A Curriculum Based on the Importance of Food Gardening

By: Brenda Day and Penny Straub

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Preparation for Bean Plant Comparison Project

Curricular Areas Covered

Science
Botany

Materials

- Planting Soil
- Two types of bean plants
- Large plastic cups
- Water
- Time for Kids article
- Corresponding worksheet

Procedure

1. Students will be divided into pairs
   Each pair will:
2. label one cup "Plant A", and the other "Plant B".
3. pour ½ cup of planting soil into the plastic cup.
4. push one bean plant seed ½ inch below the soil surface in the "Plant A" cup.
5. repeat for "Plant B", using a different bean plant seed.
6. keep the soil moist, without over-watering.

*Make certain that all students plant the same seed type in "Plant A" cup, and "Plant B" cup.

7. With remaining time, student pairs can read *the Time For Kids* article: "Lessons from the Garden" and complete the corresponding worksheet.

Name:_____

Lessons From the Garden

List four **facts** from the article.

1._____

_____

2._____

_____

3._____

_____

4._____

_____

List three **opinions** from the article.

1._____

_____

2._____

_____

3._____

_____

What are some ways you can distinguish between facts and opinions?

_____

_____

_____

Give two cause and effect statements you learned from this article.

1._____

_____

2._____

_____

Give a one-sentence summary on *Ready, Set, Dig.*

_____

_____

Bean Plant Comparison Project

Curricular Areas Addressed:

Math
Ratios
Graphing
Algebra

Science
Measurement
Observation

Materials:

- Plant A
- Plant B
- Measurement tools
- Graph paper
- Corresponding work packet

Procedure

Working in established partner pairs, students will:

1. select a type of measurement for qualitative measurement.
2. select a type of measurement for quantitative measurement.
3. use the appropriate measurement tools to assess both Plant A and Plant B.
4. record quantitative measurements on provided worksheet.
5. compare and contrast qualitative information gathered on provided worksheet.
6. repeat once a week for 4 weeks.
7. analyze gathered data by answering questions on provided worksheet at the conclusion of the project.
8. transplant bean plants into the designated Outdoor Classroom area.

Bean Plant Comparison Project

Group members' names:_____

_____

Bean Plant Comparison Project

Working with your partner, choose one type of qualitative measurement, and one type of quantitative measurement that you will use to analyze your plants.

<u>Qualitative</u>

Bean color

Leaf color

Leaf texture

Fullness of plant

Other: _____(Must have teacher approval)

Bean Plant Reflections

1. Make a graph of the plants' heights and weights. Your teach will give you more information.

2. List the height-weight ratios for the four weeks of the experiment.

Plant A, Week 1:_____ Plant B, Week 1:_____

Plant A, Week 2:_____ Plant B, Week 2: _____

Plant A, Week 3:_____ Plant B, Week 3: _____

Plant A, Week 4:_____ Plant B, Week 4: _____

3. Is there a difference in ratios for Plant A? For Plant B? If so, why do you think this is?

_____

_____

_____

4. Compare your results to another group's data. Do you have similar results? If not, what do you think caused the difference?

_____

_____

5. Do you think any other factors impacted your results?

_____

_____

_____

6. Which plant, A or B, would be best for the Highcrest garden? Why do you think this?

_____

_____

Percentages and Proportions of Orange Vinaigrette*

Curricular Areas Covered

Science	*Mathematics*
Chemistry	Percents
	Proportions

Materials

- 1 teaspoon orange zest
- ½ cup orange juice
- 1 clove garlic – peeled and minced
- 3 tablespoons white vinegar
- 3 tablespoons balsamic vinegar
- ¾ cup olive oil
- ½ teaspoon salt
- ¼ teaspoon pepper
- lettuce
- mixing bowl
- wire whisk

Procedure

Preparing Orange Vinaigrette

1. Combine all ingredients ***except olive oil*** in a mixing bowl.

2. Add olive oil slowly, whisking constantly.

The Math

1. Create a chart that could be used to convert measures given in cups to tablespoons. (Hint: There are 16 tablespoons in one cup).

2. What proportion of the liquid in this recipe is vinegar?

3. What proportion of the liquid in this recipe is oil?

4. What proportion of the liquid in this recipe is orange juice?

5. Make a drawing to show the proportions of oil, vinegar, and orange juice to the total amount of liquid used in this recipe.

6. Now enjoy your creation with the lettuce that you grew in the outdoor garden!

*Adapted from: www.edibleschoolyard.org

The Mathematics of Strawberry Jam*

Curricular Areas Covered

Science
Chemistry

Mathematics
Fractions
Algebra

Materials

- 3 cups strawberries – washed and diced (From the Outdoor Classroom, preferably!)
- ½ cup sugar
- 3 tablespoons water

Procedure

Preparing Strawberry Jam

1. Combine the strawberries, sugar, and water in a small saucepan.
2. Cook over medium heat until sugar dissolves and jam thickens, about 15 minutes.

Increasing a Recipe

1. The recipe for Strawberry Jam shows that for every 3 cups of strawberries, ½ cup of sugar is necessary. Complete this table to show the amounts of strawberries and corresponding amounts of sugar required when recipe is increased.

Quantities of fruit and sugar in Strawberry Jam

Number of cups of strawberries	Number of cups of sugar
3	½
6	
9	
12	
n	

2. We can think of the number of cups of strawberries and the number of cups of sugar as two variables.
   Let ***x*** represent the number of cups of strawberries.
   Let ***y*** represent the number of cups of sugar.

   a. Which of these two variables does it make sense to call the independent variable? Explain why.
   b. Which of these two variables does it make sense to call the dependent variable? Explain why.

3. Write a formula to express the number of cups of sugar based on number of cups of strawberries.

4. Draw a graph to show the relationship between the number of cups of strawberries and number of cups of sugar. (Hint: Record the number of cups of strawberries along the x-axis and the number of cups of sugar along the y-axis.)

5. Do the points form a line or a curve? Draw a line or a curve to illustrate your answer.

6. What is the ratio of the number of cups of sugar to the number of cups of strawberries?

7. Does the line pass through the point (0,0)?

8. Does the number of cups of sugar needed to make Strawberry Jam vary directly with the number of cups of strawberries? Explain how you know.

*Adapted from: www.edibleschoolyard.org

"Should the Dandelion Be Considered a Weed?" Writing Project

Curricular Areas Covered

Writing	*Reading*
Evaluate reasons to support and opinion	Non-fiction reading for information
Opinion writing	Evaluate text for important details

Materials

- Dandelion information sheets

Procedure

1. As a class, discuss what is already known about weeds.
2. Give students information sheets about dandelions.
3. Read sheets either individually, as partners, or as a class.
4. Students will then write an opinion paper telling whether they think the dandelion should be considered weed or not. Their opinion should be based on facts from the articles.
5. If desired, students could debate the issue based on their writings.

The Benefits of Dandelions

Taken from:
http://www.wildmanstevebrill.com/Plants.Folder/Dandelion.html
Written by: "Wildman" Steve Brill with Evelyn Dean

The dandelion is a perennial, herbaceous plant with long, lance-shaped leaves. They're so deeply toothed, they gave the plant its name in Old French: Dent-de-lion means lion's tooth in Old French.

The leaves are 3 to 12" long, and 1/2 to 2-1/2" wide, always growing in a basal rosette. The dandelion's well-known yellow, composite flowers are 1 to 2" wide. They grow individually on hollow flower stalks 2 to 18" tall. Each flower head consists of hundreds of tiny ray flowers. Unlike other composites, there are no disk flowers.

Dandelions are especially well adapted to a modern world of "disturbed habitats," such as lawns and sunny, open places. They were even introduced into the Midwest from Europe to provide food for the imported honeybees in early spring. They now grow virtually worldwide. Dandelions spread further, are more difficult to exterminate, and grow under more under adverse circumstances than most competitors. Most gardeners detest them, but the more you try to weed them up, the faster they grow.

Collect dandelion leaves in early spring, when they're the tastiest, before the flowers appear. Harvest again in late fall. After a frost, their protective bitterness disappears. Dandelions growing in rich, moist soil, with the broadest leaves and largest roots, are the best. Select the youngest individuals, and avoid all plants with flowers. Some people eat the greens from spring to fall, when they're very bitter. Others boil out the summer bitterness (and water-soluble vitamins) out in two changes of water. It's all a matter of preference.

Dandelion greens are wonderful in salads, sautéed or steamed. They taste like chicory and endive, with an intense heartiness overlying a bitter tinge. People today shun bitter flavors—they're so conditioned by overly sweet or salty processed food. But in earlier times, we distinguished between good and bad bitterness. Mixed with other flavors, as in a salad, dandelions improve the flavor.

I also love sautéing them for about 20 minutes with onions and garlic in olive oil, adding a little home-made wine before they're done. If you're not used to the slight bitterness, cook them with sweet vegetables, especially sliced carrots and parsnips. Boiling dandelions in one or more changes of water makes them milder—a good introduction if you're new to natural foods. Early spring is also the time for the crown—great sautéed, pickled, or in cooked vegetable dishes.

You can also eat dandelion flowers, or use them to make wine. Collect them in a sunny meadow, just before mid-spring, when the most flowers bloom. Some continue to flower right into the fall. Use only the flower's yellow parts. The green sepals at the flower's base are bitter.

The flowers add color, texture, and an unusual bittersweet flavor to salads. You can also sauté them, dip them in batter and fry them into fritters, or steam them with other vegetables. They have a meaty texture that contrasts with other lighter vegetables in a stir-fry dish or a casserole. A Japanese friend makes exceptionally delicious traditional dandelion flower pickles, using vinegar and spices.
The leaves are more nutritious than anything you can buy. They're higher in beta-carotene than carrots. The iron and calcium content is phenomenal, greater than spinach. You also get vitamins B-1, B-2, B-5, B-6, B-12, C, E, P, and D, biotin, potassium, phosphorus, magnesium, and zinc by using a tasty, free vegetable that grows on virtually every lawn. The root contains the sugar insulin, plus many medicinal substances.

A Dandelion Is A Weed

By Alex Russel, All About Lawns Columnist

The dandelion is a strange plant. To some it is a powerful medicinal herb, or a delicious food, while to (most) others it's a mere lawn nuisance. Here is an introduction to a puzzling plant.

When autumn comes, to most lawn experts, it is time to break out the fertilizer and maintenance chemicals. Fall is the perfect time to improve a lawn, tired from the hot summer sun.

Weed Plant Or Friend?

Dandelion is a good example of a Weed Plant that you can go after in the fall. It is much easier to attack the deep-rooted weed in a lawn made wet by the rain and overnight dew. If you wait until spring, it becomes much trickier to get to the weed without hurting your lawn, too.

Dandelions are especially infuriating to lawn care experts because the plant is usually the first to season in the spring. Dandelions then quickly hoard water and nutrients, while absorbing spring sunshine with broad, porous leaves. These may make nice lettuce like vegetables for some, but they steal nutrients from your lawn.

Dandelions Means Lawn Needs Attention

As with all weeds, a surfeit of dandelions simply means that the lawn itself needs attention. The big rooted plant makes its home on your lawn when grass roots are most likely skimpy and weak.

The solution is to not only attend to your grass, but to also focus on the soil. For healthy soil, spread an inch of mature compost evenly over the lawn and let the autumn rains wash it down to the roots over the winter. This is best achieved by dumping the compost out from a wheelbarrow into several piles and then raking it

around evenly on the lawn (a job most children can do!).

Weed Known As Lion's Teeth

The word dandelion comes from a kind of linguistic accident. It's an Anglicization of the French "dent de lion," or "lion's tooth," perhaps inspired by the serrated leaf edge. The late weed historian Larry Mitich guessed that the word arrived in England in the 11th century, with the Normans.

Definition of Weed from Dictionary.com

1. a valueless plant growing wild, esp. one that grows on cultivated ground to the exclusion or injury of the desired crop.
2. any undesirable or troublesome plant, esp. one that grows profusely where it is not wanted: *The vacant lot was covered with weeds.*

Best Use of Garden Space Project

Curricular Areas Covered

Math	*Social Studies*
Geometry	Mapping
Problem Solving	

Materials

- Seed packets
- Worksheet for each student

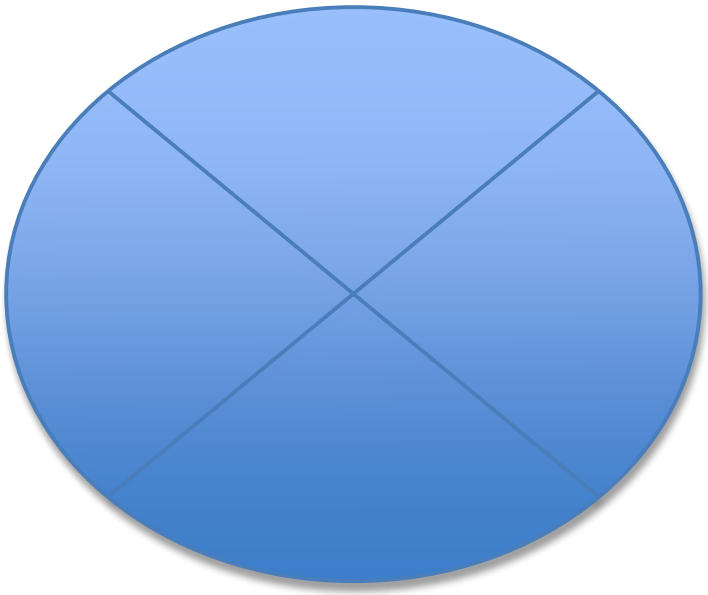
Procedure

1. Students are put in groups of three to four. Each group is given four different seed packets.
2. Teacher explains to students that each type of seed needs a different amount of room to grow to its full advantage.
3. Teacher then shows the students how this information is listed on the back of seed packets.
4. Students are then given worksheet and told that they will be given a quarter of a circle to plant with their seeds. They are to find the most effective use of their space to scale.
5. Students try to find the most effective way in all of the four quarters of the circle. A map key should be completed
6. When completed, the students are to circle the quarter that they feel is the best and hand in worksheet.

Names:_____

Using the circle below, come up with four possible combinations of how to use the space for planting. **Each quarter should be drawn to scale, follow the key that you indicated, and contain all four plants.**

	Type of Plant	Space Needed	Key Legend
Plant One			
Plant Two			
Plant Three			
Plant Four			



Circle the combination that you think is the best. Why did you choose this combination?

_____

_____

_____

Nutritional Value of Garden Vegetables

Curricular Areas Covered

Reading	*Health*
Research	Healthy eating habits

Materials

- Nutritional Value Chart
- Books about Fruits, Vegetables, Vitamins, and Minerals
- Computers (if desired)

Procedure

1. If students are not already aware of what is growing in the garden, take them outside and let them record what is growing.
2. Pass out a copy of the "Nutritional Value Chart" to each student. Have student pick out three vegetables that they would like to research.
3. Explain to students that they are to use books and the Internet to help them find information about the vegetables.
4. Students work independently on chart.
5. Hang charts where all students can see so they are aware of the nutritional value of all vegetables in the garden.

Additional Activities

Social Studies-

With the students, plant gardens specific to the ancient civilizations. The following vegetables were found in the civilizations.

Mesopotamia-leeks, shallots, garlic, lentils, chickpeas, lettuce, cabbage, summer and winter cucumbers
Rome-cabbage, parsnips, lettuce, asparagus, onion, garlic, marrows, radishes, lentils, beans, and beats
Egypt-beans, chickpeas, lentils, leeks, onions, garlic, and green peas
Greece-Garlic, onions, grapes, asparagus, beets, radishes, and mustard seed

Writing-

*Have the students write an expository essay on how to live a healthy lifestyle. Encourage them to incorporate lessons that they have learned from the garden.

*Give students the following prompt. "Imagine that it's your job to convince the principal that a school garden is good for students. What would you say to him/her? Anticipate reasons why the principal might say no." Have students base this on their own experiences in the garden.

Research

Students could research the benefits between homegrown foods versus store bought food. To extend this project, students could research the difference between raw, cooked, frozen, and canned vegetables.

Miscellaneous

*Create rich topsoil by following the directions listed on the following pages.

*Watch a video about the benefits of garden-grown foods with chef and healthy food activist Alice Waters at :

http://www.cbsnews.com/video/watch/?id=4867014n.

Creating Rich Soil

Rich soil is one of the ingredients necessary to grow strong, healthy plants. Humus is one of the main ingredients in great topsoil. To make humus, follow the directions below.

Materials needed: A clean, empty juice carton; soil; fruit and vegetable scraps; scissors; duct tape; a knife

Directions:

1. Tape the open end of the carton shut using the duct tape.

2. Cut a square flap on one side of the carton. Set the carton on its side, open-side up.

3. Cut fruit and vegetable scraps into small pieces. Add to carton.

4. Cover food scraps with a thin layer of soil. Mix everything together.

5. Add more food scraps and soil everyday until the mixture is about an inch from the top of the container. Stir well each time.

6. Stir the mixture once each day for about three weeks. Add water if it looks dry.

7. Add the new mixture, the humus, to your topsoil and begin planting!