

Characteristics of Living Things

Summary

This lesson uses Venn diagrams to help students understand the characteristics of living things.

Time Frame

2 class periods of 45 minutes each

Group Size

Small Groups

Life Skills

Thinking & Reasoning, Communication

Materials

String

Stakes or rulers

Background for Teachers

There are six characteristics of living things: growth, cells, movement, respiration, complex chemical reactions, and reproduction.

Complex chemical reactions include many things such as the dissolving and transportation of material throughout a system. These may also include the processes of digestion and metabolism, or the chemical reaction that causes a muscle to contract.

Movement must be self-directed; this would not include the movement of a dead leaf in the wind or the movement that happens on a molecular level. The movement on a molecular level happens because of the energy the item contains.

A Venn diagram is a math diagram that is used to show differences and commonalities between objects. In this lesson two circles are drawn so that they overlap. The place where they overlap is called the intersection and it must contain things that are common between both circles. For example if one circle were labeled 'Desert Animals' and the other 'Bipeds', in the first circle you could list things like tortoise, scorpion, rattlesnake etc. In the second circle you could list things like humans, kangaroos etc. , and in the intersection you could list a roadrunner, because a roadrunner is a desert animal that is also a biped. Writing roadrunner in the circle would not be correct because it belongs to both circles and must be put in the intersection.

Intended Learning Outcomes

Make observations.

Develop and use categories to classify observations.

Understand science concepts and principles.

Identify variables and describe relationships between them.

Construct tables, graphs, charts, diagrams, and models to describe and summarize data.

Instructional Procedures

DAY ONE

1. Have the students answer the following question in their journals: "Is a peach pit a living thing? Why or Why not?"

Give the students four or five minutes then discuss their answers. Accept all answers but try to steer them toward ideas that distinguish between living and non-living. Lead this into a discussion of what the characteristics of living things would be. Help them discover that these characteristics would be respiration, reproduction, complex chemical reactions, growth, cells, and movement.

2. In small groups have the students create a matrix with the characteristics of living things across the top. The following items are listed along the side: rock, wood, frog, leaf, worm, safety pin, cactus, door, paper, grass, tree, elk, T-shirt, tennis shoe, bicycle, car, human, bacteria, book, and water. Have the students fill out the matrix, putting x in the columns of characteristics exhibited.

3. After giving the students time to finish their matrix, discuss any gray areas with them. For instance: do rocks move? Gravity certainly moves them and earthquakes move them, but this movement is not self-directed. Do rocks grow? Sedimentary rocks and crystalline rocks do increase in size. You might want to take the time to decide what definition of growth you want to use. Is growth an increase in cells, and an increase in size? Could it be one or the other? If you choose to say it could be either then the other items in the matrix will rule a rock out as being a living thing. Even if you do decide it grows it won't have all six characteristics.

There are some great discussion items here. Don't stress right or wrong answers but the thinking process, and the backing up of opinions. If you think a rock grows what do you have to back that up with?

Remind them throughout this discussion that a living thing must have all six characteristics.

4. CLOSURE DAY ONE: Reiterate that in order to tell if something is living or non-living that they must exhibit all 6 characteristics. Have the students make two lists on their paper, 'Living', and 'Non-Living'. They are to put the items from the matrix in the appropriate column.

Have them hand in their matrices and lists. Check them for understanding of the day's concepts.

DAY TWO

The students are going to look at sectioned areas around the school and look in these sections for living and non-living items. Go around the outside of your school with twine and wooden stakes or rulers and section off several areas. Create the same amount of sections as groups of students. Try to include a variety of objects like pavement, fences, grass, bug life, rocks, trees, flowers, etc. The sections don't have to contain the same things.

1. Before leaving the classroom, have students draw a Venn diagram of two circles. The circles are to be labeled 'Living' and 'Non-Living'. Then take them outside and assign each group a section to study.

2. On the back of the diagram have the students list the different items they find in their sections, then place these items in the appropriate circles on the front.

3. Where the two diagrams intersect students will place the items that were once living but are now non-living, like sticks, dry grass etc.

Strategies for Diverse Learners

Since the students are working in groups, those students who may have been struggling either with the concepts or the writing can get help from the group (some of this may need to be arranged ahead of time). Talk with one of the students who struggles prior to the discussion and help them solidify an idea that you want brought out in the discussion. You can then call on this student for input.

Some students may need you to give them the matrix so they can fill it in.

Assessment Plan

Assess two parts of this lesson:

How carefully the students are making observations

The Venn diagram that they create

Use the assessment rubric to assess their work.

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