**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period\_\_\_\_\_\_**

**8th Grade End of Year Study Guide**

**Chemistry**

1. How are atoms related to molecules?
2. Has our theory of atomic structure ever changed? If so, why?
3. How many protons, neutrons, and electrons does phosphorous have?

Protons: Neutrons: Electrons:

1. How many protons, neutrons, and electrons does arsenic have?



Protons: Neutrons: Electrons:

1. How many protons, neutrons, and electrons does flourine have?

Protons: Neutrons: Electrons:

1. How many protons, neutrons, and electrons does copper have?



Protons: Neutrons: Electrons:

1. How many protons, neutrons, and electrons does boron have?

Protons: Neutrons: Electrons:

1. How do we decide which substances to use for a particular function?
2. Why do we use rubber for tires?
3. Why do we use diamonds for drill bits?
4. Why do we use helium and not hydrogen in balloons?
5. How could you change a solid to a gas?



1. How could you change a gas to a liquid?
2. How could you change a liquid to a solid?
3. How could you change a liquid to a gas?
4. How are temperature and density related?
5. If you heat up a balloon, what happens to its density?
6. What are 4 phenomena could indicate that a chemical reaction has taken place?
7. What natural resource did your synthetic substance come from?
8. Why is your synthetic material better than the natural material?
9. Draw what a solid, liquid, and gas would look like in a beaker.
10. Which state is generally the most dense and why?
11. 9,756 grams of a substance occupy 35,000 cubic centimeters of space. Calculate the density of the substance.
12. What advantage does a synthetic sweetener like splenda have over a natural sweetener like sugar?
13. Draw a model of a chemical reaction that obeys the law of conservation of mass.
14. If you start out with 100 kilograms of wood and burn it, the ashes only weigh 1.5 kilograms. Where did the other 98.5 kilograms go?
15. Are phase changes chemical changes? Why?

**Physics**

1. How would changing the amplitude change how you see light?
2. How would changing the amplitude change how you hear sound?
3. How would changing the frequency change how you see light?
4. How would changing the frequency change how you hear sound?
5. What factors determine the amount of mechanical kinetic energy a moving object has?
6. What factors determine the amount of gravitational potential energy an object has?
7. Why do you see a red car as red?
8. Why do you see a blue car as blue?
9. How is energy transferred in collisions?
10. How are s waves different than p waves?
11. What does waves refracting mean?
12. What is an example of refraction? (include an example using both sound and light waves)
13. What does waves being transmitted mean?
14. What is an example of waves being transmitted? (include an example using both sound and light waves)
15. What does waves being absorbed mean?
16. What is an example of waves being absorbed? (include an example using both sound and light waves)
17. What does waves reflected mean?
18. What is an example of waves reflecting? (include an example using both sound and light waves)
19. Draw a diagram showing how a light wave would look being reflected, refracted, absorbed, or transmitted when it hits a wall.
20. What is the law of conservation of energy?
21. Explain 2 examples that illustrate the law of conservation of energy.
22. Draw and label a wave with all of its parts.
23. What factor determines the amount of energy in a wave?
24. What is analog technology?
25. What is digital technology?
26. What are some pros and cons about analog and digital technologies?

**Ecology**

1. What is the formula for photosynthesis?
2. What is the formula for cellular respiration?
3. Explain in your own words what photosynthesis is and how it transforms matter.
4. Explain in your own words what cellular respiration is and how it transforms matter.
5. What is the relationship between photosynthesis and cellular respiration?
6. How has photosynthesis changed the Earth?
7. What factors affect the rate of photosynthesis on Earth?
8. How do **all** organisms rely on photosynthesis? Cellular respiration?
9. What are the **producers** in this food web?
10. What are the **consumers** in this food web?
11. Fill in the energy pyramid with the organisms from the food web.⇦
12. What happens to the amount of energy as you travel from the bottom of the energy pyramid to the top?
13. Which organism could you take away from the food web that would cause the biggest change? **Why**?
14. Which organism could you take away from the food web that would cause the smallest change? **Why**?
15. What are some things that could happen if a new organism was introduced to this food web?
16. Why are ecosystems delicate?
17. Draw a graph that shows the levels of CO2 in an ecosystem during the following events:
	1. There are many plants but no animals in the ecosystem for 4 days
	2. On day 5, 1 animal is introduced
	3. On day 6, 20 animals are introduced
	4. On day 10, all of the animals leave

**Environmental Science**

1. What is the definition of a natural resource?
2. Give 10 examples of natural resources
3. Are natural resources evenly distributed on the Earth?
4. What makes natural resources more concentrated in some areas than others?
5. Why is using natural resources a double edged sword? (Why can it be good and bad for us?)
6. What does the word mitigate mean?
7. What does it mean to mitigate the effects of our use of natural resources?
8. Why is mitigating natural resource use important?
9. What has our increased use of fossil fuels done to affect the Earth system?
10. What effect will rising global temperatures have on:
	1. The ocean:
	2. Global sea levels:
	3. Sea and land ice:
11. Where would you be most likely to encounter tornadoes?
12. How would our knowledge about where tornadoes occur change our building practices?
13. What factors make tornadoes more common in some areas?