

Plant Reproduction Strategies

Teacher's Guide

Subject: Integrated Science (Life; Earth-Space)

Topic: Sexual and asexual reproductive strategies selected plants

Summary: This lab introduces students to the two main forms of plant reproduction: sexual and asexual. Students will examine selected plants and look for features associated with sexual and asexual reproduction. Because it would be advantages for the students to dig up the plant to identify rhizomes or suckers, it is recommended that invasive exotics be used if possible

After completing the field lab, students will be able to:

Objective(s):

1. Identify and describe the sexual reproductive mechanisms for various plants
2. Identify and describe asexual reproductive mechanisms for various plants
3. Identify and describe the advantages and disadvantages of each approach as well as conditions that favor one over the other.

Ecosystem(s): Pinelands, Hammocks, or Scrub

Equipment:

- Tape measure
- Magnifying glass
- Measuring rod
- GPS receiver

Background:

- Vocabulary: seed, flower, germination, pollen, fertilization, asexual, sexual, fruit
- Reference Material: <http://www.nsl.fs.fed.us/wpsm/Serenoa.pdf>; <http://wfrec.ufl.edu/range/sawpalm/research.html>; http://www.sms.si.edu/irLspec/Sereno_repens.htm;
- Equipment Training: none

Procedure (Engage; Explore; Explain)

1. The students will assemble at the restrooms at the end of the Osprey Trail.
2. Engage the students by asking a specific question that gets to the heart of the activity: Some plants can reproduce both sexually (producing flowers and fruits) and asexually (through rhizomes or runners). What advantage might one approach have over the other? Use the students' answers to ascertain what they already know, clarify any misconceptions, and then ask them to formulate their own hypothesis relating to their own expectations of the outcome of the lab.
3. Fill-in the hypothesis on the top of the student data sheet.
4. In your pre-determined area, complete the observations and measurements identified on the student data sheet. You will find Prickly Pear, Saw Palmetto, Pine, Railroad vine, Sea Oats, and a (Black Eyed Susan type) flower.
5. After completing the lab, allow the students to answer the discussion questions as a group and explain their answers relating them to the concepts, processes and skills associated with the activity. Students should record their answers individually. At this time, facilitators can introduce/explain the specific concepts and explanations in a formal manner.

Sunshine State Standards:

Science: SC.D.1.3.3,4; SC.D.2.3.2; SC.F.1.3.1; SC.F.2.3.1-3; SC.G.1.3.2-4; SC.G.2.3.4; SC.H.1.3.4; SC.H.2.3.1 **Language Arts:** LA.A.1.3.3; LA.C.1.3.1, 4

Mathematics: MA.A.3.3.3 **Social Studies:** SS.A.6.3.2; SS.B.2.3.6, 9

Plant Reproduction Strategies

Student Data Sheet

General Information

| | | | |
|------------------|--|-------|--|
| Full Name: | | Date: | |
| Science Teacher: | | Time: | |

Student Hypothesis and Rationale

If asexual reproduction generates offspring directly from leaves, stems or roots of the parent plant, then (choose one: asexual/ sexual) reproduction has a better chance in having its offspring grow in areas farther away from the parent, because _____

Field Observations/Measurements/Data

| Plant | Is there evidence of flowers or cones? (If yes, describe: Flowers or Cones) | Is there evidence of vegetative or asexual reproduction? If yes, describe: runners, rhizomes, suckers, tubers, propagation, etc.) | What is the reproductive strategy of the plant? (sexual; asexual; both) | What is the estimated distance that the offspring will grow from the parent? |
|-------|--|--|--|--|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |

Plant Reproduction Strategies

Assessment

1. What was the furthest estimated distance that the offspring would grow? Was the reproduction strategy sexual or asexual?

2. How many of the plants you observed used both sexual and asexual reproduction strategies?

3. Does your data support your hypothesis? Whether your hypothesis is supported or not, what can you infer from your observations, measurements, and results?

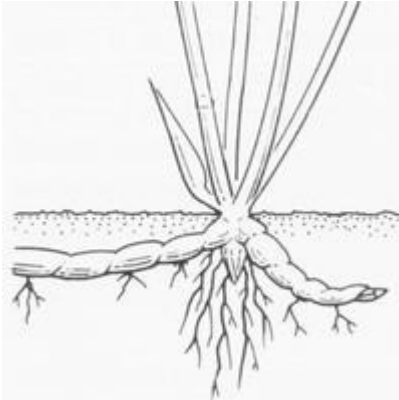
4. If a bear eats a saw palmetto seed and travels at 2 miles/hour for 11 hours before excreting the seed, how far could the first generation plant move from its parent? What about the fourth generation plant (assume the bear is still regular and maintaining the same speed)?

5. If a disease outbreak occurred in a population of plants, which types of plants might have the necessary genetic diversity to survive the disease (asexually or sexually reproduced plants) and why?

Plant Reproduction

Reference Chart

UC



An underground stem, usually growing horizontally.

Rhizomes

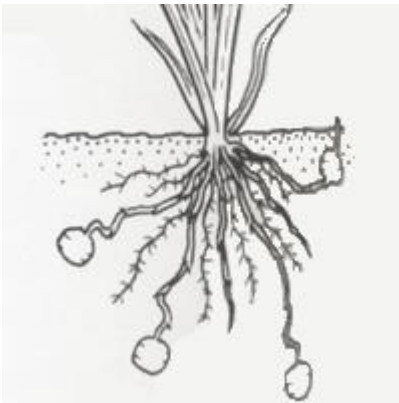
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Above grounds shoot from a plant with the ability to produce roots and new clones of the same plant.

Runners/Stolon

UC



Thickened portions of underground stems with eyes or buds on the side

Tubers

Bryophyllum.com



Small or young plants

Plantlet



Fruit and flowers