

took a bowling ball to the moon, it would weigh less on the moon than on earth. The mass of the bowling ball does not change. A bowling ball is a bowling ball. It contains the same amount of matter whether or not it is on the earth or the moon. But since there is more gravity on earth than on the moon, the bowling ball exerts more force (i.e. weighs more) on earth than on the moon.

12. What type of change in matter occurs when water changes into ice? **Physical.**
13. What type of matter change occurs when gasoline is burned in a car? **Chemical.**
14. What are the three subatomic particles that make up an atom? **Protons, neutrons, and electrons.** Which of these particles are in the nucleus? **Protons and neutrons.**
15. Why does an atom normally not have an electrical charge? **Because normally the number of protons equals the number of electrons in an atom, resulting in the atom having no overall electrical charge.**
16. What is the atomic mass of a hypothetical element with 27 neutrons and 38 protons? **65. Add together 27 and 38.**
17. How many electrons can the first shell hold? **Two.** How many electrons can the third energy shell hold? **Eighteen.**
18. You have identified what may be two new elements. One element contains 212 protons, 212 electrons, and 97 neutrons. The other element contains 212 protons, 212 electrons, and 208 neutrons. Have you indeed found two new elements? **No. Since both forms of this element contain the same number of protons and electrons, they are the same element. However, you have discovered two new isotopes of the same element, since they contain different numbers of neutrons.**
19. What happens when a chemical bond is formed? **Two atoms share their electrons, which causes the two atoms to stick together.**
20. What are reactants and products? **Reactants are the atoms or molecules which "go into" (or participate in) a chemical reaction, and products are what "comes out of" (or results from) a chemical reaction.**
21. What makes one acid stronger than another? **The more hydrogen ions present in an acid solution, the stronger the acid will be.**
22. True or False? Organic molecules are synthesized by all living organisms. **True.**
23. What four types of molecules do organic chemists study? **Proteins, fats (lipids), carbohydrates, and nucleic acids.**
24. What is an isomer? **One or more molecules that share the same molecular formula but which have different structures.**
25. What is the difference between anabolic and catabolic reactions? **Anabolic reactions synthesize organic molecules; catabolic reactions break organic molecules down into smaller units.**
26. What is a monomer? **A monomer is the basic building block of all organic molecules.**
27. Why is a hydrolysis reaction so named? **Because water is used to break the bond between the monomer and the polymer. Since water is added to the bond, the name hydrolysis or hydration reaction is used.**
28. What is a glycosidic bond? **A glycosidic bond is a bond that links together two saccharides. It forms between a carbon of one saccharide, an oxygen molecule, and a carbon atom of the other saccharide.**
29. What is an ester bond? **A bond that holds a fatty acid to the glycerol backbone. Specifically, an ester bond is an oxygen atom bonded to a carbon on the glycerol and a carbon on the fatty acid, linking the two together.**
30. What is the monomeric unit of a protein? **An amino acid.**
31. What is a peptide bond? **A bond holding two amino acids together.**
32. What are the three components of a nucleotide? **A central five-carbon sugar (called a pentose), a phosphate group, and a nitrogen-containing base (called a nitrogenous base).**