers.



Illustrated here, several members of the parsley family. Not all of these plants will be found in your region. Some of these plants are toxic, even deadly. However, some of these plants are well-regarded subsistence and survival foods. Be certain of the plant’s identity. Handling *Heracleum lanatum*, can cause severe skin rashes at some times of the year. *Cicuta Douglasii* and *c. mackenzieana* are deadly. (Open chambers in the roots are an important identifying signal.). For comparison:

- A. *Ligusticum scoticum*; *Qanisan*, *Petruuskaʁ*, *Pitruuskin*, *Petruski* [r]
- B. *Angelica lucida*; *Saaqudiigamax* E, *Saaqudaʁ* W, *St. Paul Putchki* [r]
- C. *Angelica genuflexa*
- D. *Heracleum lanatum*; *Saaqudaʁ* E, *Taaʁan 'giʁ* W, *Putchki* [r]
- E. *Cicuta Douglasii*
- F. *Cicuta mackenzieana*

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You may wish to select an area that you can use as a habitat in several lessons. These areas should contain flowering plants from representative habitats of beach, bog, meadow, sheltered valley, and exposed mountain.

WHAT TO COLLECT:

Elders and local experts can give you important advice about **what** to collect.

All plant experts caution you:

Be certain of the plant's identity! If in doubt, don't harvest. When a plant is in flower, it is easiest to identify. Some plants may be harmful to touch. Others contain toxic substances that can make you sick when ingested. A few are even deadly. Listening to local experts and keeping thorough notes are important. In some locations a plant may be poisonous because of minerals absorbed from the soil, but in other areas, it is considered edible. Some plants are more toxic at some times of the year.

Collect the entire plant. Include the stem and attached leaves, as well as roots. If the plant is in seed, collect those also.

Collect typical plants, not the largest or the smallest. Collect parts that show the full range of a plant's characteristics.

Collect duplicate specimens. One specimen will be labeled for the Class Herbarium and one can be left blank for further identifying and assessment activities. If you cannot identify a plant from the field guides and the advice of Elders and experts, then you may wish to send your duplicate specimen to a plant expert at the University of Alaska or some other location for identification.

Recommended guides for plant identification are listed in the Resources Appendix.

HOW TO COLLECT

A really good specimen is impossible to make from a wilted plant. If possible, collect your plants in dry weather. Wet plants take longer to press and dry, and may mold.

Unless the material is unusually fragile, collect your plants in plastic bags. Use zip-loc bags (gallon size or larger) or plastic waste basket bags with twisties. It is preferable to use bags larger than the specimens you are collecting. Place the plant parts for one kind of plant firmly but carefully in each plastic bag. Close the bag with air inside to make a protective buffer for the specimen as you carry it back to the class room.

Record a specimen identification on the bag with a waterproof marking pen, using the collector's initials and a collection number. Usually the collection numbers are in sequence in the order collected. Each collector records the same number in his/her log book along with details about location, size, date collected, aroma, color and texture. Include the plant name, if known. If accompanied by Elders or experts, record all their shared information as well.

PRESSING PLANTS:

Pressing is a method of preserving plants and flowers that has long been used by scientists. During the summer of 2000, a specimen of the plant *Rhododendron camtschaticum*, which was

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collected almost 200 years ago in Unalaska, was exhibited at the Anchorage Museum of History and Art. It still had its bright magenta color and all its parts looked whole and fresh. With care, your specimens will also last for decades, perhaps for 200 years.

Put the plant in the press as soon as possible. Generally, the faster a plant dries, the better its color is preserved.

Don't press bulky parts such as woody stems or seeds. Attach parts such as these in plastic bags to the final specimen page.

Carefully arrange the plant parts so that they do not overlap or touch one another. Place plant parts so that they are as flat as possible. If you are drying a plant with thick parts or complex flower heads, you may wish to take the plant apart with tweezers, fine scissors, or an x-acto knife so that you can lay the plant flat. A large plant can be folded in a Z or W or N shape to fit your page.

Be sure none of the plant hangs outside the pressing paper.

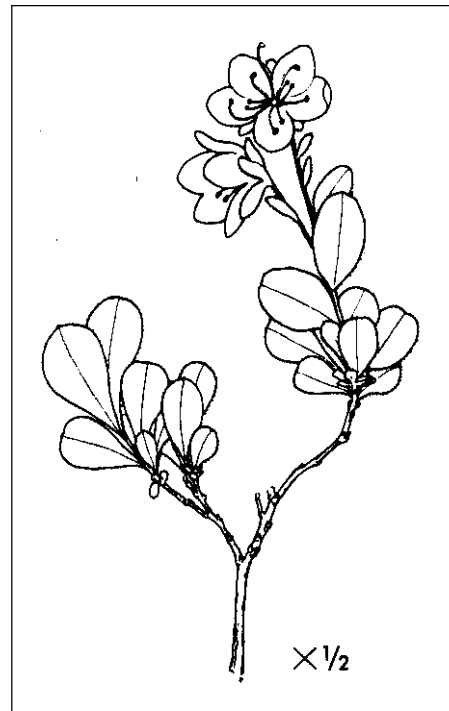
Record the collection number and collector's initials with the plant. You may write directly on the smooth layer or lay a small piece of paper or other identifying tag with the plant.

Depending on how much moisture your specimens hold, it will take one-to-two weeks to press a plant. You can shorten the time by combining traditional pressing and microwave methods as described below.

You can make a plant press.

A plant press is like a giant sandwich and usually has these parts:

- smooth absorbent layer placed next to the plant. The best separator is blotting paper. Blank newsprint can be substituted when used in many layers and changed daily. Any paper that bleeds ink well works because it will absorb the plant's moisture. This is the layer that directly touches the plants.
- Separators that absorb water and allow air to circulate, usually paper pages to put under, on and between the layers of plants. Typically this is a stack of pages about 1/8 to 1/4 inch thick. Newspaper can be used, but be sure your newspaper does not rub ink on the specimens. When drying several specimens simultaneously, divide them with sheets of corrugated cardboard.
- Stiff outer covers such as boards, large books. They make a stiff "sandwich" around the paper and specimens.
- Weights or tension devices. You can stack books on top to weight down the plants. You can



Rhododendron camtschaticum
Kamchatka rhododendron,
moss rose

Plan ahead for compatible page sizes. If you propose to have your Class Herbarium pages be 11.5 X 16.5 inches, the standard size in North America, then set up your flower press also at that size. If smaller page sizes are more appropriate for your class, then prepare the press and the Herbarium pages in comparable sizes.

use rocks, or stone or concrete slabs. You can put two or more C clamps around a pair of boards. You can drill holes in the four corners of rectangular boards and insert long screws with wing nuts to adjust the tension.

You can press plants using your microwave.

This method works like other plant presses and will save you several days of drying time. You may also combine this method with traditional plant pressing, using your microwave for the beginning drying and

then finishing with your traditional plant press methods.

Like most plant presses, the microwave press is a “sandwich” of materials that extracts the moisture from plants while putting pressure on the plants so that they remain smooth.

YOU WILL NEED (for each microwave press):

- Stiff outer layer: 4 pieces of sturdy corrugated cardboard (6 inches by 11 inches recommended, or a size to match your intended Class Herbarium). Do not exceed the interior dimensions of your microwave.
- 10 to 12 rubber bands (tension devices)

Adjust the dimensions of the following pressing materials to match the size of your stiff outer layer:

- smooth layer: cotton cloth such as pillowcase fabric—4 pieces cut to the size of the cardboard cover. (alternates: ink-free newsprint —12 or more pieces; blotting paper; or other smooth-surfaced materials to place next to the plant parts.) Cotton cloth is recommended because it contrasts with the newspaper layer when you are unstacking and checking the press, and the flower parts peel easily from the cotton cloth.
- moisture-absorbing layer such as newspaper—2 stacks, each about 1/8 to 1/4 inch thick and cut to the size of the cardboard cover (alternates: felt; old thick wool blankets; or other moisture absorbing materials to place next to the smooth layers of the press)
- Optional: tweezers, fine scissors, x-acto knife

MICROWAVE CAUTIONS:

Use no metal parts.

Do not look into the microwave while it is on—a recommendation from eye-care specialists.

Time your microwave carefully. You will work with settings timed for a few seconds. If your microwave cannot control by seconds, use a watch and turn the oven off manually. Watch for any signs of scorching or browning on your papers or cardboard. Be sure the press cools and dries between energy bursts. If any scorching or browning happens to your press pieces, replace the pieces with new ones.

INTRODUCTION

Unangam Hitnisangin/Unangam Hitnisangis/Aleut Plants

Directions:

Some plants and plant parts will press better than others using this method. You may wish to test-press your plant if you have enough specimens. Generally, put only one kind of plant part or one kind of plant in the press at a time.

SET UP THE MICROWAVE PRESS

1. Lay down 2 cardboard pieces.
2. Place a 1/8 to 1/4 inch stack of newsprint on the cardboard.
3. Place the smooth layer—2 pieces of cotton cloth recommended—on the newsprint.
4. Carefully arrange the plant parts.
5. Place another smooth layer on top of the plant parts.
6. Stack another 1/8 to 1/4 inch stack of newsprint on the cotton (smooth layer).
7. Cover the newsprint with the remaining 2 pieces of cardboard.
8. Fasten the entire stack with rubber bands, twisting and doubling the bands where necessary to make as tight a stack as possible. Hold the press carefully when you put on the rubber bands so that the plant parts do not shift around.

DRY PLANTS with SEVERAL SHORT ENERGY BURSTS:

The time will vary depending on your microwave. Higher watt ovens take less time; lower watt ovens take more time. Each subsequent energy burst is shorter than the preceding ones:

1. 30 to 40 seconds on high to begin.
Open press for a minute or so to let pieces dry slightly.
Check plant and press pieces. Replace newsprint if wet, wrinkled or scorched.

A plant press is like a giant sandwich

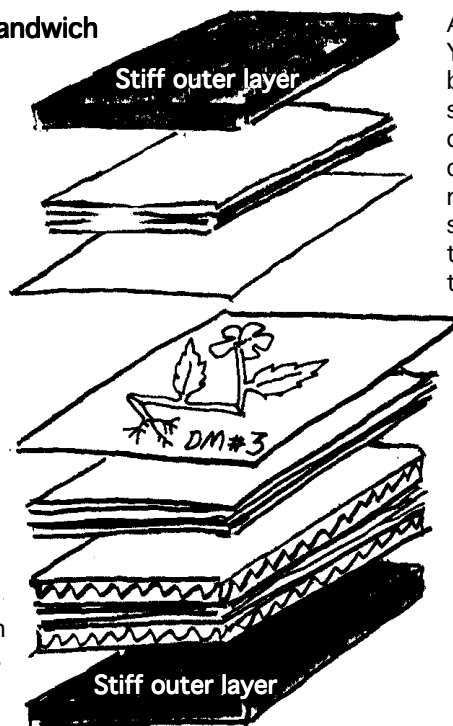
Separators that absorb water and allow air to circulate.

Smooth absorbent layer placed over the plant.

Smooth absorbent layer under the plant.

Separators that absorb water and allow air to circulate.

When drying several specimens simultaneously, divide them with sheets of corrugated cardboard.



Add weights or tension devices. You can weight down the press with books, rocks, or stone or concrete slabs. You can use two or more C clamps around a pair of boards. You can drill holes in the four corners of rectangular boards and insert long screws with wing nuts to adjust the tension. In the microwave press, tension is held with rubber bands.

Plant with long stem folded to fit. Note collector's initials and the collection number matching the log book record.

In the microwave press, the stiff outer layer is corrugated cardboard.

Unangam Hitnisangin/Unangam Hitnisangis/Aleut Plants

2. 15 to 20 seconds on high, next.
 - Open press for a minute or so or so to let pieces dry slightly.
 - Check plant for dryness (see test below).
 - Check press pieces. Replace newsprint if wet, wrinkled or scorched.
3. 10 to 15 seconds on high to finish.
 - Open press and check plant.

TEST FOR DRYNESS. When cool, gently touch the plant parts between your fingers. The plant should feel like dry paper when touched. Thick plants may take longer to dry. Repeat with one or more short energy bursts, if necessary.

If your plant still seems damp, or if you are not certain that it is dry, you may want to continue pressing the plant under books or in a traditional press for a day or so. Remove the rubber bands before continuing with the traditional press.

When fully dried, it will be time to mount the specimens.

MOUNTING SPECIMENS FOR THE CLASS HERBARIUM:

Use heavy, white acid-free paper with one-hundred-percent rag content, but if not available, use any stiff white paper. The standard herbarium size in North America is about 11.5 X 16.5 inches, but smaller paper sizes may be used for your Class Herbarium. With a very large plant, certain representative parts can be selected and arranged on the specimen page.

Specimens should be arranged on the mounting paper before being glued and laminated. Mount only one specimen to a sheet. Leaves are best seen with some leaves mounted on one side and some on the other side. Labels are mounted on the lower right-hand area or, if the specimen is too large, on the reverse side. Because you will be laminating your pages, you will probably not need to also glue the specimens. If, however, you do need to glue the specimens, Elmer's white glue is recommended. Spread the glue on a piece of glass or plastic with a paint brush until it is evenly distributed. Carefully place the specimen on the glue with tweezers and then gently lift the specimen and place it on the mounting paper. Wait 24 hours for the glue to dry before laminating or stacking the specimen.

Most professional herbarium do not have laminated pages, but your class herbarium will be subject to handling and pages should be laminated after specimens have completely dried to protect the specimens during use by students and the community. The lamination will also protect your specimens from insect pests, one of the most destructive threats to the Herbarium. You may laminate with school equipment or with clear contact paper. Position the laminating sheet carefully and avoid any air gaps or bubbles.

Completed herbarium are assembled and stored in various forms. Many are stacked sets of specimen pages in boxes and files. Your Class Herbarium will be an important contribution to your community's knowledge, and you may wish to have students design and build a cover or special box to hold and protect the Herbarium pages.

NOTES: