Happy Thursday!!!

Agenda:
1. Homework Check Emission Spectrum
   SG pages 7-8
2. Notes: pH(Acids and Bases)
3. Answers for Forever Warm pages 4-5
   & Electromagnetic Radiation Questions page 6
4. Extra Practice: D.7 Acids, Bases, pH Scale

HW: Finish D.7 (SG: pages 11-12)
1. What is the main idea of the passage?
   a. Global warming may very well happen.
      b. Global warming may have severe repercussions for the entire earth.
      c. Sea levels could rise by three or more feet by the middle of the 21st century.

2. This passage is concerned with the
   a. scientists who study earth’s environment.
   b. polar ice caps and why they melt.
   c. regular flooding of coastal areas.
      d. consequences of the increase in average atmosphere temperatures around the earth.

3. Some scientists predict that in 50 years,
   a. there will be no winter weather on earth.
   b. the earth will be uninhabitable.
      c. seas could rise three or more feet.
   d. New York City and London will disappear.

4. The effects of global warming as described in this passage
   a. seem likely to happen.
   b. are certain to happen.
      c. are based on faulty ideas.
      d. cannot be prevented at this late date.

5. The writer presents “greenhouse effect” by
   a. explaining the chemical names of the gases.
      b. giving an explanation of the process.
      c. listing the results of careful measurements.
      d. defining the major climatic zones.

6. In this passage, the word displace means to
   a. incur the disapproval of.
      b. force to flee from home.
      c. put in a particular position.
      d. restore to a former position.
Electromagnetic Radiation Questions

1. Why is the word spectrum a good descriptor of the types of energy found in electromagnetic radiation?

Color Range

2. What is the relationship between frequency and wavelength of a wave?

long wavelength = low frequency (Inverse)

3. Use the wave on the left to:
   a. Label the wavelength for each
   b. Label the amplitude for each
   c. Circle one cycle
   d. Which wave has a longer wavelength?
   e. Which wave has a larger frequency?
   f. Which wave has a larger energy?

\[
\frac{a}{b} \quad \text{and} \quad \frac{b}{a}
\]
direct
4. Use the figure to the right to identify the type of wave that has:
   a. The highest frequency
   b. The longest wavelength
   c. The color of visible light with the greatest energy

5. Which type of electromagnetic radiation travels through the atmosphere?
   - Infrared
   - UV
   - Visible

6. Which type of electromagnetic radiation is harmful to humans? Explain how.
   - UV-A (absorbed ozone)
   - UV-B (sunburn)

7. Besides visible light, what are possible uses for electromagnetic radiation? (Tell me the type of radiation and the use.)
   - UV → production of Vitamin C
Claims and Evidence (2 points)

What element is in the unknown gas tube? How do you know?

Helium (same spectrum)

Analysis Questions: (1 point each)

1. Which color of light has the most energy?

Violet

2. Describe the differences between the spectra of the light bulbs and the spectra of the gas tubes. Be specific!
   (Do you see the same colors? Is there the same amount of each color?)

light bulbs - all of the colors
gas tubes - partial spectrums

3. What is the purpose of the prism glasses?

Splits light into its individual colors

4. Why can one say that an atom’s atomic spectrum is like a fingerprint?

unique
QN: Acids vs Bases

- Acidic things have a pH < 7 and have more hydrogen ions [H⁺] than hydroxide [OH⁻] ions.
- Neutral things have a pH = 7 and have equal amounts of hydrogen ions [H⁺] and hydroxide [OH⁻] ions.
- Basic things have a pH > 7 and have more hydroxide [OH⁻] ions than hydrogen ions [H⁺].
<table>
<thead>
<tr>
<th>OH⁻ concentration moles per liter</th>
<th>Mid-points of pH ranges for process control</th>
<th>pH values of some common substances</th>
<th>H⁺ concentration moles per liter</th>
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<td>EXTREMELY ALKALINE</td>
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<td>Vinegar</td>
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**High OH⁻ Concentration**

**High H₃O⁺ Concentration**

\[ \text{H}^+ = 1 \times 10^{-14} \]
Note: $H^+$ is the same as $H_3O^+$
UNIT 2
D.7 EXTRA PRACTICE: ACIDS, BASES, AND THE pH SCALE

Answer the following questions using your knowledge of acids, bases, and the pH scale.

1. What is the pH scale?
   
   

2. Indicate the pH range for the following:
   a. Acid ______________________
   b. Base ______________________
   c. Neutral ____________________

3. What atom is present in many acids? ______________________
4. What ion is present in many bases? ______________________
5. What is the formula for the following?
   a. Nitric acid ______________________
   b. Sulfuric acid ____________________
   c. Phosphoric acid __________________
   d. Potassium hydroxide ________________
   e. Water ____________________________
6. List 3 compounds that are neutral:

7. What is an alkaline solution?

8. Using Figure 2.67 in your textbook, provide the pH for the following:
   a. Lemons
   b. Drain cleaner
   c. Eggs
   d. Oranges
   e. Household ammonia

9. Determine whether the following pH values indicate a neutral, acidic, or basic substance:
   a. pH = 5.5
   b. pH = 7.0
   c. pH = 6.5
   d. pH = 7.5
   e. pH = 12

10. Tomatoes have a pH = 4 and water has a pH = 7. How many more times acidic are tomatoes than water?

11. Household ammonia has a pH = 12 and water has a pH = 7. How many more times basic is household ammonia than water?