

Essential Question: What are the characteristics & structure of living things?



Oxytricha sp.

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Activity 1 - The Characteristics of Living Things

Starring

Paramecium, Amoeba and Euglena



Amoeba sp.

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Purpose: I am able to identify if an organism is living by using the characteristics of living things.

Background: *Living things all have certain characteristics in common:* This applies to both single cell creatures (unicellular) and multicellular organisms like yourself.

Most living organisms on Earth are made of only one cell. These one celled, *or unicellular*, organisms (including bacteria, plants, fungi and animals) have the same characteristics of living things that you have! It is simply amazing that a one celled organism can do all the basic life functions you can do!..... But wait a minute, let's put this in perspective.... If single cells organisms do it all with one cell, let's find out how many cells it takes a human to live.

Please complete the questions below using complete sentence that reflecting the question.



Human Brain Cell

Introduction: Let's get started by gathering your team and viewing a [vclip](#) about this very topic! (After viewing please move on the sections below.)

<https://www.youtube.com/watch?v=juxLuo-sH6M&index=15&list=PLISBHwJJXpn2bmLjfiShKclHpBPcov240>

1. How many cells does a human actually have?

Do a Google search for "How many cells are in the human body?" Find 2-3 science-oriented site and write down the range of answers you find.

1. _____

.... In reality this isn't the whole answer because there are lots more cells in a human body. However they aren't yours! These are one celled bacteria, yeast and fungi.

2. Do another Google search. This time for " How many foreign cells are there on the human body?" (You may find a range of answers, so write the high and low range that you discover....) *Once again, look for a good site then write down the answers you find.*

Microbes aren't on our bodies just for the ride. We have a special relationship with them. We give them a place to live - they help keep us alive by getting vitamins & nutrients from food, and do many other tasks.

Student Review: 1-Below Standard, 2-Approaching Standard, 3-Standard, 4-Above Standard
Use the scale to evaluate completeness & correctness of the job. Put score, Initial & date in boxes.

Score

Initial/Date

2. _____

As you can see, it takes a lot of different types of cells for a human to function properly. Also that the human body also contains millions of one cell bacteria that are living their lives on and in your body.

Worldwide there are actually billions of one celled living creatures. Each can perform all of life's functions, or Characteristics, that you do, only with a single cell! Let's study these characteristics before moving on.



Beluga Whale and calf

So what are the Characteristics of all Living Things?

Most scientists agree that living things have Seven Characteristics..... but, as always, there are exceptions!

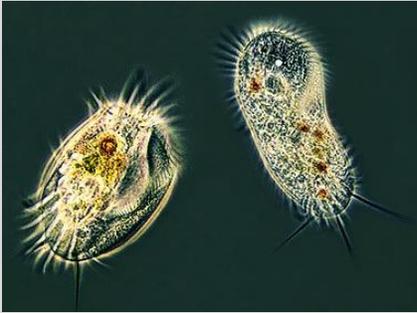
- *Read & think about the list of the 7 characteristics below*
- *Copy the list of 7 characteristics down on an index card(s) so you have easy access to this list to use when determining whether something is living or not.*

All Living Things:

- Are composed of one or more cells, which are the basic unit of life.***
- Are organized to do simple and complex functions***
- Get, store and use energy: (ex: make or take in nutrients, do work, & release waste)***
- Keep proper internal balance (this is called homeostasis)***
- Grow***
- Respond to stimulus (ex: move, defend, flee etc.)***
- Reproduce from preexisting cells and each new cell has its own complete set of DNA.***
- Evolve (adapt to environmental conditions over time.)***

Now you know the Characteristics of Living things! What's next?

You will use this knowledge to look closely at three types of amazing singled cell organisms called **Protists** to see if these organisms have the same characteristics of living things that you do!



Euplotes (left) & Stylonichia (right)

So what is a Protist?

Here's a great [vclip](https://www.youtube.com/watch?v=0-6dzU4gOJo) that will give you a fascinating look at these little organisms!

Let's move on with our studies. Please go to:

["The Smallest Page on the Web"](http://www.microscopy-uk.org.uk/mag/indexmag.html?http://www.microscopy-uk.org.uk/mag/wimsmall/smal1.html)

<http://www.microscopy-uk.org.uk/mag/indexmag.html?http://www.microscopy-uk.org.uk/mag/wimsmall/smal1.html>



Peranema sp.

3. Flagellated Protozoa basics: Protozoa are *single cell organisms that are neither animals, plants, bacteria or fungi.*

Instructions:

- Click to zoom in on the menu.
- Select [Flagellated Protozoa](#):
- Next scroll down to the Euglena section on Flagellated Protozoa page and complete the Data Table below.

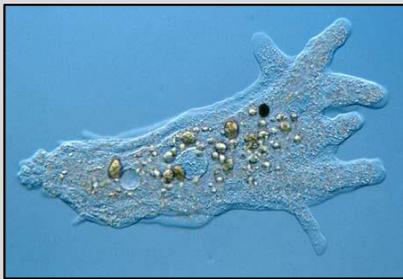
Data Table 1 - The Euglena – Structure and Life Characteristics

Explain what body part the Euglena does to do the following:	Answer	Which Characteristic of Living things does this show?
Store DNA (DNA = genetic material)		
Get energy		
Store energy		
Move (tell two ways)		
Detect light		

Student Review: 1-Below Standard, 2-Approaching Standard, 3-Standard, 4-Above Standard
Use the scale to evaluate completeness & correctness of the job. Put score, Initial & date in boxes.

Score

Initial/Date



Amoeba proteus

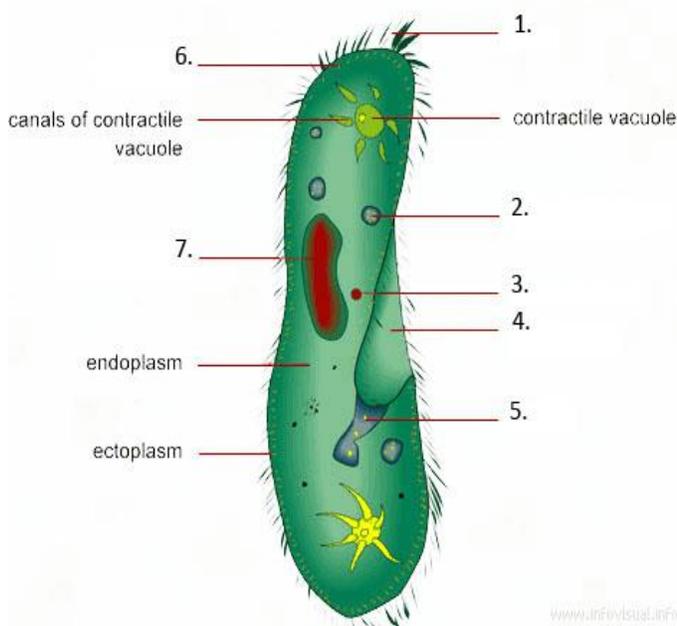
4. Amoebas – a living “blob!”

Go back to the main page and select [Sun animalcules and Amoebas.](#)

Data Table 2 - The Amoeba – Structure and Life Characteristics

Explain what Amoeba uses to do the following:	Structure	Which Characteristic of Living things does this show?
Move		
Capture Prey		
Get rid of extra water to keep internal balance.		
Create more Amoeba		

STRUCTURE OF A PARAMECIUM

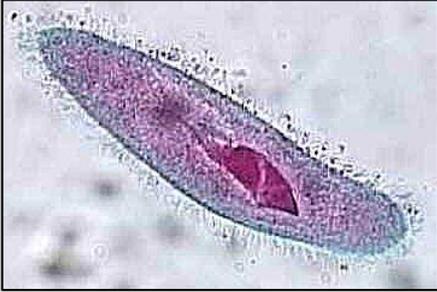


5. Paramecium & the Characteristics of Living Things.

Do Paramecium have all the characteristics of living things?

- Let's start this part of our investigation by looking closely at this one celled organism by identifying the name (structure) and function of some of the key parts of this one celled creature.
 - Go to the [Visual Dictionary](#) and check out a stylized figure of this one celled speedster.
 - The notes on the bottom of the page tell what the Paramecium's different organelles and other parts do.

Instructions: Use the Paramecium diagram & the [Visual Dictionary](#) to complete this Data Table

Data Table 3 – Paramecium Structures and Functions		
Item	Name = Structure => What it is	Function => What it does
1.		
2.		
3.		
4.		
5.		
6.		
7.		
 <p>Paramecium sp. stained</p>		<p>6. Go to the Smallest page on the Web and select Ciliates.</p> <ul style="list-style-type: none"> Now you know some of the Paramecium’s key structures, let’s systematically investigate the Paramecium to see if how this organism has the characteristics of living things. complete the data table below

Data Table 4 – Paramecium Structures that demonstrate the Characteristics of Living Things	
Characteristic of Living Things	Structure
Which parts are used to get energy?	
Get rid of extra water to keep internal balance.	
Which structures are used to store & transport energy through the cell?	

Student Review: 1-Below Standard, 2-Approaching Standard, 3-Standard, 4-Above Standard
Use the scale to evaluate completeness & correctness of the job. Put score, Initial & date in boxes.

Score

Initial/Date

Characteristic of Living Things	Structure
Which structure is used to store DNA? (Genetic material used for heredity & evolution)	
Which structures are used to flee from predators?	
Which parts is/are used to respond & defend from predators?	
Tell the two ways ciliates can use to reproduce & multiply.	a. b.



Its time to just have some fun!

Paramecium sp.

Watch these at least 3 of these Cool Videos of Paramecium in action.

1. [Various Ciliated Protozoa.](#)
2. [Flagellum and cilia movement](#)
2. [Paramecium eating](#)
3. [Paramecium dividing](#)
4. [Paramecium Conjugating \(Trading parts of their DNA!\)](#)
5. [Amoeba eating Paramecium](#)