

NASA Astronomy & Space Science
Lesson Implementation and Reflection

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Description

I chose to implement the **LOOKING FOR LIFE** activity from the JPL Education Database:

<https://www.jpl.nasa.gov/edu/teach/activity/looking-for-life/>

This lesson involves multiple activities designed to get students thinking about life - what are the criteria for life and how can you recognize when something is alive. The first activity asks students to investigate living things around them and to think about what they do that makes them alive. Each student investigates 5 different living things and develops some criteria they follow that shows they are alive. The class then shares their work and the teacher helps them come to somewhat of a consensus in regards to their criteria for life. In the process of this, they try to steer the class to the five criteria of life that are shared in the resource:

- Locomotion
- Metabolic processes that show chemical exchanges,
 - which may be detected in some sort of respiration, or exchange of gases or solid materials
- Some type of reproduction, replication or cell division
- Growth
- Reaction to stimuli

The students then analyze their original organisms to see if they follow these criteria.

The second activity involves a simple lab experience. Students are provided 3 “soil samples” and they are tasked to determine which sample has a living thing in it. The samples are prepared by the teacher and are all based on sand. The teacher adds sugar to Sample A, yeast to Sample B and effervescent tabs to Sample C. Students make observations of the samples before and after the teacher adds warm water to the samples. Based on their observations, students then apply the criteria of life to the samples to determine which had life in it. During a debrief period, the teacher can discuss how the yeast in Sample B illustrates the criteria, while the reaction in Sample C does not.

STUDENT ARTIFACTS:

The first artifact on the right is the Criteria for Life Log Chart completed AFTER adapted for 8th grade (as explained in next section).

The image below shows the “Soil Samples” after warm water was added to the mixtures.



FOR LIFE CHART

Fill in Criteria after the class has made observations and the teacher has grouped the observations.

Living Organism	Motion/ Moving Criteria	Metabolism Criteria	Reproduction Criteria	Growth Criteria	Reaction to Stimuli Criteria
Person	Walks Runs	Eats meat	Makes babies	Gets taller	Are pupils getting bigger or smaller when light is turned off?
Deer	Licks their nose	Eats Plants	Makes fawns	Gets taller	Smells humans and runs away
Rabbit	Kicks their feet on the ground	Eat Carrots	Makes bunnies	Gets taller	Hears loud noises and gets scared
Maple Tree	grows	Photosynthesis	Makes seeds	Gets taller	When it gets to be winter the leaves fall
Oak Tree	grows	Photosynthesis	Makes seed	Gets taller	When it gets winter out the leaves fall off

SUMMARY OF IMPLEMENTATION

Overall, this lesson went pretty well, although it did not utilize “authentic space data”. I chose this because, as I will explain in more detail, it fit into my current unit and activities. As this lesson is marked for use with grades 4-8, I approached it knowing I would probably want to manipulate the activities in some way to ramp it up for my 8th grade Life Science classes.

For the past five years, I have had my students attempt a “BioBlitz” of our campus. We take pictures and identify as many living things on our school grounds as we can. As I had already started this activity before I found this resource, I implemented the “Criteria for Life Log Chart” a little differently. Instead of going outside specifically for the chart, we used the pictures they had already taken, or a living thing that they wanted to investigate. I had them share their original criteria via a Google Form and we discussed categories that could be made from their ideas, steering them towards the list provided in the lesson. I then shared the “official” criteria and had the students label the Criteria Log with these. I then asked the students to explain how their organisms expressed the various criteria (as shown in the student artifact).

The next day we completed the Soil Sample investigation. Again, I added in some twists. Prior to pouring the water on the samples, I made sure that each student made a prediction about which soil sample they thought would react when the water was added on “Data Chart I”. I also asked them to make a Claim-Evidence-Reasoning statement on the back of “Data Chart II” after the water was added in which they stated which sample had life in it based on their observations and the criteria. I am trying to introduce this line of thinking employed by the NGSS and it seemed to fit well - the scaffold I provided was:

I think Sample ___ had life because ___ (this happened) ___ and this means ___ (statement about criteria) .

I also am introducing lab reports, so I have had the students write up a basic report to shared their experience.