Grade Level: K-2
Time Estimate: 1-2 days

LIVING AND NON-LIVING THINGS / INSTRUCTOR INFO

Summary

This lesson includes vocabulary, content, and hands-on activities to help students learn the characteristics of both living things and non-living things. Students will be able to distinguish the two based on those characteristics.

Part 1. Introduction.
Part 2. Characteristics of Living and Non-Living Things
Part 3. Review
Activity 1. Outside Observations
Activity 2. Picture Classification

Goals & Objectives

The students will:
• Learn the characteristics of living and non-living things.
• Learn how to differentiate between living and non-living things.
• Collect evidence and use newly learned information to decide whether something is living or non-living.

Helpful Tips

1. The content in this lesson is related to OCEARCH and the Global Shark Tracker. Spend a few minutes getting familiar with the website and the tracker if you have not done so already. The Global Shark Tracker is also available as an app for iPhone and Android.
2. This lesson plan is designed to be adaptable to suit your specific needs. Use the entire lesson plan or just parts of it. This material can be expanded to be an entire unit or condensed for just one day in the classroom.
3. Vocabulary words will be underlined as they appear in the lesson plan. A complete list of vocabulary words is included as well.
4. Answers to questions and prompts for discussions will appear in italics.
5. Optional activities and content (side notes) will appear in a box. Use these to enhance your lesson and adapt it to suit your needs!
6. Have questions for OCEARCH Expedition Leader, Chris Fischer? Email info@OCEARCH.org to schedule a Skype session and let your students/child talk directly to Chris and the OCEARCH crew!
7. Email all questions about this lesson to info@OCEARCH.org

// STANDARDS

This lesson aligns with the following TEKS:
Grade K Science: 9A, 9B
Grade 1 Science: 1D
Grade 2 Science: 9A

This lesson aligns with the following Next Generation Science Standards:
K-ESS3-1 Earth and Human Activity
Science and Engineering Practice
Developing and Using Models
• Modeling in K-2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete events or design solutions. Using a model to represent relationships in the natural world.

ESS3.A: Natural Resources
• Living things need water, air, and resources from that land, and they live in places that have the things they need, Humans use natural resources for everything they do.

Crosscutting Concepts
Systems and System Models
• Systems in the natural and designed world have parts that work together.

STEM
This lesson plan aims to assist teachers in implementing a STEM-based program into their classroom while inspiring the next generation of explorers, scientists, and stewards of the ocean. Based on real science and the Global Shark Tracker™, this lesson is intended to promote environmental awareness and to prepare students for STEM careers.

Grade Level: K-2

LIVING AND NON-LIVING THINGS / LESSON PLAN

PART 1. INTRODUCTION **5-10 mins**

In science, a living thing is anything that is or has ever been alive. This means that even dead things are classified as living things because they were alive at one point. A non-living thing is anything that is not now nor has ever been alive.

Ask the students to give examples of living thing as you record their answers on the board under the heading, "Living". Avoid telling students the correct answers and record incorrect answers as well so that the class can revisit them later to review and understand how they should have been classified. Now, ask the students to give examples of non-living things as you record their answers on the board under the heading, "Non-Living". Again, record incorrect answers as well. We will revisit them at the end of the lesson.

Now that you have your list of living and non-living things, have a short discussion about the characteristics that make something a living or a non-living thing. What makes living things different from non-living things?

PART 2. CHARACTERISTICS OF LIVING THINGS AND NON-LIVING THINGS **15-20 mins**

All living things have the same seven characteristics. Some non-living things may have one or two of these characteristics, but not all. For something to be living it has to have *all* seven characteristics of a living thing. We will use a shark (living thing) and a beach ball (non-living thing) as examples as we dive further into each of these characteristics.

Feeding
All living things require substance(s) found in their environment in order to obtain energy, to grow, and to stay healthy. This is typically done by feeding. Sharks feed on various types of food for energy - fish, marine mammals, sea turtles, sea birds, and even zooplankton. A beach ball does not feed for energy because it is non-living.

Breathing
All living things exchange gases with their environment in order to stay alive. Plants "breathe" carbon dioxide from the atmosphere and release oxygen. Humans breathe oxygen and release carbon dioxide. Sharks can breathe even though they live underwater! They have special organs called gills that extract oxygen from the water. A beach ball, however, cannot breathe.

Excretion
All living things must remove, or excrete, waste from their bodies. After digesting their food, sharks excrete waste into the open ocean. Beach balls do not produce waste and therefore do not excrete waste.

Movement
All living things have the ability to move on their own. The obvious forms of movement include swimming (like a shark!), walking, climbing, slithering, etc. But this characteristic also includes small, less obvious movements such as a sunflower that turns to face the sun or a Venus flytrap that closes its leaves to catch fruit flies (Figure 1)! A beach ball can move, but not on its own! Children can kick it or throw it. The wind or water can push it around too, but it cannot move on its own.

Reaction
All living things react either voluntarily or involuntarily to changes in its environment (light, temperature, touch, sounds, etc.). Sharks react in many different ways to their environment. They may be attracted to the sound of an injured fish (easy prey). Some sharks migrate to warmer waters during the winter to avoid cold water. A beach ball, however, does not react to its environment.

Reproduction
All living things reproduce. Plants make seeds that grow into new plants. Animals give birth to young. Did you know that some sharks lay eggs? A shark egg is called a "mermaid's purse" and looks very different from a chicken egg. A beach ball does not have the ability to reproduce because it is a non-living thing.

Growth
All living things grow from a smaller or simpler version of themselves. Growth requires energy from feeding. From the moment they are born, sharks begin to slowly grow into adults. Did you know that great white sharks average 1.5 meters (5 feet) in length at birth?! Adult great white sharks average 4.6 meters (15 feet) in length depending on gender, age, diet, and health. A beach ball grows when it is inflated. But because it lacks all other characteristics of a living thing, it is still classified as non-living.

PART 3. REVIEW **10-15 mins**

Now that the students know the seven characteristics that describe a living thing, let's go back to their list on the board and review their examples. Go through each example again to confirm that it was originally placed in the correct category. If there is a disagreement on the classification of a thing, the students should discuss the thing's characteristics and decide as a class what the correct answer is.

Grade Level: K-2
Time Estimate: 20 - 30 mins

LIVING AND NON-LIVING THINGS / ACTIVITY 1. OUTSIDE OBSERVATIONS

INTRODUCTION

All things can be described as living or non-living based on its characteristics. Now that students understand the difference between living and non-living things, they will head outside to observe different things and determine if they are living or non-living.

MATERIALS

- Notebooks
- Pencil
- Flashlights (optional)
- Binoculars (optional)
- Magnifying glasses (optional)

INSTRUCTIONS

Go on an outside adventure with your students! Make sure students have their notebooks and a pencil so that they can record their observations.

* If there is time before going outside, you may prepare or have the students prepare a simple table in their notebooks to help them classify the things that they find on their adventure. The table should include space to list the things on the left and then columns to the right for each characteristic of life. Students can then record their findings and have a reminder of what characteristics they are looking for. Here is an example:

	FEEDS	BREATHS	EXCRETES	MOVES	REACTS	REPRODUCES	GROWS
1.							
2.							
3.							

1. Once outside, either pair students up or split into small groups.

2. Designate a safe area for the students to explore and review any rules for safety.

3. Give students 10-20 minutes to explore the area. While they explore, they should select different things in the area to evaluate (rocks, plants, sidewalks, trees, insects, playground equipment, etc.). They should write each thing they decide to evaluate in their notebooks. Then the pair/group should determine whether or not the thing is living or non-living based on its characteristics. After they have evaluated one thing, they should go on to select another thing to evaluate and then another until time is up.

4. When you return to the classroom, have the students should present their findings to the class. Maybe one pair/group could not figure out how to classify something and the class can figure out the answer together!

Grade Level: K-2
Time Estimate: 20 - 30 mins

LIVING AND NON-LIVING THINGS / ACTIVITY 2. PICTURE CLASSIFICATION

INTRODUCTION

In this lesson, students have learned the characteristics of both living and non-living things. To help demonstrate this knowledge, students will now classify a variety of things as living or non-living by viewing pictures and sorting them into categories. Students will present their findings to the class or to small groups in order to verify they have classified correctly.

Students may work individually or in small groups. Younger students should be assisted with scissors and glue.

MATERIALS

- Assorted kid-friendly magazines, catalogs, and/or newspaper.
- Poster board
- Markers
- Scissors
- Glue or tape

INSTRUCTIONS

1. Give each student or group a poster board.

2. Students should write their name(s) on the back of the poster.

3. On the front of the poster, students should draw a line straight down the middle to divide the poster in half.

4. One side of the poster should be titled “Living” and the other “Non-Living”.

5. Give students 10-20 minutes to (carefully) cut out an assortment of images from the magazines, catalogs, and newspapers. They should choose at least 10 pictures.

6. After collecting their images, students should now sort them into each category on the poster. Once they are sure they have everything sorted correctly, they should glue the pictures down in their categories. *For a fun twist, have students/groups switch their collection of pictures *before* sorting them. Then each student/group will have to sort pictures that they didn’t choose and are less familiar with.

7. Once the posters are complete, the students should present their findings to the class. If there is a disagreement on the classification of a thing, the students should discuss the thing’s characteristics and decide as a class what the correct answer is.