Unit Plan

Enclosed are suggested materials to enhance a Science unit on George Washington Carver. Choose the ones best suited for your group. Be sure to enter suggestions in the comment book. If you have any questions or need assistance, please call George Washington Carver at 417-325-4151.

Subject: Science

Grade Level: Regular Education & Special Education (3-4)

Topic: George Washington Carver and his work

Key: A= audio learner, V= visual learner, T/K= tactile/kinesthetic learner

I. Anticipatory Set

A. Purposes and Objectives

1. After class discussion, the student will be able to name the different parts of a peanut and peanut plant with 80% accuracy on a worksheet. (A, V, T/K)

2. After class discussion, the student will be able to state facts about the peanut with 75% accuracy through teacher check. (A)

3. After teacher instruction and hands-on experience, the student will grow a peanut with 75% accuracy through teacher check. (A, V, T/K)

4. After teacher instruction and hands-on experience, the student will be able to make peanut milk with 100% accuracy through teacher check. (A, V, T/K)

5. After teacher instruction and hands-on experience, the student will be able to make peanut butter with 100% accuracy through teacher check. (A, V, T/K)

B. Teaching Resources and Special Instructions (Materials for entire unit)

1. American Peanut Council: www.aboutpeanuts.com
2. George Washington Carver National Monument
3. Worksheets (included)
   a. Label parts of the peanut
   b. Label parts of the peanut plant
   c. Label the countries where peanuts are grown
   d. Map of the United States to label states in which peanuts are grown
4. Peanut seeds (included)
5. Soil
6. Small cups or flower pots (something with drainage holes)

7. Camera (optional)
8. Bag of peanuts (raw, unroasted, shelled peanuts)
9. Mortar (included)
10. Pestle (included)
11. Mason jars (included)
12. Colander (included)
13. Blender
14. Salt
15. Peanut oil or vegetable oil
16. Spatulas
17. Cracker or Bread

C. Motivation

1. Students will learn lots of fun facts about peanuts!
2. Students will make milk from peanuts.
3. Students will make peanut butter using a blender.
4. Students will grow their own peanut.
5. Students will have fun!

D. Background and Prerequisite Knowledge Check

1. What is a peanut?
2. What does a peanut look like?
3. Who is George Washington Carver?
4. What did he use the peanut for?

E. Vocabulary Development

1. Mortar & Pestle- tools that are used for grinding items.
2. Fertilizer- soil that helps plants grow.
3. Boll Weevil- insect that infects plants.

II. Instructional Input

A. Main Points and Supporting Details

1. Label parts of a peanut (A, V, T/K) (Objective 1)
   a. Germ
   b. Endocarp
   c. Exocarp
   d. Pericarp
   e. Mesocarp
   f. Cotyleden
   g. Testa

Complete worksheet provided to label parts of a peanut. Worksheet should be done together as a class (using a transparency would be helpful). Discuss the meanings of the prefixes: endo-, meso-, and exo-. Each part of the peanut needs to be investigated so that the students understand what the particular part is. Let every student touch the peanut as they complete their worksheet.

??? What is the most important part of the peanut?
??? What part of the peanut is edible?
??? What are all of the different parts of a peanut?
??? What is the hardest part of a peanut?

2. Label parts of a peanut plant (A, V, T/K) (Objective 1)

   a. Root
   b. Peanut
   c. Peg
   d. Ground
   e. Leaf
   f. Bloom
   g. Stem

   Complete worksheet provided to label the parts of a peanut plant. Worksheet should be done together as a class (using a transparency would be helpful). Each part of the peanut plant needs to be investigated so that the students understand what the particular part is. Have a peanut plant on display. Peanut plants grow into green plants approximately 18 inches tall with yellow flowers.

   ??? What is the most important part of a peanut plant?
   ??? Do we consume all the parts of a peanut plant?
   ??? What color is a peanut plant?

3. Peanut Fun Facts (A) (Objective 2)

   a. Peanuts have various names (goober, guinea seed, pinda, pistache de terre, groundnut, monkey nut, earthnut, manilla nut, and legume)
   b. Peanuts originated in South America
   c. Peanuts are excellent foods for pigs
   d. Peanuts are sold at baseball games
   e. George Washington Carver developed more than 300 uses for the peanut
   f. Peanuts are used as a cash crop in the South
   g. Peanuts helped Southern farmers fight against boll weevils
   h. Peanuts are grown in Asia, Africa, Australia, North America, and South America (warm climates) (see worksheet to label different countries)
   i. The following states in the United States grow peanuts: Texas, Alabama, North Carolina, Oklahoma, Virginia, Florida, South Carolina, and New Mexico (see worksheet to label the states)

j. Peanuts contain 6 essential vitamins (folate, vitamin E, niacin, thiamin, B6, and riboflavin
k. Peanuts contain 7 essential minerals (copper, phosphorous, magnesium, iron, potassium, zinc, and calcium)

Orally quiz the students over these fun facts. Most of these fun facts will be stressed in other lessons throughout the Traveling Trunk. Divide the students into groups or partners and have them quiz each other over peanut fun facts. (See www.aboutpeanuts.com for additional peanut fun facts).

??? Who developed over 300 uses for the peanut?
??? What are some vitamins and minerals peanuts contain?
??? Name some states where peanuts are grown.
??? Name some continents where peanuts are grown.
??? State some other names for a peanut.

4. Growing a peanut (Long-Term Project) (A, V, T/K) (Objective 3)

a. Materials needed:
   1. raw, unroasted, shelled peanuts
   2. small cup or flower pot (container with a drainage hole)
   3. sandy soil
b. Soak peanuts overnight
c. Fill pot with soil to one inch below the rim
d. Plant 3 peanuts 1 to 1 ½ inches deep and cover firmly with soil, but do not pack
e. Keep soil moist, but not wet
f. Maintain a temperature of 65 degrees or above
g. Peanuts should sprout in 5-8 days. Continue to keep the plant in a warm room and exposed to direct sunlight as much as possible (a heat lamp may be needed)
h. The peanut plant will begin to flower within 45-50 days after sprouting
i. The plant will actually produce peanuts between 125-150 days

The teacher may want to start the plant ASAP so that the students may be able to see one. Each student may have their own plant or work in small groups. Give the students the option to also try this at home. They can compare the differences in the plants at school and at home. A camera would be useful to track the progress of the peanut plant. If the classroom gets cool during the day or at night, a heat lamp may be needed to help keep the peanut plant healthy. Posting a copy of the peanut plant worksheet by the plant would be helpful, so that the students can pick out the different parts of a peanut plant. Have the students create a chart or journal to record the growth of their peanut plant.

??? How many days does it take to produce a peanut?
??? For a peanut to grow, what does the temperature need to be?
??? Should the soil of a peanut plant be dry, soaked, or moist?
??? When will a peanut plant start to sprout?
??? When will a peanut plant start to flower?

Compare and contrast your school peanut plant and your home peanut plant.

5. Peanut Milk (A, V, T/K) (Objective 4)
   *Note- Please check with your school health codes before allowing students to sample food products. Remember, scientists **never** eat or drink in their laboratories.

   a. Materials needed:
      1. shelled raw peanuts
      2. mortar and pestle
      3. mason jars
      4. water
      5. strainer
   b. Crack the shell and remove outer skin (reddish-brown part) away from peanuts and throw away
   c. Put raw peanuts into the mortar bowl
   d. Grind the peanuts with the mortar and pestle until they are a fine flour
   e. Pour the peanut flour into a mason jar
   f. Add 2 parts very HOT water to 1 part peanut flour (OR bring the water/peanut flour mixture just to a boil while stirring constantly (Remove, cool, and then strain)
   g. Seal the mason jar with the lid
   h. Shake the jar vigorously until a white substance forms
   i. Strain (watch the oils (creams) rise to the top)
   j. The white substance is peanut milk
   k. Let all the students smell the milk

   All students will get the chance to grind the peanuts and shake the mason jar. Encourage students to try this at home.

   ??? What did the peanut milk smell like?
   ??? How is peanut milk made?
   ??? What minerals and vitamins are contained in peanut milk?

6. Peanut Butter (A, V, T/K) (Objective 5)
   *Note- Please check with your school health codes before allowing students to sample their food products. Remember, scientists **never** eat or drink in their laboratories.
   a. Materials needed:
      1. Blender (or mortar and pestle method)
      2. 1 cup roasted peanuts
      3. ¼ teaspoon salt
      4. 1 teaspoon peanut oil
      5. Spatula
      6. Crackers or bread
   b. Place roasted peanuts, salt, and peanut oil in blender (or place roasted peanuts in mortar and crush with pestle finely; add a few drops of oil; blend; add salt and sugar as desired)
   c. Blend briefly

d. Turn blender off and push whole peanuts to bottom of blender
e. Blend for a few more minutes (blend until all peanuts have been blended)
f. Enjoy

The teacher should run the blender and be sure all little hands stay away from the blender. Spread the peanut butter on bread or crackers for the students to enjoy. Have the students compare blender peanut butter to store bought peanut butter.

??? What does the peanut butter taste like?
??? How is peanut butter made?
??? Does blender peanut butter taste differently from store bought peanut butter?

B. Modeling, Illustrating, Demonstrations

1. Naming the parts of a peanut
2. Naming the parts of a peanut plant
3. Stating peanut fun facts
4. Growing a peanut
5. Making peanut milk
6. Making peanut butter

C. Checking for Understanding

??? What is the most important part of the peanut?
??? What part of the peanut is edible?
??? What are all of the different parts of a peanut?
??? What is the hardest part of a peanut?
??? What is the most important part of a peanut plant?
??? Are all of the parts of a peanut plant consumed?
??? What color is a peanut plant?
??? Who developed over 300 uses for the peanut?
??? What are some vitamins and minerals peanuts contain?
??? Name some states where peanuts are grown.
??? Name some continents where peanuts are grown.
??? State some other names for a peanut.
??? How many days does it take to produce a peanut?
??? For a peanut to grow, what does the temperature need to be?
??? Should the soil of a peanut plant be dry, soaked, or moist?
??? When will a peanut plant start to sprout?
??? When will a peanut plant start to flower?
??? Compare and contrast your school peanut plant and your home peanut plant.
??? What did the peanut milk smell like?
??? How is peanut milk made?
??? What minerals and vitamins are contained in the peanut milk?
??? What does the peanut butter taste like?
??? How is peanut butter made?

??? Does blender peanut butter taste differently from store bought peanut butter?

III. Student Accountability

A. Checking for Understanding (see Instructional Input)

1. Labeling peanut parts and peanut plant parts (Objective 1)
2. Noting peanut fun facts (Objective 2)
3. What supplies are needed to grow a peanut? (Objective 3)
4. How is peanut milk made? (Objective 4)
5. How is peanut butter made? (Objective 5)

B. Guided Practice

1. Complete peanut part and peanut plant worksheet as a class (Objective 1) (A, V, T/K)
2. State peanut fun facts (Objective 2) (A)
3. Grow a peanut at school (Objective 3) (A, V, T/K)
4. Make peanut milk at school (Objective 4) (A, V, T/K)
5. Make peanut butter at school (Objective 5) (A, V, T/K)

C. Independent Practice

1. Quiz each other over the peanut, peanut plant parts, and peanut fun facts (Objective 1, 2) (A)
2. Grow a peanut at home (Objective 3) (A, V, T/K)
3. Make peanut milk at home (Objective 4) (A, V, T/K)
4. Make peanut butter at home (Objective 5) (A, V, T/K)

D. Transfer and Application

1. The student will write a summary over all of the different activities stating what they did and what they learned. (Objectives 1, 2, 3, 4, 5) (A, V, T/K)

IV. Use of Technology

A. The students can preview the PowerPoint presentation available in the Traveling Trunk to aid with lessons.
B. The students and teacher may visit the Peanut Council's website for valuable information at www.aboutpeanuts.com
C. The teacher may make transparencies of any information to better relay the information contained in the unit plan for the students.
D. The teacher may want to videotape some of the lessons, so that the students may view themselves making the peanut milk and the peanut butter.

E. The teacher may want to have the students view some of the videos in the trunk to Better understand information in this unit plan.
F. The teacher may want to use a camera to record the growth of the peanut plants in the classroom.

V. Cultural and Linguistic Diversity

A. For student success, the students will be using objects that they have come in contact with before. (Let the students preview items that they have not used before).
B. The majority of the materials needed are provided in the classroom or the Traveling Trunk.
C. Teacher may need to provide translations of materials for ESL students.
D. The teacher may need to explain terms from this unit that the students are not familiar with due to their personal culture.

VI. Modifications

A. The students will have resources available to them to practice the activites at a later date if needed.
B. The students will have simplified instructions for understanding.
C. The students will not have to participate in the activities if they are not comfortable completing the activities.
D. Some students may need help applying pressure to grind the peanuts using the mortar and pestle.

VII. Adaptations

A. Some students may need and enlarged worksheet so that they can see it better.
B. Some students may need extra help writing the summary paragraphs. Either allow extra time, shortened assignments, or have the student tell the teacher what they want their summary to say.

VIII. Closure

A. Review with student participation

What is the most important part of the peanut?
What part of the peanut is edible?
What are all of the different parts of a peanut?
What is the hardest part of a peanut?
What is the most important part of a peanut plant?
Are all the parts of a peanut plant consumed?
What color is a peanut plant?
Who developed over 300 uses for the peanut?
What are some vitamins and minerals peanuts contain?

Name some states where peanuts are grown.
Name some continents where peanuts are grown.
State some other names for a peanut.
How many days does it take to produce a peanut?
In order for a peanut plant to grow, what does the temperature need to be?
Should the soil of a peanut plant be dry, soaked, or moist?
When will a peanut plant start to sprout?
When will a peanut plant start to flower?
Compare and contrast your school peanut plant and your home peanut plant.
What did the peanut milk smell like?
How is peanut milk made?
What minerals and vitamins are contained in the peanut milk?
What does the peanut butter taste like?
How is peanut butter made?
Does blender peanut butter taste differently from store bought peanut butter?

B. Anticipatory Set

IX. Self-Evaluation and Reflection

A. Things that worked. Why?
B. Things that didn't work. Why?
C. Specific plans for improvement.