

Study Guide for Week 1 Quiz - Grade 7

Remember - these are guidelines - see teacherNotes and your own notes for more details.

Vocabulary

atom - the smallest piece of an element. Made of protons, neutrons and electrons.

nucleus - the central part of the atom that contains protons and neutrons.

proton - a positively charged particle in the nucleus of an atom.

neutron - a neutral particle in the nucleus of an atom.

electron - a negatively charged particle orbiting around the nucleus of an atom.

element - one of 118 basic substances in the universe.

compound - a chemical with two or more elements in it.

molecule - a piece of matter made of one or more atoms.

valance - the number of electrons an atom will donate or accept in a reaction.

chemistry - the study of elements, their characteristics, behavior and reactions.

alchemy - an ancient philosophy that imagined the only elements were air, fire, water and earth.

ion - an atom with extra or missing electrons.

isotope - an atom with more or less than the expected number of neutrons.

anion - a negatively charged (too many electrons) ion.

cation - a positively charged *too few electrons) ion.

Concepts

All materials in our universe can be separated into 118 elements.

The smallest piece of an element is an atom. if you cut an element's atom into it's pieces, it is no longer that element.

Two or more atoms (could even be the same element) joined make a piece called a molecule.

Two or more different elements (e.g., iron and sulfur) that join are called a compound.

The number of electrons an atom has determine if and how it will combine with others. The number of electrons an element can donate or accept in a reaction is called its valance.

Some atoms end up with missing or extra electrons. These are called ions. Positive ones are cations (say “cat-ions”), negative ones are anions (say “an-ions”).

Alchemists believed the world was made of the visible elements: earth, air, fire and water. They imagined that you could turn any of these into any others - with a philosopher's stone or a universal solvent, or that you could create fire with imaginary stuff called phlogiston. None of it was actual.

Modern chemistry took scientists like Lavoisier, Boyle, Dalton and Rutherford to identify compounds, atoms, electrons and nuclear particles so that we could understand how these elements combined and reacted to m make everyday things. Mendeleev took all of these things and created a pattern of elements called the periodic table that could sort existing elements and predict new ones.

The periodic table sorts elements by the number of particles they contain. Each column means that you have increased the atomic number compared to the element before it. it reads from left to right, then top to bottom like reading a paragraph. Every element in a column has the same number of valance electrons.

Neutrons in the nucleus keep protons from simply repelling each other (since they are all positively charged). You expect there to be the same number of neutrons as protons, but there are two exceptions: (1) when atoms get larger, some arrangements of neutrons and protons are not stable, and (2) hydrogen has only one proton so it does not need neutrons - so normally it has zero neutrons.

Activities

Be able to diagram an atom by taking its information in the periodic table and filling that into / drawing it into a blank atomic diagram.