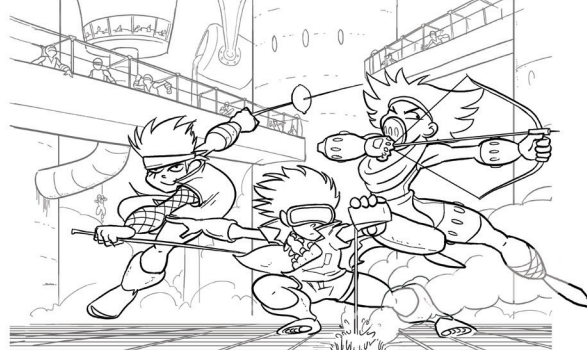


# SCIENCE NINJAS VALENCE<sup>®</sup> Chemistry Quiz!



1. How many atoms are in a water molecule?

- A. 1
- B. 2
- C. 3
- D. 4

There are three atoms in water - two Hydrogen and one Oxygen atom!

2. How many fluorine atoms would be required to create a neutral compound with carbon to form a halocarbon?

- A. 1
- B. 2
- C. 3
- D. 4

A carbon atom has four valence electrons, and it takes four fluorine atoms to take each one from carbon to form a stable halocarbon.

3. What is always part of an Acid?

- A. Carbon
- B. a Halogen (like Chlorine or Fluorine)
- C. Hydrogen
- D. Oxygen

Hydrogen is always part of an Acid, however you define an Acid!

4. In the game Valence, what is always part of a Base?

- A. a Sodium-Oxygen pair
- B. an Oxygen-Hydrogen pair
- C. Carbon
- D. a Carbon-Hydrogen pair

There are different ways to define a base, but having a hydroxide (an OH group) is a good indicator you're dealing with a base. The Base card in Valence has a metal and OH group.

5. In Valence, the products of an Acid-Base reaction are \_\_\_\_\_ and \_\_\_\_\_.

- A. Carbon Dioxide and Oxygen
- B. Salt and Water
- C. Water and Metal Oxide
- D. Carbon Dioxide and Salt

By the Arrhenius definition of a Base, the products of an Acid-Base reaction are salt and water. This is true in Valence as well!

6. In Calcium Chloride, there is a ratio of \_\_\_\_\_ Calcium to \_\_\_\_\_ Chlorine

- A. 1, 2
- B. 1, 1
- C. 2, 1
- D. 1, 4

Calcium Chloride is one Calcium atom paired with two Chlorine atoms.

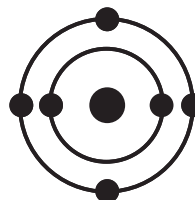
8. Which of the following elements are metals?

- A. Carbon and Hydrogen
- B. Fluorine and Chlorine
- C. Sodium, Potassium, and Calcium
- D. Oxygen and Carbon

Sodium, Potassium, and Calcium are metals.

9. Carbon's valence number is 4. Looking at this diagram of Carbon, what does the "4" refer to?

- A. the number of protons
- B. the number of neutrons
- C. the number of electrons
- D. the number of valence electrons



Carbon has four electrons in its outermost shell - it's Valence shell.

10. Which of these Elements are most similar?

- A. Sodium and Potassium
- B. Carbon and Oxygen
- C. Oxygen and Chlorine
- D. Hydrogen and Potassium

Sodium is right above Potassium on the Periodic Table, so they have similar properties.

11. Which of these compounds is the most stable?

- A. Sodium Oxide
- B. Carbon Dioxide
- C. Hydrofluoric Acid
- D. Sodium Hydroxide

12. Which Element has the lowest Atomic number?

- A. Hydrogen
- B. Oxygen
- C. Sodium
- D. Carbon

13. Which of the following is a Salt?

- A. Carbon Dioxide
- B. Carbon Tetrafluoride
- C. Calcium Oxide
- D. Sodium Fluoride

Carbon Dioxide is the only compound here that doesn't break down in an Acid Base reaction. In fact, Carbon Dioxide's stability is a problem for climate change, since it is difficult to get out of the atmosphere.

The Atomic Number measures how many protons are in an element - Hydrogen only has one! Can't get lower than that (and still be an element!)

When a metal like Sodium forms a compound with a Halogen like Fluorine, it forms a salt! Sodium Fluoride is often added to water to improve dental hygiene.