

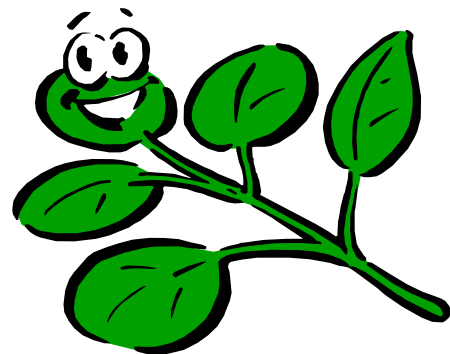


## Topic: Fresh Greens in the Home

### Simple Fresh Organic Greens Every Day

Grade 5-Adult

An integrated lesson plan covering three sessions of approximately one hour each, plus growing time.



### Lesson-Planning Approach

Some learners perceive their "world" as a whole, where all things are interconnected and dependent upon each other. These "integrated" students face major challenges in coping with our dominant educational, social, and economic systems, which tend to present information in a linear fashion without the necessity of integration into meaningful context. Integrated students are at-risk of failing as they attempt to grasp information in ways that do not match their experience. Among large populations of at-risk students are many from Native American and similar cultures who do not regard their world as a sum of parts but as a blend of all that they experience.

This lesson plan does include some traditional, linear approaches to delivering information (checklists, rules, analysis, problem solving and organization). In addition to the traditional, linear delivery of information, this lesson plan also includes some of the following strategies, designed to appeal to at-risk students as they learn academic/life skills:

- ❖ Integration of technology
- ❖ Story telling/anecdotal information
- ❖ Non-competitive group and team work
- ❖ Performance-based assessment and rubrics
- ❖ Visual presentations and practice through technology and other means
- ❖ Project-based assignments that integrate family and community
- ❖ Activities appealing to multiple intelligences (Gardner)
- ❖ Application of Scientific Method to formulate and solve a problem.

### Lesson Overview

This lesson is designed to familiarize students with the nutritional benefits of eating fresh greens and the positive influence of planting and growing in daily life. Easy methods for starting and growing fresh sprouts and greens in containers are applied. Students research various plant, seed, and container choices, obtain necessary supplies, maintain sprouts and container plants, and develop a plant and sprouting maintenance schedule, calendar, or database. Recipes are included to provide an easy way to use the students' produce. Students use a variety of learning styles to study and apply basic horticultural and botanical knowledge, research plant types and nutrition, and use technology to perform internet research.

## Lesson Objectives

### Project: Grow Fresh Greens Indoors

#### Project Objectives: When students complete this session, they will be able to...

- ❖ Grow fresh plant foods to supplement a healthy diet
- ❖ Identify differences between plant and seed types and needs
- ❖ Apply basic gardening and horticultural skills for plant maintenance.
- ❖ Demonstrate knowledge regarding fresh greens by creating a personal database or spreadsheet
- ❖ Apply the scientific method to identify plant needs and solve growing problems
- ❖ Use technology to research information and learn planting and growing methods
- ❖

**Integration of Other Functional/Academic Skills:** (Critical thinking is required throughout the lesson.) Students will be able to...

**Math:** Chart growth and germination rates, comparisons in growth rates between plant types, producing charts illustrating ratios

**Reading:** Read supplied references and web links.

**Writing:** Plan sprouting schedule and /or design container garden, make new recipes

**Science** Observe growth rates, differences, and problems, research solutions, apply plant maintenance methods, communicate results

**Technology:** Develop databases and calendars, use internet for research and reading

## State/National Standards (Complete as Appropriate)

### Reading:

1. Students read and understand a variety of materials.
3. Students write and speak using conventional grammar, usage, sentence structure, punctuation, capitalization, and spelling.
4. Students apply thinking skills to their reading, writing, speaking, listening, and viewing.
5. Students read to locate, select, and make use of relevant information from a variety of media, reference, and technological sources.

### Science:

1. Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.
3. Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.
5. Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.
6. Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.

## Mathematics:

1. Students develop a number sense and use numbers and number relationships in problem-solving situations and communicate reasoning used in solving these problems.
3. Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.
5. Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.
6. Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper and pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.

## Websites

### Required:

[www.extension.iastate.edu/pages/pubs](http://www.extension.iastate.edu/pages/pubs), (Iowa State University Horticulture Guide, Container Vegetable Growing)

[www.ext.vt.edu/department/envirohort/articles2/container.html](http://www.ext.vt.edu/department/envirohort/articles2/container.html) (Four Keys to Successful Container Gardening)

[www.sproutman.com](http://www.sproutman.com) (Sprouting News and Info)

[www.cityfarmer.org/sprout86.html](http://www.cityfarmer.org/sprout86.html)

### Support:

[www.yahoo.com/seedsofchange](http://www.yahoo.com/seedsofchange) (Container Gardening: A Moveable Feast)

[www.rt66.com](http://www.rt66.com) (Southwest School of Botanical Medicine)

[www.drweil.com](http://www.drweil.com) (Dr. Andrew Weil's Health Website)

## Pre-requisites:

Ability to read at a fifth-grade level or above

## Required Materials

- ❖ Assortment of growing containers as required by plant needs and space limitations
- ❖ Assortment of sample sprouts and seeds
- ❖ Appropriate soils or planting mediums as outlined in instructions

## Handouts

- ❖ What To Grow? (Handout One)
- ❖ Data Chart (Handout Two)
- ❖ Easy Native Plants (Handout Three)
- ❖ Sprouts, Greens, and Native Recipes (Handout Four)
- ❖ Lesson Rubric (Handout Five)

## Required Equipment/Technology

- ❖ 1 computer, with Internet connection and a MS Word and MS Access program for every group of 2-3 students

## THE LESSON

**Note:** Students do not learn from what you do but from what you have them do.

### Preparation (Day One: One Hour)

**(Note: The amount of time given for each activity has been estimated, and the activities have been grouped for flexibility and teacher's needs and discretion. Amount of time spent on this lesson will vary due to plant growth rates.)**

Activity	Instructor Notes
1. Discuss nutrition and fresh greens. Why are these important in our diets? How can we include these in our daily lives?	<b>Review the required and suggested web links to become familiar with the nutrition and fresh container greens and sprouts.</b>
2. Read the required web sites.	
3. Examine handouts.	<b>Review handouts with the group</b>
4. Review Powerpoint presentation	<b>Have students assemble the necessary containers for planting. Review power points one and two.</b>

### Presentation (Day Two: One Hour)

1. Purchase a variety of sprouts and/or container vegetables, sample different greens and determine preferences in planting and growing.	<b>Use Handout One as a guide to buying an sampling fresh sprouts and greens. Most health food stores keep a variety of sprouts and greens year-round.</b>
2. After sampling the greens, make a list of the plants and sprouts you will try to grow. If you are choosing container plants, make a drawing of the place where they will be kept and where the containers will be in relation to the windows.	<b>Your class or group can be split into groups according to preferences.</b>
3. Make a chart for care of your seeds and plants (Refer to Handout Two). Design your chart to include checkoffs for waterings, growth rates and measurements, observations on growth, problems and solutions, days until first use, and days to reseed and restart plants.	<b>Review Handout Two. This chart is an example of where to begin. Have the students design their own charts with entry symbols and measurements. Remind the students to make the chart flexible enough to include other categories later. Much of scientific study is learning to accommodate new observations on unknown problems.</b>

### Performance and Practice (Days Three through Finish)

Instructions for students	Teacher notes
1. Begin your planting of selected sprouts and container plants, and mark your first planting day and plant types on your chart	<b>Make sure all containers have sufficient drainage</b>

2. Measure growth with a small metric ruler as seeds germinate	<b>More math can be applied by comparing germination and growth rates between plant species.</b>
3. Enter your chart and rates into a database program and make graphs of information showing growths rates of different plant types, problems encountered, amounts recovered from plantings.	
4. Have group “greens”day, folks try out the recipes here or make new ones, and eat their produce!	<b>You can also use “The Raw Gourmet” by Nomi Shannon, Alive Books, for beautiful recipe ideas.</b>

## Lesson Assessment Strategy (Formative – As the lesson progresses)

### Preparation, Presentation and Overall Implementation (Instructor)

1. Are the instructions and expectations for the class clear from the beginning?
2. Am I spending sufficient time on modeling the skills I want students to acquire?
3. Is there enough variety in the lesson to appeal to most learning preferences?
4. How many learning intelligences am I addressing?
5. Are students “connecting” to lesson objectives? How?
6. How is this lesson “integrated?”

### Performance and Practice (Student)

1. Do all students have the skills to follow instructions? If not, what measures am I taking to address the challenge?
2. Are all students participating in the activities either by active observation or by voicing their thoughts?
3. Am I identifying the strengths of each student and pairing/grouping people accordingly? What results am I getting?
4. How are students performing? Are all of them able meeting 80% of the lesson objectives? If not, what am I doing to help them achieve more?

### Technology

1. Is the technology working?
2. How are students reacting to the technology, and what do I need to remember when I teach this lesson again?
3. How are students applying or wanting to apply their technical skills in other areas?

## Activity Checklist (Handout 2)

Discuss fresh greens and ways of including them.
Read web sites
Examine and discuss handouts.
Review Powerpoint presentation
Sample Sprouts and greens, choose types to plant
Split into groups, make plant lists, design container garden
Make Growth Charts
Plant seeds/begin sprouts, use charts
Maintain plants and measure growth
Design database, enter data, and produce information graphs
Have a greens day

# Handout One: What to Grow?

This is a list of easy to come by seeds and plants to try for sprouting or container growing. You can use this list to sample some of these plants and decide which ones you would like to grow.

<b>Sprouts</b>	<b>Greens</b>	<b>Container Vegetables</b>
Aduki beans	Arugula	Beets
Alfalfa	Buckwheat	Bush beans
Barley	Chard	Bush Cucumber
Broccoli	Lettuce (green or red leaf, bibb, black-seeded simpson)	Bush Squashes
Fenugreek	Mustard greens	Cabbage
Garbanzo	Red-leaf lettuce	Eggplant
Lentil	Spinach	Green Beans
Millet	Watercress	Radish
Mung (common bean sprouts)		Tomatoes
Radish		
Sesame		
Soybean		
Sunflower*		
Sweet pea		

\* Needs soil to sprout. Refer to Powerpoint presentation

# Handout Two: Sample Data Chart

Here is a sample chart that may give you ideas on what information to record about your plants and sprouts, and how to record it. You may come up with symbols to put in the boxes to record waterings and rinsings, measurements (metric is best), days until your first enjoyment, and when to reseed to keep your supply going. From this information, design your computer databases for growth rates and other comparisons you would like to make about the various types of plants and how they grow. Make different charts for sprouts and container greens since you are producing two different kinds of plants. Happy growing!

<b>Day:</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>NOTES</b>
<b>Plant Type:</b>									
<b>Alfalfa</b>									
<b>Mung Beans</b>									
<b>Sunflower</b>									
<b>Broccoli</b>									
<b>Fenugreek</b>									



# Handout Three: Easy Native Plants

## Huntin' and Pickin' Notes

Please be sure of the plant you are picking. If any herb makes you feel queasy or sick to eat or drink, take less of it or none at all.

When picking greens, avoid picking unhealthy looking plants (brown or yellowing leaves, or leaves full of insect holes). Please practice conservation while picking your plants. If there is a large population, never take more than a third. If the total population is small or only a few individuals, check around for a new location.

A small plastic shopping bag (Wal-Mart or grocery store kind) makes gathering fresh greens a snap! Sprinkle a few drops of water in the bottom of the bag to provide humidity and moisture to the leaves until you get them home. This works to keep them quite fresh. Remember not to leave the bag out in the sun or heat. The greens can be stored in the refrigerator or cooler in their bag for up to a day or two until use.

Be aware of where you pick your greens. Avoid plants that are close to highways, roadways, or near areas that are contaminated by vehicles, gas, trash, or many feet, as these plants may have taken up toxins into their tissues.

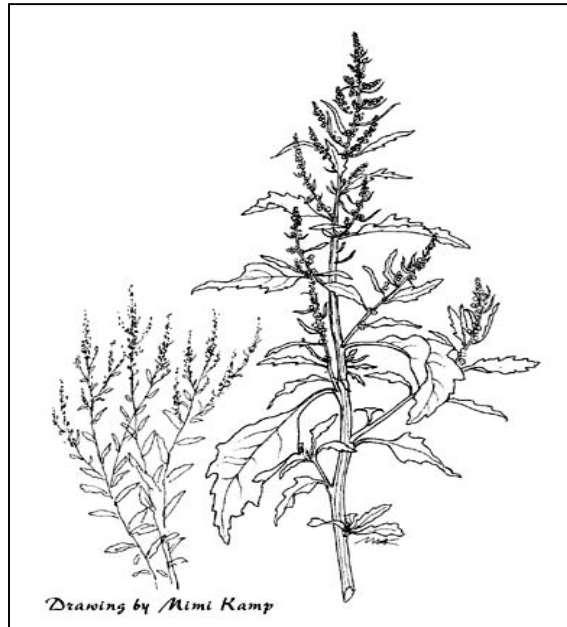
**Dandelion (*Taraxacum* spp.):** What a wonderful source of nutrition and flavor are the common dandelions! They are easy to find and easier to harvest. Dandelion greens are very high in vitamins and minerals. Dandelion leaves have hardly any stems and grow close to the ground, with a milky flower stalk emerging later in the spring. The leaves vary from two to twelve inches long, divided into pairs of lobes and are pointed or blunt at the tips. Flowering occurs up to nine months of the year.



Dandelion greens are some of the first leaves to emerge in the spring, and this is the best time to pick them. They are abundant along streams, moist places, lawns, and disturbed areas. The leaves should be picked very early in the spring, and definitely before the flowering stalk emerges (The leaves in most plants tend to become bitter as the plant flowers). Pick leaves close to the base, store in your gathering bag, then wash and use in a salad or as a potherb in stews.

## Lamb's Quarters/Goosefoot (*Chenopodium* spp.)

Goosefoot (so named because some the leaves have the shape of a goose's or duck's foot) is a wonderful and easy source of nutrition. It is in the same family as our domestic spinach, and has juicy similar-tasting leaves. Goosefoot grows many places, preferring weedy fields, disturbed areas, and moist areas near gardens and ditches. The plants start coming up very early in the spring (a little later than dandelions) and grow quite fast. New plants may also start later in the season as older plants give off seeds. As with dandelions, pick the leaves while the plants are still very young to avoid bitterness. Rinse and use the leaves in salads, soups, and stews.



# Handout Four: Sprouts, Greens, and Native Recipes

## Why Include Raw Greens?

Eating food that is mostly cooked puts a large strain on the body. When we eat, we need enzymes to digest the food. If the food we are eating is raw – whether it is carrots, lettuce leaves, sprouts, or even fish, all the enzymes we need are right there in the food itself, ready to go to work for us. Our bodies do not have to make the enzymes that are already needed in the rest of our bodies. If the food is cooked above 118°F (48°C), these naturally occurring enzymes are killed by the heat.

Enzymes are in the cells of every living plant and animal. It is enzyme activity that accomplishes all biological work from blinking an eye, to lifting a finger, to having a thought. Sprouts and raw foods have a very high amount of available enzymes and nutrients when eaten. Sprouts can be a wonderful addition as a green topping on Navajo tacos, and any green salad. Dandelion, goosefoot, and spinach greens can be added as potherbs to stews or to the ground meat for Navajo Tacos. Here are some selected recipes to use that can boost your intake of fresh greens.

## Navajo Tacos

5 fry breads  
1 pound hamburger or ground mutton  
½ lb cheddar cheese, grated  
Lettuce, spinach, and dandelion greens, chopped  
2 large ripe tomatoes  
1 large can cooked refried beans OR ¼ lb cooked pinto or Anasazi beans

Use your sprouts and chopped greens on top of your tacos or anywhere else you use lettuce.

## Dandelion Salad

Dandelion greens, lettuce, and spinach greens  
Shelled Pinon nuts  
1 small onion, chopped (optional)  
1 carrot, chopped or grated  
Sprouts

Use the greens as a base for the salad, and toss with onion and carrots. Top with pinon nuts and sprouts, and serve plain or with your favorite dressing.

## Mutton Stew with Greens

2 lbs. Mutton, cubed  
4 to 6 cups water  
1 ½ tsp. salt

¼ tsp pepper  
8 small potatoes – sliced  
4 medium carrots – chopped  
4 stalks celery – chopped  
Spinach or dandelion greens

Brown the stew meat. Add water salt, pepper, potatoes and carrots, bring to a boil and cover. Let boil for 10 minutes, then turn the heat down to simmer. Let simmer for 30 minutes, adding water and checking the broth flavor as it cooks. Vegetables should be done.

## **Mutton Meat Loaf with Greens**

2 cups chopped cooked mutton  
1 ½ cups canned tomatoes  
1 cup finely chopped or crushed bread crumbs  
½ chopped onion  
½ tsp salt  
1 stalk celery – chopped  
1 Tbsp green chili  
1 cup spinach greens – finely chopped

Put mutton into a meat grinder, and grind well (if you don't have a meat grinder, the meat department at the local grocery store may be able to help you with this). Steam or lightly boil spinach greens. Mix all ingredients well, and form into a loaf. Place into a bread pan and bake in an oven or horno at 350° for 1 hour.

## **Sprouted Juice Drinks**

Have extra sprouts? Need to use them up quickly? Need a cool lift on a hot day? Try sprouted juice drinks! You can give any juice or smoothie a big nutrition boost by blending them with some sprouts. All you need is a blender and ingredients. Any vegetable or fruit juice can be blended with 1 to 2 cups of sprouts.

1 to 2 cups freshly made juice  
½ to 1 cup sprouts  
dash of lemon juice

For juice, consider pineapple, apple, tomato, carrot, and carrot/celery. For sprouts, try alfalfa, clover, buckwheat, and sunflower or any combination of these.

Soaked sunflower seeds also make a nourishing and tasty milk! After rinsing and draining the seeds, leave the jar inverted on the kitchen counter for three to four hours. Rinse well and remove the skins that come up to the surface. Soak in twice the amount of water as seeds (1 cup seeds to two cups water). You may want to soak the seeds in the refrigerator if it is hot. Soak for at least eight to twelve hours. Rinse and drain again. Blend the seeds with water to taste. You can add dates, raisins, maple syrup, or vanilla to sweeten the drink and add flavor.

# Handout Five: Lesson Rubric

**Adult Education**  
Cortez CO

**Name:**  
**Teacher:** Gloria Edwards/Anne McGinley  
**Date:** Sun. May 19, 2002  
**Course:** Biology

## Indoor Gardening

### Expectations:

<b>Criteria:</b>	<b>Level 3</b>	<b>Level 2</b>	<b>Level 1</b>
<b>Knowledge</b>			
Read and research information from various sources on growing greens in containers. Understands the benefit of fresh greens and container gardening	Fully read and researched information. Fully understands the benefit of fresh greens and container gardening.	Somewhat read and researched information. Moderately understands the benefit of fresh greens and container gardening.	Limited attempt to read and research information. Limited understanding the benefit of fresh greens and container gardening.
<b>Participation/Implementation</b>			
Participated in choosing plants, seeds, and containers. Developed planting and maintenance schedule.	Fully participated in choosing plants, seeds, and containers. Developed thorough planting and maintenance schedule	Moderately participated in choosing plants, seeds, and containers. Developed basic planting and maintenance schedule	Participated in choosing plants, seeds, and containers. Developed limited or no planting and maintenance schedule
<b>Experimenting</b>			
research and plant greens of various types (this should not be evaluated on successful crop yields)	researches and plants greens of various types with thorough comprehension	researches and plants greens of various types with considerable comprehension	researches and plants greens of various types with limited comprehension

Grow container plants or sprouts. Addressed successes and problems, provided solutions to problems.	Grow container plants or sprouts applying all abilities and knowledge . Thoroughly addressed successes and problems, provided solutions to problems.	Grow container plants or sprouts applying some ability and knowledge . Moderately addressed successes and problems, provided some solutions to problems.	Limited attempt to grow container plants or sprouts. Partial or limited concern for successes and problems , provided few solutions to problems.
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