**2nd Grade**

*~Plant Experiment~*

**Materials and Time**

Bean seeds

Pots/Dixie cups

Soil

Water

Paper packets

Recommended time is 3-4 weeks *before* the trip to BioTrek

**State Standard**

Ecosystems: Interactions, Energy, & Dynamics 2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.

**Objectives**

* Students plan how to conduct their own experiment to see plant growth
* Students conduct an experiment
* Students determine what plants need to survive

**Anticipatory Set/ Linking to prior knowledge**

* Have some idea as to how plants grow
* Know how to take down/draw what they observe in an organized manner

Water and Sunlight Experiment

**INSTRUCTORS VERSION**

STEP 1

Tell students that they will be planning and conducting an experiment on plants to see if they need water and sunlight to grow. Have them discuss their idea(s) with their classmates for about 10-20 minutes. After the time is up, ask them what they came up with.

STEP 2

After hearing their ideas, say you are combining what they came up with to create the plant experiment.

STEP 3

Give small talk/lesson about plants.

STEP 4

Divide the student up into groups of 4. Hand out materials to each group.

Materials are for four different treatments: 1 plant with no water (will receive sunlight), 1 plant with water (will receive sunlight), 1 plant with sunlight (will receive water), 1 plant with no sunlight (will receive water).

Handout a packet/booklet to each student, here they will write down their observations and hypothesis about the plants. Students should come up with a hypothesis and write it down.

STEP 5

Groups will place their pots in the appropriate conditions. Allocate a certain amount of time for students to care for plants and take down observations in the packet. Recommended time is 10-20 minutes every 3-4 days for 3-4 weeks.

STEP 5

Conduct experiment during the 3-4 weeks, and take down observations and drawings of plants. Once plants are fully-grown have students see if they need water and sunlight.

STEP 6

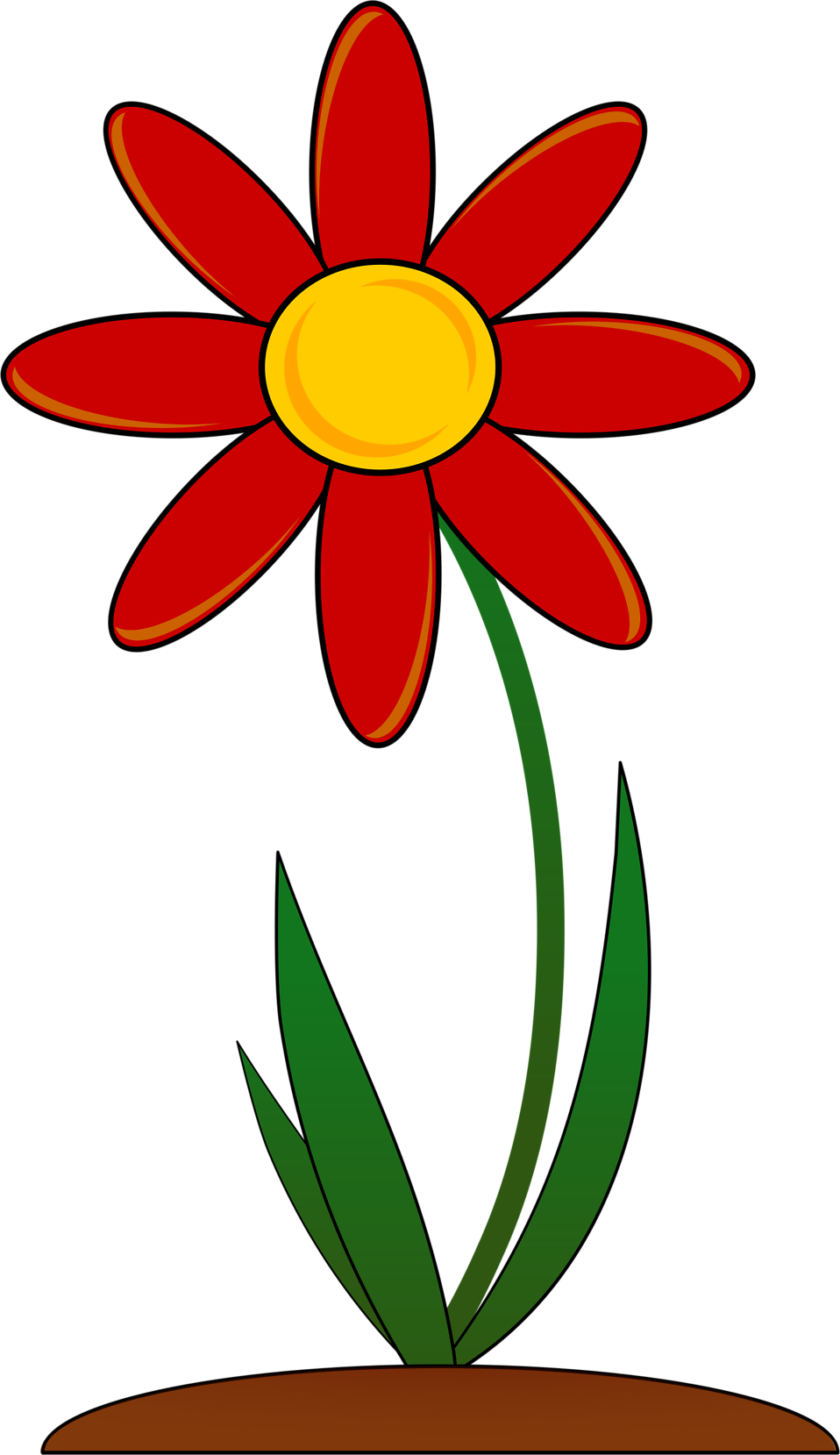
Field trip to BioTrek.

STEP 7

Once back in class, students can state if their hypothesis was correct or incorrect. Students will use their observations and knowledge from their own plant experiment and from their trip to BioTrek, where they will make observations of the plants in the rainforest and Ethnobotany garden.

STEP 8

Hand out paper with questions about plant growth and what they learned. They can answer the questions in their notebook and write a 1 paragraph reflection on what they learned about plants.

Conducting a Plant Experiment

http://res.freestockphotos.biz/pictures/15/15378-illustration-of-a-red-flower-pv.png

Plants are everywhere on the planet and they help us out so much. So it is important to know how they work and what they need in order to survive. *Do plants need water and sunlight to survive?*

Today you will become a scientist and conduct your own experiments to see what plants need to stay alive!

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1. What do plants need to grow?
2. What happened when your bean seeds did not get water?
3. What happened when your bean seeds did not get sunlight?
4. What kind of plants where there at BioTrek? Give a few examples.

C:\Users\Owner\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\4WP3RGP6\MC900056254[1].wmf*~Solar Panel Activity~*

**Materials and Time**

* 1 piece of paper
* Pencil
* 20 minutes

**State Standard**

Engineering Design K-2-ETS1-1 standard: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

**Objectives**

* Gather information to find a problem
* Think about possible solutions to the problem
* Understand how alternative energy works

**Anticipatory Set/ Linking to prior knowledge**

* How electricity works
* How electricity is utilized to power things in homes
* How many appliances or electronics are powered by electricity

**Instructions**

Hand out the activity below. Explain to your students that when they get home they should complete it and bring in it in the next day. After they have brought in their responses they will share what they wrote down to the entire class. Have the students talk about their ideas on what improvements solar panels could have for about 15-20 minutes and then share again with the class.

Solar Panels



https://upload.wikimedia.org/wikipedia/commons/2/2c/Fixed\_Tilt\_Solar\_panel\_at\_Canterbury\_Municipal\_Building\_Canterbury\_New\_Hampshire.jpg

Today you learned about solar panels and how they harness sunlight to make energy.

1. What are some objects that can be powered by solar energy?
2. Look around your home and see what else could be powered by solar panels. List **3** items you have in your house that could be powered by solar panels
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Could what you found be developed into something new?

*~Light Bulb Activity~*

**Materials and Time**

* 1 piece of paper
* Pencil
* 20 minutes

**State Standard**

Engineering Design K-2-ETS1-1 standard: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

**Objectives**

* Gather information to find a problem
* Think about possible solutions to the problem

**Anticipatory Set/ Linking to prior knowledge**

* How many lights are in ones house
* How electricity is utilized to power things in homes
* How many appliances or electronics are powered by electricity

**Instructions**

Hand out the activity below. Explain to your students that when they get home they should complete it and bring in it in the next day. After they have completed the activity, review it with them. Review the two different light bulbs and ask student to share what kind they have at their home. Also ask if they did anything to change their light bulbs if they had the incandescent light bulb.

It Will Light the Way

https://upload.wikimedia.org/wikipedia/commons/3/31/06\_Spiral\_CFL\_Bulb\_2010-03-08\_(white\_back).jpg

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Fluorescent Light Bulb Incandescent Light Bulb

During your trip through BioTrek you used the human powered generator to power a pair of light bulbs.

1. Which did you have to petal harder to get it to light up?
2. Which light bulb do you have in your home?
3. Do you think that they use a lot or a little bit of energy?
4. If you think that the light bulbs you have in your home use too much energy what can you do to change that?