**8th Grade Science EOG Review Study Guide**

**Properties of Matter:**

1. Define the following:
   1. Matter –
   2. Element –
   3. freezing point –
   4. melting point –
   5. condensation point –
   6. boiling point –
   7. volume –
   8. mass –
   9. compound –
   10. density –
   11. homogeneous mixture –
   12. heterogeneous mixture –
   13. solubility –

↑temperature = increase in solubility of SOLIDS, ↓temperature = decrease in solubility of SOLIDS

↑temperature = decrease in solubility of GASES, ↓temperature = increase in solubility of GASES

* 1. solute –
  2. solvent –
  3. atom –

1. What is the formula for density?
2. How do you calculate the volume of a regular object?
3. List the states of matter in order from least dense to most dense. Draw pictures.
4. The density of Ms. Keener’s necklace is 25 g/cm3. Its mass is 100g. What is the volume of the necklace?
5. Draw and label the phase change graph for water.
6. What happens to temperature during a phase change?
7. What is the density of water? How do you know something is float in water? Sink?
8. Is water an element, compound, or mixture?
9. Which state of matter has a definite shape and volume?

**Chemistry:**

1. An atom of boron with 5 protons, 5 electrons, and 6 neutrons would have an atomic mass of \_\_\_\_\_.
2. What is the central region of the atom called?
3. Draw an atom and label: Proton, neutron, electron, nucleus
4. List the 3 subatomic particles, their location in the atom, their mass, and their charge.
5. What are valence electrons?
6. What is an ion?
7. What is an isotope?
8. Use your periodic table to find the following information about Nitrogen, Carbon, Hydrogen, and Chlorine: number of proton, electrons, neutrons, valence electrons, atomic number, atomic mass.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Element | Protons | Electrons | Neutrons | Valence Electrons | Atomic Number | Atomic Mass |
| Chlorine |  |  |  |  |  |  |
| Hydrogen |  |  |  |  |  |  |
| Carbon |  |  |  |  |  |  |
| Nitrogen |  |  |  |  |  |  |

1. List the families on the periodic table.
2. Name the family that…
   1. tends to lose 1 electron and become a positive ion?
   2. tends to give away 2 electrons when forming compounds?
   3. can give away 4 electrons or steal 4 electrons?
   4. most reactive metals?
   5. most reactive nonmetals?
   6. does not react with other elements?
   7. forms -3 ions in compounds?
3. Where are the metals on the periodic table? Nonmetals? Metalloids?
4. How do you find the number of valence electrons?
5. What is the difference between a homogeneous and heterogeneous mixture?
6. What is the difference between mass and weight?
7. List 3 physical properties that can be used to identify substances.
8. List the 4 indicators of a chemical change.
9. What is a physical change? List 4 examples.
10. What is a chemical change? List 4 examples.
11. What type of change is a change in state of matter?
12. What is a chemical equation? Write a chemical equation and label the reactants and products.
13. What is a chemical formula? List 2 examples of chemical formulas and label the element symbol and subscript.
14. What is an acid? List the properties.
15. What is a base? List the properties.
16. Draw and label a pH scale with 2 acids, 2 bases, and a neutral substance.
17. What is the law of conservation of matter?
18. Count the atoms. Is mass conserved?

**3 Li(OH) +  Al(PO4) ---->  Li3(PO4) + Al(OH)3**

**Energy:**

1. Compare and contrast plant and animal cells.
2. Why do cells have organelles?
3. What is photosynthesis? Write and label the BALANCED chemical equation (reactants, products, etc.)
4. Where do plants get the energy they need for photosynthesis?
5. What is the difference between eukaryotic and prokaryotic cells?
6. What is cellular respiration? Write and label the BALANCED chemical equation (reactants, products, etc.)
7. Where do animals get the energy they need for cellular respiration?
8. Locate the following organelles, and know their function

Cell Membrane

Cell Wall

Cytoplasm

Nucleus

Mitochondria

Chloroplast

Endoplasmic Reticulum (ER)

Golgi Apparatus

Vacuole

Lysosome

1. What does energy balance mean?
2. What is metabolism?
3. What are proteins? What is their main function in the body?
4. What can happen if you do not get enough calories?
5. What can happen if you get too many calories?
6. What is ATP?
7. What are amino acids?
8. What happens to molecules of food in both plants and animals?
9. What is Basal Metabolic Rate? What does it tell you?
10. What is a food web?
11. How does the law of conservation of mass relate to food webs and energy transfer through ecosystems?

**Microbiology:**

1. What is microbiology?
2. What is a virus? List examples.
3. Are viruses living? Why or why not?
4. How can viruses be treated?
5. What happens to the host cell after the virus uses it?
6. What are bacteria?
7. Describe the structure of bacteria (pro/eukaryotic? Living/nonliving?)
8. How are bacterial infections treated?
9. What are fungi?
10. How do fungi help humans?
11. How do fungi harm humans?
12. What is a parasite?
13. Describe a parasitic relationship.
14. Compare and contrast viruses and bacteria. How are they alike AND different?
15. What type of cells are WE made up of?
16. What is antibiotic resistance? How does this affect humans?
17. What is a pandemic?
18. What is an epidemic?
19. Define the following: pathogen, vector, antimicrobial, microbe

**Hydrosphere:**

1. What is polarity? Why is a water molecule polar? Which element gains electrons (is negative) and loses electrons (is positive)?
2. What is cohesion? Give an example.
3. What is adhesion? Give an example.
4. What is surface tension? Give an example.
5. Why is water called the universal solvent?
6. What percentage of the Earth is water? Is freshwater? Is salt water? Of the freshwater is frozen?
7. What are the 4 parts of the water cycle?
8. What is transpiration?
9. What is run off?
10. What is groundwater?
11. What is surface water?
12. Where does the energy for the water cycle come from?
13. Where does all water eventually flow?
14. What is a divide?
15. What is an aquifer? What is necessary for an aquifer to form?
16. What does permeable mean? Impermeable? Give examples.
17. What is porosity?
18. What is lake turnover?
19. What is eutrophication? What is the difference between natural and cultural eutrophication?

**Hydrosphere Continued:**

1. Why is water unique?
2. How do oceans affect weather and climate?
3. Why does cold water sink to the bottom of the ocean and warm water rise to the top?
4. What is an estuary? Why is it considered a nursery?
5. What is the largest estuary in NC?
6. Why are oysters and bacteria important to an estuary?
7. What is upwelling? Why is it important?
8. What are the MOST important photosynthesizers in the ocean?
9. How does dissolved oxygen enter the ocean water?
10. What natural resources are found in the ocean?
11. Why is shipping important?
12. What are hydrothermal vents? Where are they located? Why are they important?
13. What are chemophiles? What is chemosynthesis? Where are these organisms found?
14. What is overfishing? Why is it a problem?
15. How do scientists use sonar to learn about the ocean?

**Populations and Ecosystems:**

1. What is an ecosystem? Give an example.
2. What is a community? Give an example.
3. What is a population? Give an example.
4. How do scientists know an ecosystem is healthy?
5. What is a niche? Give an example.
6. What is population density?
7. What are limiting factors?
8. How are density dependent limiting factors different from density independent limiting factors?
9. What is competition?
10. What is symbiosis?
11. What is mutualism? Give an example.
12. What is parasitism? Give an example.
13. What is commensalism? Give an example.
14. Where does all the energy on earth come from?
15. What is a producer? Give an example.
16. What is a consumer? Give an example.
17. What is a carnivore? Give an example.
18. What is a herbivore? Give an example.
19. What is an omnivore? Give an example.
20. What is biodiversity?
21. Draw an energy pyramid. What does it tell you?
22. What is a trophic level?
23. What percentage of energy is transferred from one trophic level to the next on an energy pyramid?

**Populations and Ecosystems Continued:**

1. What is a primary consumer?
2. What is a decomposer? Give an example.
3. Which trophic level stores the greatest amount of energy?
4. Which trophic level stores the least amount of energy?
5. What is a predator/Prey relationship?
6. What is a number pyramid? What does it tell scientists?
7. What is a biomass pyramid?
8. What is biomass?
9. List 3 biotic factors.
10. List 3 abiotic factors.
11. Be able to label the diagram of the Nitrogen Cycle.
12. Describe the carbon cycle.
13. Describe the oxygen cycle.

**Biotechnology:**

1. A microbial is a substance that kills \_\_\_\_\_\_\_\_ in order to prevent the spread of disease?
2. How does biotechnology affect agriculture?
3. How have we benefitted from biotechnology?
4. Technology is essential in science because…?
5. The driving goal of biotechnology is to?
6. List 5 examples of biotechnology products.
7. What is the source of the most recent emerging field within biotechnology?
8. List 5 Careers that biotechnology is involved with.
9. Name 3 industries that Biotechnology plays a significant role in?
10. Name 5 areas of our lives that Biotechnology affects?

The Change Over Time and Natural Resources Units were omitted from this study guide, as these were just completed and should be fresh in your mind. Use your Unit Test Study Guides to review the material from these units in addition to the EOG Review Study Guide.