Is It Alive? Teacher Instructions

Overview:

Students will compare living and non-living objects to begin a discussion of how to define life. After listing some basic "criteria for life," students will then explore the properties of three mystery samples and try to find out which one contains life.

Scientists define life in different ways, but agree that certain characteristics are common to living things. These are the ability to use energy, grow, and reproduce.

Part 1—Comparing Living and Non-living Things

Materials:
Various items, some living (or once living things) and non-living things, for students to compare and contrast.

Ideas:
Wax fruit vs. real fruit
Plant vs. silk plants
Insects vs. plastic bugs

Discuss with your students what they believe are the Characteristics of Life. Create a list that will be used for Part 2.

Part 2 – Is it Alive?

Do not let groups know what is in the samples!!
Materials for each group:

3 containers
warm/hot tap water
clean sand
sugar
dry yeast
fizzing antacid tablet
hand lenses
spoons
data sheet: *Is it Alive*?

Set Up:
1. Prepare the samples for each group as listed below:

Jar	Sand	Other Ingredients
#1	3 tablespoons	None
#2	3 tablespoons	½ pkg. Active Dry Yeast
#3	3 tablespoons	1 fizzing antacid tablet, crushed

2. Have a small container or several packets of sugar ready for each group.

3. Have a container of warm/hot water for each group, but do not pass it out to the groups until they need it. Note: Test the water temperature before the activity to make sure it will activate the yeast.

4. Set out hand lenses, spoons, data logs, and pencils for each group.

Procedure:

Follow the procedure as listed on the student page "Is it Alive?"
Ask the students to observe the mystery samples as they follow the prompts on their worksheet. They may use all of their senses except taste!

Encourage them to remove a small amount of the sample to look at closely with the hand lenses.

After they have added the sugar and made observations, pass out the hot water and instruct them to use the spoon to add a small amount of water to each sample and observe the samples again and write their observations on their worksheets.

What to Expect

Jar #1: no activity
Jar #2: will show some activity after about 5 minutes, and will continue to bubble
Jar #3: will fizz a lot at first, and then it will slow down and stop

Discuss which sample the students believe contains life and why they think so. Point out that sometimes we cannot see living things, but we can observe evidence of their presence.

Reveal the contents of the samples. Discuss the difference between the activity of the antacid tablet (chemical reaction with the water) versus the activity with the yeast, which should continue as long as there is a food source.

Adapted from:

https://marsed.asu.edu/sites/default/files/stem_resources/Is_it_Alive_MS_Lesson_2_16.pdf

Is it Alive?

Name: _____

1.Describe each sample. Based on your observation, do any of the samples contain living things?

Sample #1	Sample #2	Sample #3

2. Add one teaspoon of sugar to each container. Sugar is a food source.

3. Pour hot water into each sample container.

4.Observe the samples. Look for signs of life.

5. Describe each sample again now that you have poured water on them.

Sample #1	Sample #2	Sample #3

6. Use the list of Characteristics of Life that the class developed earlier to determine whether there is something alive in any of the jars.

- Is there anything alive in any of the jars?

- Why do you think so?

7. Which characteristics of life were most important in helping you draw your conclusions?