Sunlight Necklaces

Summary

Students will create living necklaces to explore the power of sunlight.

Materials

Microcentrifuge tubes
- *Observing Sunlight Necklaces*
Opaque film canister
Radish seeds
Potting soil
UV beads
Assorted sun screen/ lotion
Petrie dishes
Chenille stems

Additional Resources

Books

- *How a Seed Grows*
, Helen J. Jordan; ISBN 0-06-445107-0
- *From Seed to Plant*
, Gail Gibbons; ISBN 0-8234-1025-0
- *Science Saurus, A Student Handbook*
, ISBN 0-669-48192-0
- *Ed Thoughts, What We Know About Science Teaching and Learning*

Videos

- *How Seeds Get Here...and There*
, MBG Videos
- *What's Inside a Seed?*
, Coronet, The Multimedia Co.

Articles

- *Problem Solver*
, Garry R. Hardy and Marvin N. Tolman, Department of Elementary Education, Brigham Young University, Provo, UT.

Organizations

Living Necklace Kits 1-435-797-0765 (Agriculture in the Classroom website below)
UV Beads, Bolek's Craft Supply, Inc. 1-800-743-2723 (website below)

Background for Teachers

The embryo inside a seed is "asleep" until it germinates. Some seeds are dormant and will only become active after a certain environmental occurrence, such as fire, a certain length of time chilled, or light. The seed first takes in a lot of water, which causes it to expand and break the seed coat as well as signaling the embryo to start to grow again.

In a developing corn or wheat seedling (monocots), the epicotyl give rise to the stem and leaves, while the hypocotyl and radicle give rise to the roots. The embryo is partially surrounded by endosperm. The cotyledon stores food.

In the developing bean seedling (dicots), the epicotyl gives rise to the terminal bud, the leaves, and the upper part of the stem. The hypocotyl gives rise to the lower part of the stem and the radicle gives

rise to the roots.

Intended Learning Outcomes

1. Use science and process thinking and skills
2. Manifest scientific attitudes and interests.

Instructional Procedures

Invitation to Learn

Hand out two UV beads per student. Do not tell them what they are, but ask students to make observations about them. Tell students to make a bracelet for these, and they can wear them all day while making observations.

Instructional Procedures:

Sunlight Necklaces

In the lid of the canister, with a pen, place a small X in the middle of the lid. With a drill place a hole and make the hole large enough so the microcentrifuge fits in the hole, because when the student is not wearing the necklace it will stay in the canister stand.

Now that the stand has been completed place it to the side. Fill the microcentrifuge tube with moist potting soil or a moist cotton ball. Fill the tube being careful not to pack the soil down otherwise the roots will not a have a chance to grow.

Now that the soil is in the tube take a very sharpened pencil and make a depression in the soil about 0.25 cm deep. Drop one of two seeds into the depression and cover the seeds up being careful not to pack the soil down. Place the tube into the holder.

Cut a string about 18 inches long to put through the hinges so the microcentrifuge can be worn around the neck.

Walk around the school and make observations of all the plants that need sunlight. (Students will notice right away that their bracelets change colors.) When you go back into the classroom discuss what happen and why.

Use a picture journal daily, to track the progress of the plants in the sun and the plants that will be left in the shade.

Discuss ways that we protect ourselves from the harmful rays of the sun.

UV Beads

Divide class into groups.

Pass out Petrie dishes, three beads, and sun screen/lotion.

Put various sun screen products on the beads and place in Petrie dish. Label Petrie dish lid with sun screen type and SPF.

Go outside and observe what happened to the beads. Have students record in their journals what they learned.

Extensions

Curriculum Extensions/Adaptations/ Integration

Place one of the living necklaces inside a cupboard and observe what happens over time.

Give one living necklace more water and observe what happens over time.

Cover one living necklace with black paper and observe what happens overtime.

Write a cinquain poem about a plant, a sunflower, or sun. A cinquain is an unrhymed poem that is five lines long with each line having a specific pattern. A cinquain is a form of free verse, which means that the lines of the poem do not have to rhyme. Follow the directions below to write a cinquain poem.

Line 1 is a one-word subject or topic.

Line 2 has two adjectives (describing words).

Line 3 contains three verbs (action words) usually ending in "ing"
Line 4 is a four-word phrase giving your personal reaction to the subject (how you feel about it).
Line 5 has a one-word synonym (word that means almost the same thing) for the subject.
Brainstorm and make a list of adjectives, "ing" words, and synonyms for the words you are planning on using. This will assist students in writing their own poems.
Play or sing "Sunlight" by Annette Van Wagenen, Core Academy 2003.
What have we recorded in our journals about the heat and light concept? Do the journals indicate awareness of the lessons taught?

Who, What, Where, When, Why poem
Who -- The Sun
What -- Is giving heat and light
Where -- To the Earth
When -- Everyday
Why -- Because...

Family Connections

Have students collect data on the number of living plants that are in their home. Estimate how much light each plant receives and discuss if some plants need more light than others.
Students share their Sunlight Necklaces with their families.
Students share their UV bracelets with their families.
Observe how sunlight effects plant growth around the house.

Assessment Plan

Students draw daily pictures of their Sunlight necklaces in their science journal.
Inquiry questions -- Are there going to be roothairs? Where is the plant going to come out?

Bibliography

Research Basis

Bransford, J.D., Brown, A.L., & Cocking, R.R., (Eds.). How people learn: Brain, mind, experience, and school. *Science Education*, p. 20

The persistence and curiosity of children are sustained by adults who direct their attention, structure their experiences, support their learning attempts, and adjust the complexity and levels of difficulty of information for them.

National Research Council. (1996). National science education standards. *Science Education*, p. 82

A solid foundation in scientific inquiry strengthens many of the skill that people use daily, such as creatively solving problems, thinking critically, working cooperatively in groups, effectively using technology, and valuing life-long learning.

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