How Does Your Blue Bonnet Grow?

Part I:

A.) Subject/ Topic/ Curriculum: Science/Environment

1.) Subject: Science/ Growing Blue Bonnets
Social Studies- Texas Symbols
Math- Charting, Graphing, interpreting data

2.) Grade Level: 4th/5th

Learning Objective: This lesson will take place throughout the school year beginning in October and be completed in March or April when the Blue Bonnets have bloomed. At the end of the lesson:

1.) The learner will be able to identify and describe All five specimens of Texas Blue Bonnets.

2.) The learner will be able to demonstrate and evaluate under which Conditions Texas Blue Bonnets grow best.

3.) The learner will be able record data about the growth and development of Texas Blue Bonnets.

4.) The learner will be able to display the recorded data in a graph.

5.) The learner will be able to describe and discuss the growth cycle Of plants and the value that plants have to society.

6.) The learner will be able to write about and discuss completely the History of the Texas Blue Bonnet and its importance as a Texas State Symbol.

B.) TEKS:

§112.6. Science, Grade 4/5

(a) Introduction.

(1) In Grade 4 and 5, the study of science includes planning and implementing field and laboratory investigations using scientific methods, analyzing information, making informed decisions, and using tools to collect information. Students also use computers and information technology tools to support scientific investigations.

(2) As students learn science skills, they identify components and processes of the natural world including properties of soil, and the role of the Sun as our major source of energy.

(6) Investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and that methods, models, and conclusions built from these investigations change as new observations are made.

TEKS (Cont.)

(b) Knowledge and skills.

(1) Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:

(A) demonstrate safe practices during field and laboratory investigations; and

(2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:

(A) plan and implement descriptive investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;

(B) collect information by observing and measuring;

(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;

(D) communicate valid conclusions; and

(E) construct simple graphs, tables, maps, and charts to organize, examine, and evaluate information.

(3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:

(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;

(4) Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:

(A) collect and analyze information using tools including calculators, rulers, thermometers, meter sticks.

(6) Science concepts. The student knows that change can create recognizable patterns. The student is expected to:

(A) identify and observe effects of events that require time for changes to be noticeable including growth.

(11) Science concepts. The student knows that the natural world includes earth materials and objects in the sky. The student is expected to:

(A) test properties of soils including texture, capacity to retain water, and ability to support life;

(C) identify the Sun as the major source of energy for the Earth and understand its role in the growth of plants, in the creation of winds, and in the water cycle.

Other TEKS:
Social Studies Chp113

Mathematics Chp111

Part III: Instruction:

A.)Engage:
The teacher will affix a United States Map to the blackboard at the front of the room. Then divide the class into five teams. Each team will consist of no more than 5 members. Each member will select two pictures from a stack the teacher has placed on the desk next to the map. The pictures will be of each state's official state flower, but there will be no way for students to identify which flower goes with which state. The teacher will ask students to think about what they know about each state in the Union in terms of climate, weather, soils, elevations ect, and then try to decide which state might possibly grow which flower in the pictures with that information in mind.

The teacher will begin with Team 1 and continue through Team 5. One team at a time the teacher will allot 30 seconds for the team to place their pictures on the map in the state in which they believe their flower belongs. After all the flowers are affixed to the map the teacher will hold up a live sample of a "Texas Blue Bonnet" and ask "Anyone know where this state flower belongs?" After taking a few guesses the teacher will affix the flower on the state of Texas and re-arrange the pictures to go with the correct states. Then the teacher will explain to the class that "It's time for them to discover the Texas State Blue Bonnet."

B.)Explore: The students will be given a list of resource books and websites. Then working in teacher assigned groups they are to obtain information about Texas Blue

Bonnets. The students should collect information regarding the different types of Blue Bonnets, the best soil and weather conditions that they will grow in. General gardening information on how best to care for and with regard to plants and flowers with particular attention to Blue Bonnets. Each group will keep a Blue Bonnet notebook that will store all the research information they discovered. All students will record both daily and weekly observances in their individual science journals through out this project. .

Resources for Explore:

Bluebonnet Texas Pride

http://aggie-horticulture.tamu.edu/plantanswers/flowers/bluebonnet/bluebonnetstory.html

Texas Bluebonnets
www.dalebroux.com

Texas Handbook Online
www.tsha.utexas.edu

Garden Guide
www.gardenguides.com/articles/bluebonnets.htm

SFA Native Plants Center

http://arboretum.sfasu.edu/link.htm

"The Texas Bluebonnet" Andrews, Jean, University of Texas Press Revised ed. Austin TX. March 1993.

C.)Explain: The students will be shown a PowerPoint presentation with the following vocabulary words left without definitions. The teacher will initiate a class discussion on the meanings of these words. The teacher will take suggestions from the students until all the words have workable definitions. At this time the teacher will respond to any word that needs clarification.

Vocabulary:

1.) Lupinus Subcarnosus- This type of Bluebonnet grows primarily in Northern part of Hildalgo Co.

2.) Lupinus Texensis- Most familiar form of Bluebonnet and a favorite with both Texans and tourists. They grow primarily in Central Texas and along highways.

3.) Lupinus Havardii- This variety is the most majestic as it grows up to three feet tall. This variety grows in the Big Bend region of Texas.

4.) Lupinus Cocinnus- White or Rosy purple variety of the Bluebonnet . This type of flower favors the sandy regions in the state of Texas

5.) Lupinus Plattensis- This is the only perennial variety of Bluebonnet. It is found in the Trans-Pecos area of the state.

6.) Perennial- Lasting all year long

7.) Soil- element made up of dirt rocks and organisms in which to grow flowers and plants.

8.) Seed- the beginning form of a plant or flower.

9.) Germination- process that occurs after a seed has been planted in the soil and the first stem of a plant has pierced the seed shell.

10.)Root System- Life support for the flower or plant wear water and nourishment are stored for the plants growth. Also the plant's method of affixing itself within its environment.

11.)Scarification- chemical process that allows for better germination among plants and flowers.

12.) Fungi- a form of decay and molds from other organisms.

13.) Organic substance like manure or "miracle grow" that provides nourishment for and aids in the growth of plants.

14.) Water drainage- process by which the soil adequately accepts the needed water for plants and absorbs it into its root system with no standing water surrounding the plant.

15.) Pill Bug or Roly Pollie- a small crustesean who is the natural enemy of Bluebonnets. This creature likes to feed on the young plants prior to their first bloom.

The teacher will then discuss the different possible jobs within the group as the groups get ready to plant their Bluebonnet seeds.
The teacher will handout a sheet with the following jobs and descriptions and asks each member to sign up for one job.

Jobs:

Gardner: This person will be responsible for the supervising the planting of the bluebonnet seeds making sure that the seeds are planted in the correct location and in the correct manner. The on-going responsibility of this job is to ensure that the plants receive all necessary nourishment to ensure growth. (Water, sunshine, coverage during cold weather, plant food if required.) The gardener will record all their activities in their science journal and share the information with the group.

Observer/Recorder: This person will record the growth and development of the flowers on a weekly basis. This person will measure plant length and width and record the various cycles the flower passes through. This person will record all the information in their science journal to share with the group. The observer/recorder will make observations on a weekly basis.

Data Analyzers: This position should be held by two members of the group. They will take the information provided by the gardener and the observer and place it into an informational graph or chart to be turned in at the completion of the project. These students will record their own observations on the data in 5heir journals to share with the group.

Project Writer: This student will write a brief project summary of the "growing bluebonnets lab, the summary need not be longer than one page typed or two pages handwritten. This person will conduct interviews with each group member for the summary. This person will also record the weekly operations and activities performed by the group and keep them in their individual science journal.

After the students have selected their job they may meet with their group and decide how they wish to proceed with planting. They will have the options of using growth enhancers or not using them, but the decision must be made by the group. All groups will plant their seeds in the class garden outside the classroom under the supervision of both the instructor and the group's gardener who will be available to trouble shoot any problems that may arise with planting.

All students will meet at least once weekly for an update report on all phases of the project and to discuss any concerns any to obtain feedback from the instructor.

At the end of the project all the groups will present their bluebonnets to the class and discuss the growth cycle and process involved in caring for the plants. Students will present their charts at this time and written and oral materials to the class.

D.)Extend: Students will select a state flower from the United States Map used at the beginning of this lesson. They are to research the flower of their choice and then plant the flower in an individual planter and care for it and record its growth and development in their science journals.

E.)Evaluate: Students will do both a written and oral and visual presentation on a Tri-Board comparing and contrasting the flower they grew individually with the Texas Bluebonnets grown in group. Students should include in the report an understanding of basic growth concepts of plants and flowers and how plants and flowers impact on the environment of man, and the importance of these plants at State Symbols. Students will also turn in their individual journals as part of their grade.

Closure: Students and the Instructor will view each project that will be displayed around the room and briefly discuss the concepts learned by participating in this project. Students will also be asked to give one example of the relationship between what they learned in class and how they can apply it in everyday life.

Created by Julie Kilcullen, September 2006