



Is it **Living** or **Non-Living**?

Grade: K

Subject Areas: Life Science, Earth science, Social Science, Language Arts

Skills: classifying, collecting, describing, identifying, observing, writing

Duration: 1-2 hours

Connections: plants and animals, rocks, technology

Vocabulary

living things

cells

microscopic

dormant

living

non-living

grow

life

reproduce

Objective:

Students will distinguish between living and non-living things through discussion, hands-on investigations and pictures.

Materials

- artificial fern or plant
- a living plant (ideally similar to the artificial one)
- online computer or pictures
- computer connected to a screen for viewing video
- student worksheet
- book
- bean seeds
- potting soil
- paper cups
- permanent markers
- pencils
- a large area in front of a window or a greenhouse
- watering can

Standards

Strands: Excellence in Environmental Education Guidelines

Strand 1 — Questioning and Analysis Skills: B) Designing investigations:

Learners are able to design simple investigations.

E) Organizing information: Learners are able to describe data and organize information to search for relationships and patterns concerning the environment and environmental topics

Strand 2.2 — The Living Environment: D) Flow of matter and energy:

Learners know that living things need some source of energy to live and grow.

California State Educational Standards:

Life Sciences 2a: Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).

Life Sciences 2b: Students know stories sometimes give plants and animals attributes they do not really have.

Investigation and Experimentation 4e: Students communicate observations orally and through drawings.

Background

Describing Life

Often times, it is much easier for someone to detect if something is dead compared to something alive. Inanimate objects like clouds might share some characteristics of life, but are they truly alive? Seeds are the embryos of plants and fertilized eggs are the embryos of animals. Can a mere glance at a seed or an egg reveal if they are alive or not? Assuming they are fresh, presumably both have the potential to **grow**, develop and mature if given the correct conditions. In other words, both may be viable, however, if left ignored they could easily die.

There are several characteristics used to define whether something is alive or not. **Living things** need to be able to grow and reproduce through biological processes; they need to utilize energy and transform it; they need to be able to respond to stimuli and adapt to their surroundings over time, and every living thing is highly organized and is made of one or more cells.

Cells are the basic functioning unit of any organism. Sometimes life is very tiny because it is made of only one or two cells. As a matter of fact, there are tons of living things all over the place that we cannot see because they are **microscopic** or too small to see. They live in our carpet, they live in our food (e.g. yogurt, yeast, miso, etc.) - they even live on and in us. In fact, there is no simple definition for life. However we can classify objects as living or non-living.

It is not always clear to children whether something is alive or not especially, something like fire. Fire

can multiply, and it definitely responds to stimuli. If you blow on a flame, it moves. It is constantly changing depending on its surroundings. Often, in literature, fire will be describe as “alive”, and early on children are frequently told that fire is one of the basic elements. Fire has no cellular structure and it certainly doesn’t reproduce through biological means. Fire is not considered a living thing.

On the other hand, living things can appear dead or **non-living**. Plants are good examples of this because changes, like movement, tend to happen slowly. You can kick a tree

and it doesn’t flinch. You can scratch it, tear it, climb it, and poke it, yet it just sits there. Only when one becomes informed about the characteristics of life can one begin to get a clearer definition for life. Plants are made of cells, they **reproduce**, they utilize and transform energy and they adapt to their surroundings over time. Once something stops reproducing and repairing new cells it has died unless the condition is temporary such as in the case of hibernation or **dormancy**.

Animals are much easier to classify as living or dead usually. They swim, play, breath, and jump. They more

Local Connection

A good place to view bones, fossils, and preserved specimens is the HSU Natural History Museum. The museum is managed through the Humboldt Science and Mathematics Center, home of the Redwood Science Project. It offers both the out-of-town visitor as well as a local resident an amazing array of exhibits including a walk-through-time by well displayed fossil specimens, a cut-away view of a working bee hive, and a video on the amazing coast redwoods, the tallest trees in the world. Within the museum is a myriad of educational toys and games too. Kids love to visit here.

When school groups visit the museum, students participate in grade level specific, thematic units based on content standards. Periodic professional development opportunities are available for teachers and easy to use curriculum boxes are available for check out. Teachers can easily arrange a field trip to the museum for a small fee by filling out an online application. (See the museum’s website: <http://www.humboldt.edu/natmus> and click on the educators link). Several pre or post lessons are available online as well that can be use to reinforce learning opportunities. If a field trip is not possible, several virtual tours and natural history links are available online for teachers and their students.

In addition, the museum offers summer classes for youth, weekend youth workshops, as well as lectures and workshops for adults. After visitors learn about the amazing wonders of the natural world inside, the museum hopes to inspire people to go outside and explore the real outdoors for themselves.

often than not respond quickly to a good poke by curling up, swimming away, or trotting off. However, you cannot always count on this. Adaptations of some animals mimic death temporarily as in playing dead or undergoing hibernation. There are many animals that look and behave more like plants too. Coral and sponges are true animals and yet you usually won't get a response by poking them.

When first introducing the characteristics of **life**, it is important to clarify whether something is alive now, or used to be alive. For instance, a stick of wood, is most likely not alive now, but it did come from a living plant. However, if there is lichen growing on the stick, then the lichen may still be alive. You can see how this inquiry can be complicated. The same thing applies to fruits and vegetables, feathers and leather, and a host of other objects.

For simplification purposes, if something used to be alive it came from a living thing, and so is classified as living. In contrast, if it has never been alive or did not come from something once living, then it is non-living.

Nature's Life Lessons

Humans have always looked to our fellow plants and animals for innovations. We have duplicated patterns and behaviors to suit our needs in the form of technology. Today more than ever, technology strives to duplicate the complexities of living matter. Artificial heart transplants are now well known. People decorate their homes and yards with artificial plants and animals, including house plants that look so realistic even a touch won't tell you whether they are real or not. Why get a fish tank when you can get a computer screen that looks and acts

like the real thing without the mess? Our phones and computers have human-like voices and we make dolls that actually urinate. The military uses look-alike buzzing insects that are really cameras for reconnaissance purposes. Soon cars and planes will be piloted without people. Human-like robots will be performing mundane chores and who knows what else.

The line between living and non-living becomes harder to distinguish as technology advances. Despite these advances, we will always be dependent upon the natural cycles of life and death. It is through the both living and non-living things that we are supported and enriched.

Activity 1: Defining Life

Preparation

Make sure you have pictures or a working computer to show pictures of living and non-living things. Before beginning, find a suitable place on campus for exploration purposes. If the weather is too severe, have zipper bags containing living and non-living items ready to go. Some examples to include are: a stick, a leaf, a rock, a feather, a pencil, a penny, a marble, and a paperclip.

Procedure

1. Gather the students around into a common area. Hold up an artificial plant and a living plant. Begin to discuss the differences between living and non-living things.

- *Are these two plants the same?*
- *What is different about these two plants?*
- *Do you need to water both of them?*
- *Will both of these plants grow?*
- *What else is different about these two plants?*
- *What sorts of things do living things do?*
- *How do you know if something is alive or not?*

2. Repeat and write the words down that describe living things. Next, show the students pictures of living and non-living things. It is recommended that you show a quick time video about 4 minutes long called "Is It Alive" available at Teacher Domain: <http://www.teachersdomain.org/resource/tdco2.sci.life.colt.alive/>. The list of living things on this video are as follows: ice, cell, river, seed, cloud, clock, coral, fire, bubbles, chick, cars, and jellyfish. An option is to show the video twice. Once all the way through and then a second time pausing at various examples for further discussion. An option is to read a book on the difference between living and non-living things.

Materials

- artificial fern or plant
- a living plant (ideally similar to the artificial one)
- online computer or pictures
- computer connected to a screen for viewing video
- student worksheet (optional)
- book

3. The main points that should be emphasized whether showing a video or reading a book are: living things need food and water, living things need air, living things grow, living things reproduce, and living things are made of cells. Remember to keep it simple.

4. Next, prepare to take the students on an outside exploration. Clearly state some strict outside rules. Tell the student that they will try to find two objects that are living (or once living) and two objects that are non-living once they are outside. The amount can be altered as needed.

5. Have the students classify their objects back in the classroom in groups of 4-5 students as living and non-living by placing them on the correct word (see attached). This can also be done outside in a comfortable area. Assist where needed. Select a few items for discussion and review purposes. Make sure the students wash their hands afterwards. A reinforcement worksheet for classification is also available (see attachment). *Note: Lesson 2 requires that the teacher continue with the lesson for 1-2 weeks.*



Activity 2: Is This Seed Alive?

Preparation

Depending on whether this activity will be done inside or outside, it is optional to have either the students or adults measure the soil into each cup. Poke a hole in the bottom of the cup. Pre-measure the soil into each cup (one per student) so that it is 1 inch below the top after being pressed down firmly. Soil, once watered, will sink down a little.

Procedure

1. Explain to the students that it is not always easy to tell if something is alive or not. Often, people need to test an object like a seed. They will do each experiment to see if a seed is alive or not.
2. Have someone label their cups by name. Model the procedure first. Take your pencil and make a hole about 2 cm deep (just about 1 inch). Next place a bean seed in the hole and gently cover it with some soil. It should be twice as deep as it is big.
3. Water the seed generously (an adult should do this to make sure the soil is saturated). Explain to them that their seed will have the best chance if they provide it what it needs to grow.
4. Place the planted seeds in a sunny window. Continue to water and monitor for the next 2-3 weeks (teacher's consent needed).

Materials

- bean seeds
- potting soil
- paper cups
- permanent markers
- pencils
- a large area in front of a window or a greenhouse
- watering can

- *Are these seeds alive?*
- *How can we find out?*
- *What do living things need to survive. (soil, air, water, sunlight)*



Extensions

- Use the growth of seeds to introduce plant science (roots, shoots, leaves and flowers)
- Have the students act out a living or non living thing while others guess what they are.
- Read a story about death, decay and new life.
- Continue connection to living and non-living things through weather.
- Share a story that shows non-living things with attributes they don't really have.
- Bring a live animal into the classroom.

References

Humboldt State University, Natural History Museum, <http://www.humboldt.edu/natmus/>, 2011
Is It Alive? http://www.afsc.k12.ar.us/pages/uploaded_files/Is%20It%20Alive%20Lesson.pdf
The Definition of Life: http://academic.wsc.edu/mathsci/hammer_m/life.htm

Name: _____

Date: _____

Living or Non-Living?

Do I...

	need food or water?	need air?	grow?	reproduce young?	Am I living?
	<input type="checkbox"/> yes <input type="checkbox"/> no				
	<input type="checkbox"/> yes <input type="checkbox"/> no				
	<input type="checkbox"/> yes <input type="checkbox"/> no				
	<input type="checkbox"/> yes <input type="checkbox"/> no				
	<input type="checkbox"/> yes <input type="checkbox"/> no				

Name: _____

Date: _____

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