

Welcome to the Supercharged Science

Biology Course!

You can fill out this worksheet as we go along to get the most out of time together, or you can use it as a review exercise at the end of the course to see where your strengths are.

What we're going to cover today:

- Different fields of Biology:
 - Zoology
 - Biochemistry
 - Molecular Biology
 - Ecology
 - Botany
 - Entomology
 - Astrobiology
- Compound Microscopes
- Classification & Taxonomy
- Birds and flight
- Insect structure and behaviors
- Plant behavior and structure
- Bacteria behaviors
- Photosynthesis and Chemosynthesis
- Properties of light

Do this NOW: Write down two things you want to learn about biology:

Do this NOW: Write down WHY you want to learn about the things you mentioned above. What will it give you, or provide you with, or make possible for you if you now understand these things that you wanted to learn?

IMPORTANT: During this course, you can either fill out the worksheet, OR if that's too stressful or a hassle, just set it aside and fill it out after class is over so you can enjoy watching the class.

Answer key is on the last page, so put it in a place where you won't be tempted to peek at the answers until after you've given it your best shot.

Material List:

- Aquarium-safe pebbles
- Blender
- Calculator
- Carrots
- Chalk Dust
- Clear cup
- Coffee filter or paper towel
- Cool Blue Light Kit*
- Flashlight
- Funnel
- Gold fish or other small fish
- Gummy bears (red and green)
- Index Cards (2)
- Isopropyl alcohol (91%)
- Liquid dish soap
- Needle-nose pliers
- Paperclip
- Pea gravel, sand and soil
- Pencil
- Pie pan
- Plants (radish seeds work well)
- Pond water sample
- Red laser pointer
- Rubber band
- Ruler
- Salt
- Sharp Knife
- Small elodea plant
- String
- Tape
- Two 2-liter soda bottles (empty)
- Water

*This kit is optional. If you'd like to do this experiment, you'll find the *Cool Blue Light Kit* available at Home Training Tools here:

<https://www.homesciencetools.com/cool-blue-light-experiment-kit>

During the Lesson:

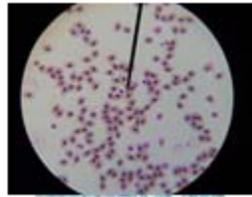
You can look over the worksheet so you know what to listen for as you go through the class with me, or you can go through it along with me during class. OR... flip it over and forget about it and just enjoy the class. When class is over, flip it back over and fill it out and be amazed at how much you've picked up and learned!

1. _____ studies animals in the lab and also in their natural environment.
2. Wildlife biologists study the _____ of the environment on animals.
3. Molecular biologists study _____, do research and perform experiments to solve real world problems.
4. Astrobiologists study _____ on earth and in space.

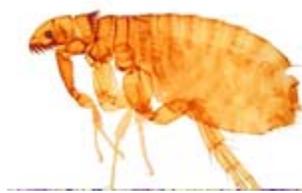
5. What is it?



a. _____



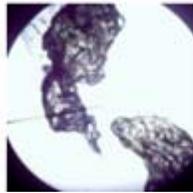
b. _____



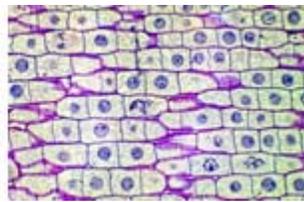
c. _____



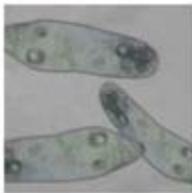
d. _____



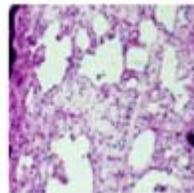
e. _____



f. _____



g. _____



h. _____



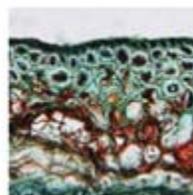
i. _____



j. _____



k. _____



l. _____

6. Entomologists study _____, including appearances and behaviors, and also their environment.
7. Three questions scientists ask:
- a. _____
 - b. How does it work, function, or behave?
 - c. _____
8. Compound _____ are individual visual units put together into a single unit.
9. Scientists study _____ to help them make progress in technology.
10. Four aerodynamic forces of flight are: _____, weight, _____ and drag.

11. Botany (plant biology) studies the nature of _____ and their environment.

12. Sunlight has to go through more _____ at sunrise and sunset.

13. Phototropism describes the way plants grow in _____ to light.

14. Phytochrome is a light-activated _____ in the leaves of plants.

15. Plants can encode, store, and recall _____.

16. Special cells in the root cap contain a starch that is _____ than the rest of the cell, and _____ in a gravitational field.

17. The six kingdoms are: _____, fungi,
_____, archaeobacteria, eubacteria, and
_____.

18. Lenses _____ and distort images to _____
_____ the image.

19. Bioluminescence is the production and emission of _____ by a
living organism.

20. _____ studies nature and how the whole ecosystem works.

21. An ecosystem is a community of _____ living things in their
environment.

22. Plants, algae and certain bacteria convert sunlight into _____ by
photosynthesis.

23. _____ are organisms create _____
for the food chain.

24. _____ is a tiny organism that lives in _____.

Cyanobacteria generate over _____ of the oxygen we breathe.

25. _____ use chemosynthesis to make organic matter in total
_____.

26. (Astrobiologists) use _____ and computers to try to find signs of
life on other planets.

27. Hydrothermal _____ are surrounded by thriving communities of
organisms that _____ from the vents for chemosynthesis.

28. What I didn't know about biology until class today was:

Answer Key

1. Zoologist studies animals in the lab and also in their natural environment.
2. Wildlife biologists study the effect of the environment on animals.
3. Molecular biologists study cells, do research and perform experiments to solve real world problems.
4. Astrobiologists study life on earth and in space.
5. What is it?
 - a. Moth wing
 - b. Frog blood
 - c. Flea from a cat
 - d. Ant
 - e. Sneeze
 - f. Onion cells
 - g. Paramecium (single-cell protist)
 - h. Respiratory tissue sample (like from your lungs)
 - i. Hair growing on a scalp
 - j. Green algae
 - k. Water flea
 - l. Pine wood
6. Entomologists study insects, including appearances and behaviors, and also their environment.
7. Three questions scientists ask:
 - a. What is it?
 - b. How does it work, function, or behave?
 - c. How does it change?
8. Compound eyes are individual visual units put together into a single unit.
9. Scientists study animals to help them make progress in technology.
10. Four aerodynamic forces of flight are: lift, weight, thrust and drag.
11. Botany (plant biology) studies the nature of plants and their environment.
12. Sunlight has to go through more atmosphere at sunrise and sunset.
13. Phototropism describes the way plants grow in response to light.

14. Phytochrome is a light-activated switch in the leaves of plants.
15. Plants can encode, store, and recall information.
16. Special cells in the root cap contain a starch that is denser than the rest of the cell, and sinks in a gravitational field.
17. The six kingdoms are: plants, fungi, animal, archaeobacteria, eubacteria, and protists.
18. Lenses bend and distort images to magnify the image.
19. Bioluminescence is the production and emission of light by a living organism.
20. Ecology studies nature and how the whole ecosystem works.
21. An ecosystem is a community of interacting living things in their environment.
22. Plants, algae and certain bacteria convert sunlight into chemical energy by photosynthesis.
23. Primary producers are organisms create new organic material for the food chain.
24. Phytoplankton is a tiny organism that lives in water. Cyanobacteria generate over 50% of the oxygen we breathe.
25. Bacteria use chemosynthesis to make organic matter in total darkness.
26. (Astrobiologists) use telescopes and computers to try to find signs of life on other planets.
27. Hydrothermal vents are surrounded by thriving communities of organisms that use energy from the vents for chemosynthesis.