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](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, __________________________, archaebacteria, 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, archaeabacteria, 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.