

1.19 Activity

Exploring the Modern Periodic Table

Report

How I Am Being Assessed _____

In this activity, you will work with a partner to find patterns or trends in the elements in the periodic table.

1. Look at the periodic table at the back of your text. The key at the top indicates the state at room temperature (solid, liquid, or gas) by the colour of the element's symbol. If the element's symbol is black, it is a solid. If the symbol is blue, the element is a liquid. If the symbol is red, it is a gas.

(a) Which elements are gases at room temperature?

H, He, N, O, F, Ne, Cl, Ar, Kr, Xe, Rn.

(b) Name two elements that are liquids at room temperature.

Hg, Br

2. Metals have a green background. Nonmetals have an orange background.

(c) On which side of the table do you find the elements that are metals?

Left

(d) On which side of the table do you find the elements that are nonmetals?

Right

(e) Are most of the elements metals or nonmetals?

(f) What are the elements called that have a purple background?

metalloids.

(g) Why are they called that?

properties of both

3. Find the names of the elements with the following chemical symbols:

H hydrogen

Al Aluminium

Fe iron

Eu Europium

Kr Krypton

Xe Xenon

4. Find the chemical symbols for the following elements:

helium He

iodine I

lead Pb

plutonium Pu

uranium U

einsteinium Es

5. Find the atomic numbers for the following elements:

Lr 103

Cs 55

Pt 78

Ag 47

He 2

Si 14

6. Find the atomic mass for the following elements:

sodium 23.0

zinc 65.4

chlorine 35.5

lithium 6.9

bromine 79.9

argon 39.9

7. Mendeleev used atomic masses to organize his periodic table. What two elements are "out of order" in the fifth row, according to atomic mass?

Te, I

8. Look at the densities and melting points of the elements.

(i) Which element has the highest melting temperature? What is it?

~~W~~ C → 3550

(j) Which element has the lowest melting temperature? What is it?

He -272

(k) Which element has the greatest density? What is it?

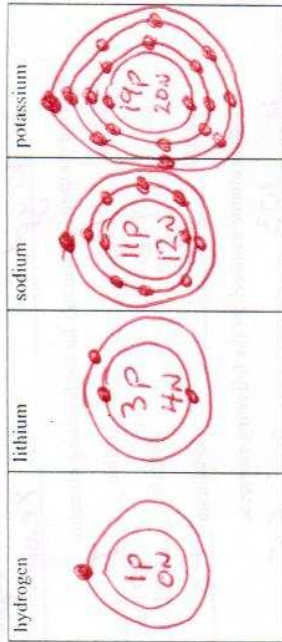
Os 22.5 g/mL

(l) Which element has the lowest density? What is it?

H .0899 g/mL

9. Elements 1, 3, 11, and 19 are in the first column of the periodic table.

(l) Draw Bohr-Rutherford diagrams for these elements. (Remember: the order of filling in the first three orbits is 2, 8, 8.)

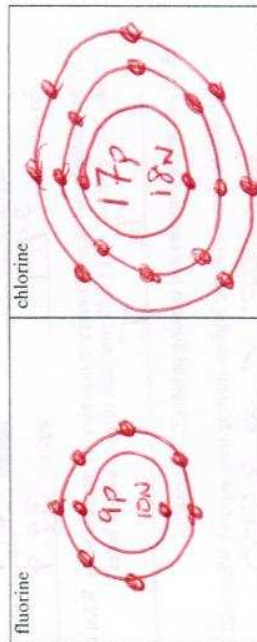


(m) How many electrons are in the outer orbit of each of these elements? 1

(n) How many electrons do you think there are in the outer orbit of the elements Rb and Cs? 1

10. Elements 9 and 17 are in the second-last column of the periodic table.

(o) Draw Bohr-Rutherford diagrams for these elements.



(p) How many electrons are in the outer orbit of each of these elements? 7

(q) How many electrons do you think are in the outer orbit of the elements Br and I? 7

11. Look at elements 3 to 10.

(r) Draw Bohr-Rutherford diagrams for these elements.

lithium	beryllium	boron	carbon
nitrogen	oxygen	fluorine	neon

(s) Describe the general pattern (trend) that you observe across a row of the periodic table. (Hint: Look at the outer orbit of the electrons.)

of electrons increases by 1 each time.

12. Elements in the periodic table have been arranged in columns or groups according to their properties. Name four elements that have properties similar to lithium.

Na, K, Rb, Cs

13. Helium is a gas that will not burn. Name three other gaseous elements that probably will not burn either.

Ne, Ar, Kr.