Periodic Table Scavenger Hunt – Answer Key

Directions
Using your computer, tablet or mobile device, navigate to the website: www.ptable.com
You will interact with this periodic table to find the answers to the questions below.

1. What color element symbol designates elements that are a gas at a given temperature? Red

2. What family of elements does the light pink color indicate? Transition metals

3. Hover the cursor over Magnesium, Mg, what type of specific information is given about the element? Atomic number, symbol, name, atomic mass, and electron count for each shell.

4. Now click on the element symbol for Magnesium, Mg. What information are you presented with? The Wikipedia page for the element will open in a new table, students can read more in depth about the specific element.

5. What are the element symbols for the Metalloid elements? B, Si, Ge, As, Sb, Te, At

6. What is the symbol and atomic number of the element with the most protons according to this periodic table? Click on its symbol to find out what year it was discovered. Uuo, Atomic # 118. It was discovered in 2002.

7. If an element’s symbol is written in blue, what information does this tell you? That element is currently in the liquid phase based on the temperature value currently selected by the slider in the top right of the table.

8. Reduce the temperature value to 0K, using the control (shown in the upper right hand side of the screen). How many gaseous elements exist at 0K according to the table? How many liquid elements exist? List the symbol of any elements that fall in these categories. There are no gases when the temperature is 0K. There is only one element that exists as a liquid at 0K, it is Helium, He.

9. Change the temperature value to room temperature, 298K. At the top of the screen, choose the “Properties” tab. How does this view differentiate between solid, liquid and gas element states? There are only 3 colors for the elements in this view, the solids are filled in with black, liquids are blue and gases are red.
10. Using your cursor, choose Iron, Fe. Determine the following values for Iron:
   
   a. Melting Point = 1811K  
   b. Boiling Point = 3134 K  
   c. Atomic Radius = 156 pm  
   d. Density = 7874 kg/m³

11. A large value for thermal conductivity means that the element is a strong conductor of heat, whereas a small value means the element is a weak conductor. Find the elements that are the strongest and weakest conductors of heat; List their symbol and conductivity value below (Select “Thermal Conductivity” to sort the table by this property).
   **Strongest thermal conductors:** Silver (Ag)= 430W/mK, Copper (Cu) = 400W/mK, Gold (Au) = 320W/mK
   **Weakest thermal conductors:** Chlorine (Cl)= 0.0089W/mK, Krypton (Kr) = 0.00943W/mK, Xenon (Xe) = 0.00565W/mK, Radon (Rn) = 0.00361W/mK

12. By specifically selecting any of the properties at the top of the periodic table, you can sort the table by individual details. Highlight the “discovered” option from the list. Can you find an element that was discovered in each of the following years? (Use the slider to help move through time!)
   
   a. 1772 = Nitrogen (N)  
   b. 1803 = Rhodium (Rh), Iridium (Ir), Osmium (Os), Cerium (Ce), Palladium (Pd)  
   c. 1900 = Radon (Rn)  
   d. 2004 = Ununtrium (Uut), Ununpentium (Uup)

13. At the top of the screen, choose the “Orbitals” tab. The periodic table is now identified by only four specific sections, what do each of the colors represent?

   The table is categorized by orbital blocks. Pink = s, orange = p, green = d and purple = f.

14. As you move the cursor over the elements, you should see the correct orbital diagram at the top center of the screen for each element, as well as the electron configuration for each element displayed at the top right. What is the electron configuration for Selenium, Se, atomic #34?  
   1s² 2s² 2p⁶ 3s² 3p⁶ 4s² 3d¹⁰ 4p⁴

15. At the top of the screen, choose the “Isotopes” tab. Click on Copper, Cu, atomic #29. How many isotopes are shown for Copper and what are the abundancies of each?  
   There are two isotopes of Copper, Cu-63 (69.17%) and Cu-65 (30.83%)

16. Click on Tellurium, Te, atomic #52. How many isotopes are shown for Tellurium?  
   There are 11 isotopes of Tellurium.
*Click the “Wikipedia” tab in the top left of the screen, it should produce a drop down menu for you to choose from. Select “Videos.”

17. Choose element #10, neon and watch the short video.
   a. What color is a “neon light”?
      Bright Orange/Red
   
   b. Where would you see neon used this way in your everyday life?
      Store lights, like “open” signs in store windows.

18. Choose element #37, Rubidium and watch the short video.
   a. What reaction is conducted with Rubidum?
      Rubidum reacting with water
   
   b. What are the results of the reaction?
      Small explosion, smoke – expected it to be bigger.

19. Choose element #16, Sulfur and watch the short video.
   a. What is the “Barking Dog Experiment?”
      CS₂ (Carbon disulfide) + N₂O (laughing gas) will burn and create sulfur as well as heat and light
   
   b. What was a historical use for this reaction years ago?
      This reaction was used as a “flash” in photography.

20. Choose your favorite element, or the element symbol that appears in your written name the most often and watch the short video for it.
   a. What element did you choose?
      Answers will vary
   
   b. What did you learn about this element?
      Answers will vary