Living/Nonliving-General Science Literacy

Summary

Use multiple mini-lessons that utilize math and language standards to explore classification of plants and animals.

Additional Core Ties

English Language Arts Grade 3
Writing Standard 1 b.
English Language Arts Grade 3
Writing Standard 2 b.
English Language Arts Grade 3
Writing Standard 2 d.
English Language Arts Grade 4
Writing Standard 1 b.
English Language Arts Grade 4
Writing Standard 2 b.
English Language Arts Grade 4
Writing Standard 3 a.
Mathematics Grade 3
Strand: MEASUREMENT AND DATA (3.MD) Standard 3.MD.3
Mathematics Grade 4
Strand: OPERATIONS AND ALGEBRAIC THINKING (4.OA) Standard 4.OA.5

Time Frame

1 class periods of 45 minutes each

Group Size

Large Groups

Materials

- Petri dish (top or bottom)
- Construction paper
- Duco® cement modeling glue - must be this brand (order online from Flinn Scientific)
- Overhead projector
- Wood pencil
- Tap water
- Pencil sharpener or knife to make shavings
- 6-8 group sets of leaves (actual or cut out pictures)
- Multiple animals (using smart board activity or cut out animals)
- Graph layout

Background for Teachers

3rd Grade
:

- Classify
- Living

Nonliving
Organism
Observe

4th Grade
:

- Common plants
  : sagebrush, pinyon pine, Utah juniper, spruce, fir, oak brush, quaking aspen, cottonwood, cattail, bulrush, prickly pear cactus
- Common animals
  : jackrabbit, cottontail rabbit, red fox, coyote, mule deer, elk, moose, cougar, bobcat, deer mouse, kangaroo rat, muskrat, beaver, gopher snake, rattlesnake, lizard, tortoise, frog, salamander, red--tailed hawk, barn owl, lark, robin, pinyon jay, magpie, crow, trout, catfish, carp, grasshopper, ant, moth, butterfly, housefly, bee, wasp, pill bug, millipede

Student Prior Knowledge

Simple animal characteristics. Simple plant characteristics. Knowledge of what makes living things.

Intended Learning Outcomes

1. Use Science Process and Thinking Skills
a. Observe simple objects and patterns and report their observations.
c. Make simple predictions and inferences based upon observations.
d. Compare things and events.
g. Develop and use simple classification systems.
h. Use observations to construct a reasonable explanation.
4. Communicate Effectively Using Science Language and Reasoning
b. Report observation with pictures, sentences, and models.
c. c. Use scientific language appropriate to grade level in oral and written communication.

Instructional Procedures

Living Characteristics Section

Place one-half of a Petri dish on an overhead projector.
Fill the Petri dish about one-half full with tap water.
Release a "critter" into the Petri dish by adding one small drop of modeling glue to the surface of the water. (Using a eye dropper to dispense the glue will hide the source of the "critters" from the students.)
Prepare some "critter food" ahead of time so that students will not be aware of the actual source of the food. Make the food by shaving small particles of wood and graphite from the tip of a wood pencil. Sprinkle a small amount near the "critter" during the demonstration.
The "critter" should start to move in an amoeboid fashion. It will move toward the wood shavings and "eat" them.
Add additional "critters" and watch them interact with each other.
When the "critters" stop moving and "die," shut off the projector and discuss what has been observed. Consider all the behaviors that made the glue monsters seem alive.

Discussion

Questions for background knowledge assessment.

What are the characteristics of life?
What does it mean to be alive?
How do you know if something is alive?
Typical properties or behaviors often considered when analyzing for the presence of life include:

the presence or absence of movement, i.e., independent motion.
a changing shape or other interactions with the surrounding environment.
growth, an increase in size, or the assimilation of materials.
response to a variety of outside stimuli.
breathing, eating, or other evidence of interactions for accumulating materials from the environment.
excretion of waste materials into the environment.
reproduction or replication of the organism. Of course, no one visual observation can serve as proof of a living system.

Classification Section

Have the students try and come up with classification on their own using T charts or venn diagrams of what makes something living?
Ask the students to create a list and write it down on the board. Take the list and put each idea into the following groups. They came up with the list on their own (kind of). These need to be the final characteristics.
Living
Growth
Movement
Reproduction
Non Living No Growth
No Movement on its own
No reproduction
Once the agreed upon characteristics have been determined, provide the graph for them to fill in as their groups on the x axis and how many in each group on the y axis.

After graphed provide sentences why they put a certain thing in their group.
"I put _____ in the _____ group because _____."

Strategies for Diverse Learners

Tactile sorting helpful for kinesthetic learners.
"I put _____ in the _____ group because _____."

Extensions

Sorting handouts in the Materials section of this lesson plan.
Group the leaves/animals into more than 2 groups sub groups.
Create a dichotomous key for these groups.
Living, non-living, dead, three page pamphlet.
Science paparazzi -- Homework picture taking of living and non-living (plants, animals & natural from man made)
Square foot safari -- Measure a square foot and observe, and record how many living and non living things in that area.

Assessment Plan

Graph and sentences justifying their selection of groups and why they put items into groups.

Bibliography

Glue Critters - www.flinnsci.com/Documents/demoPDFs/Biology/BF10227.pdf

Authors

Cara Baldree

Kristen Bonner
Parker Ellison
Brian Everett
Ben Gowans
Maggie Huddleston
Sheila Johnston
Terri Lusk
Alishia Malan
Julianne Paul
Ashley Russon
BARBARA STEVENS
Sarah Young