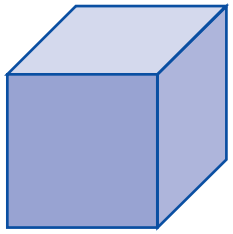
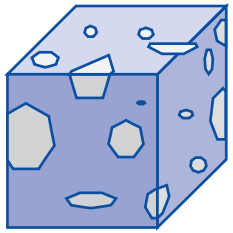
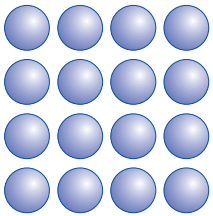
Types of Matter



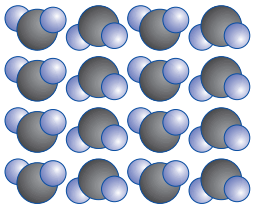
Homogeneous mixture



Heterogeneous mixture



Element

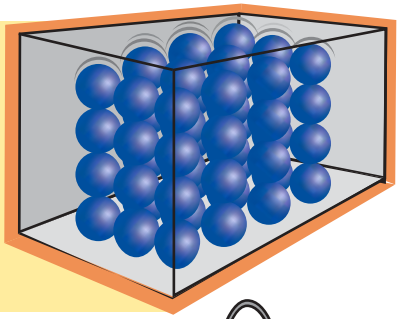


Compound

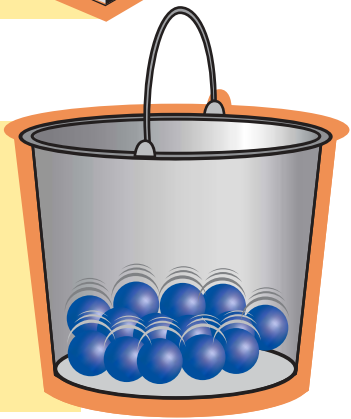
Type of matter	Definition	Examples
Homogeneous mixture	A mixture that contains more than one type of matter and is the same throughout.	soda pop, air, chocolate ice cream
Heterogeneous mixture	A mixture that contains more than one type of matter and is not the same throughout.	chicken soup, soil, fudge ripple ice cream
Element	A substance that contains only one type of atom.	copper metal, oxygen gas, liquid nitrogen
Compound	A substance that contains more than one type of atom.	table salt, rust (iron oxide), carbon dioxide gas

Changes of State

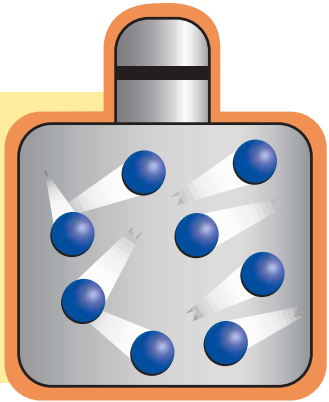
Frozen water molecules vibrate, but can't switch places.



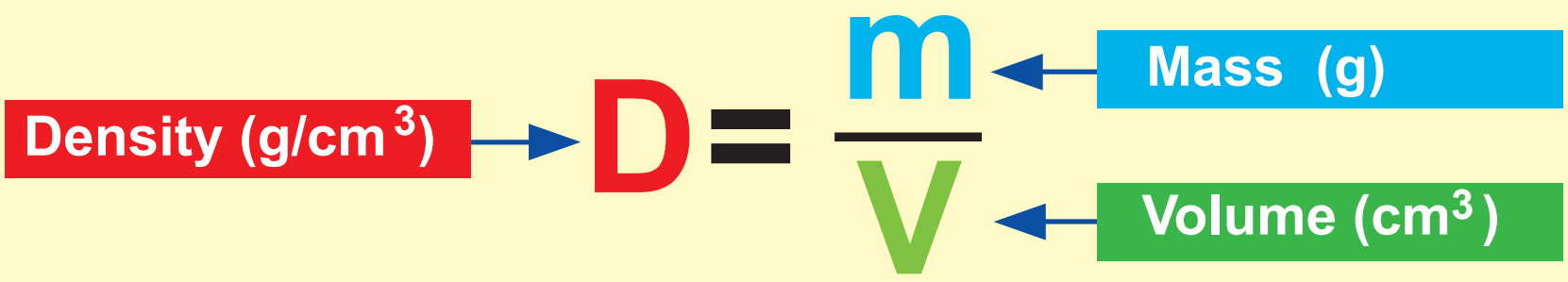
Water molecules in the liquid state slide over each other.



Water molecules in the gaseous state move randomly throughout their container.

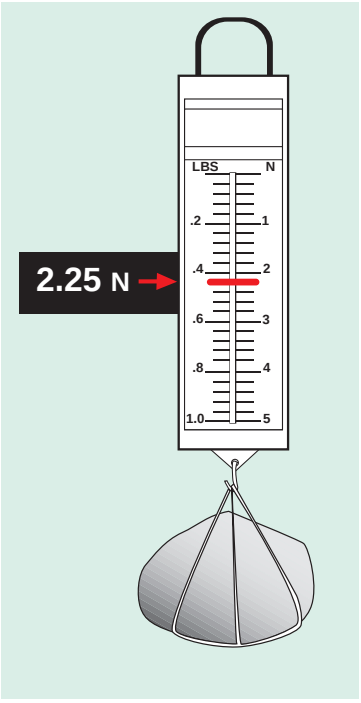


Density

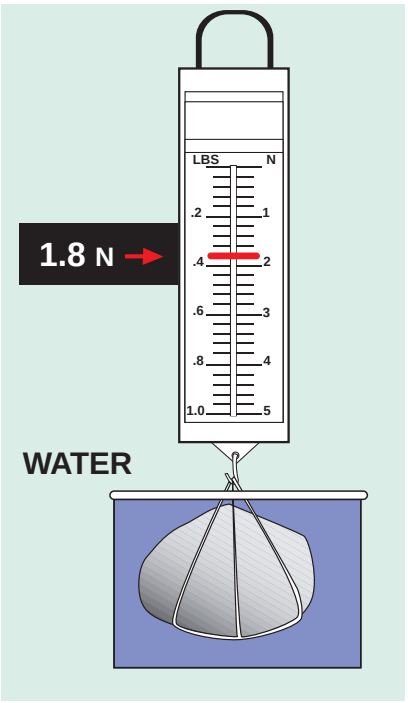


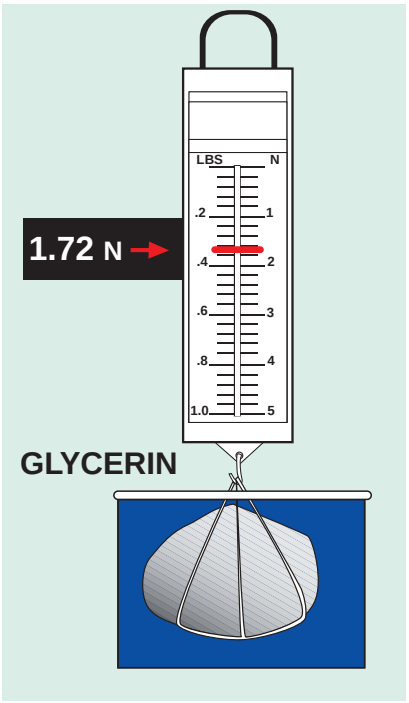
Object	Mass	Volume	Density
paper clip	0.36 grams	0.046 cm^3	7.8 g/cm^3
bicycle brake cable	19.8 grams	2.53 cm^3	7.8 g/cm^3

Buoyancy

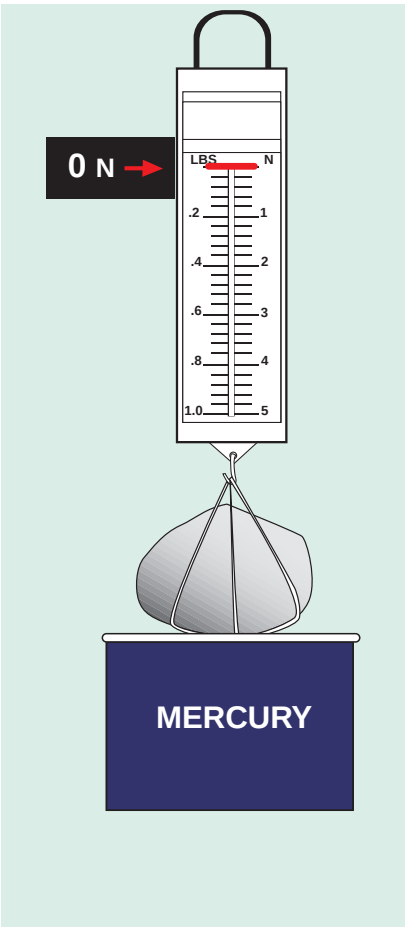


The rock weighs 2.25 N in air.





The rock weighs less in water and glycerin because these fluids exert an upward buoyant force on the rock.The rock weighs nothing in mercury. Why?

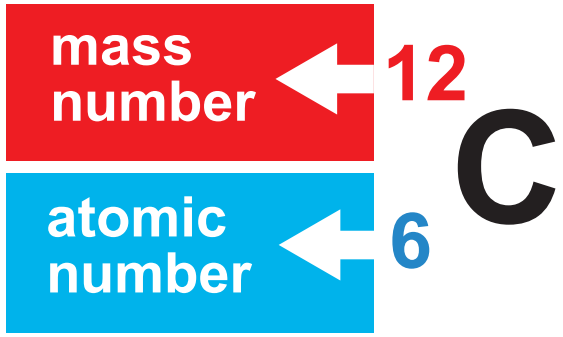


Which liquid exerts the most buoyant force on the rock?

Isotopes

Mass Number and Atomic Number

An atom of carbon-12 has 6 protons (the atomic number is 6), 6 neutrons, and 6 electrons.



Isotopes of carbon include carbon-12, carbon-13, and carbon-14.

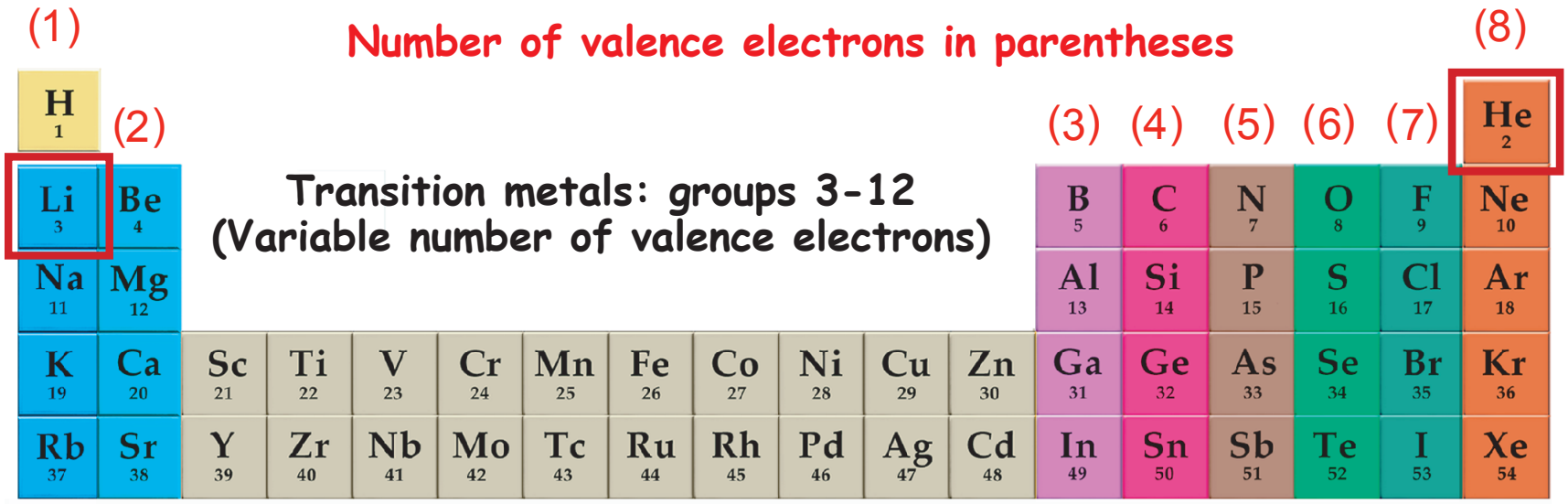
How many neutrons are present in an atom of carbon that has a mass number of 14?

Find the numbers of neutrons:
The mass number is the number of protons (p) plus the number of neutrons (n).

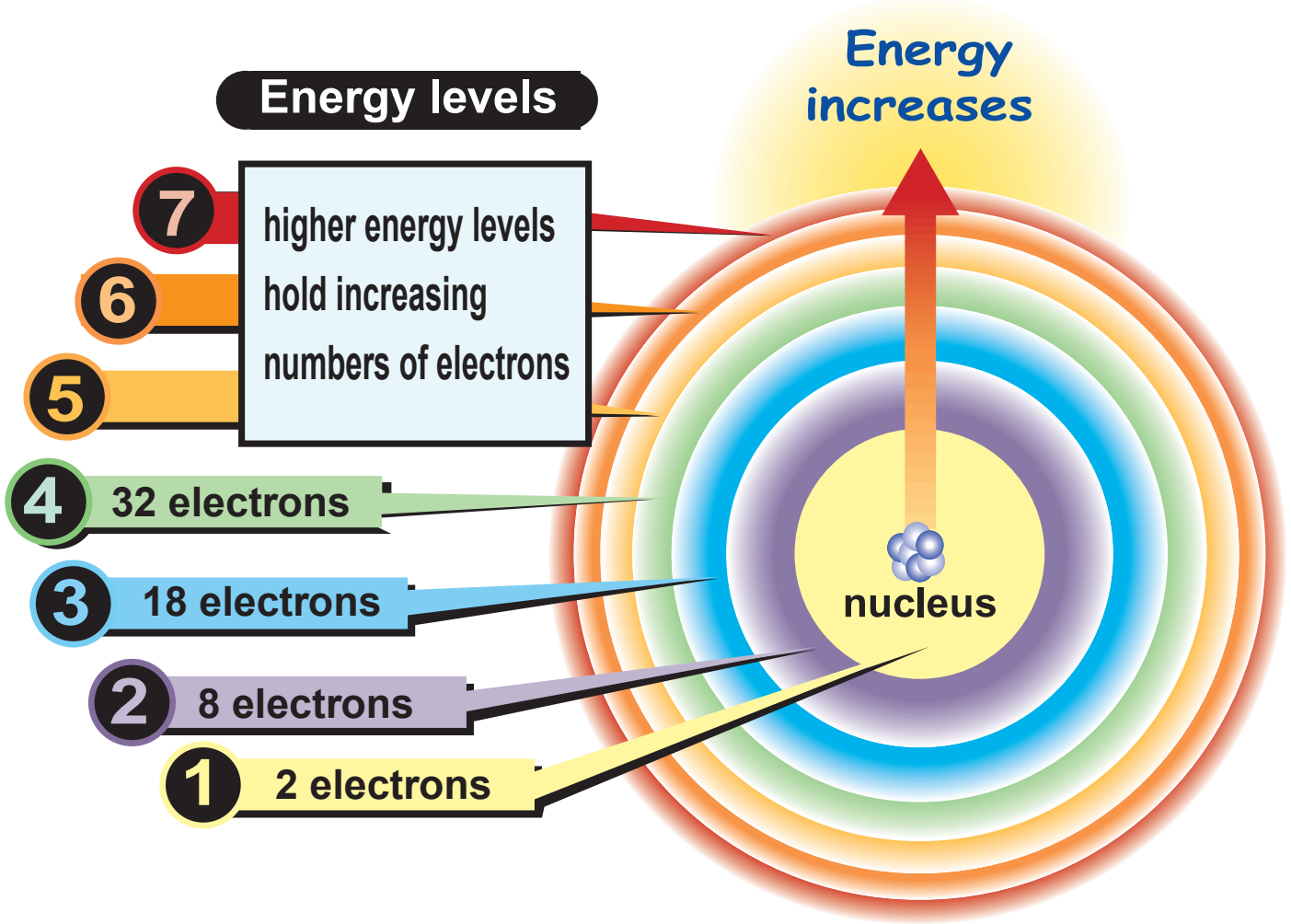
1. You are asked for the number of neutrons.
2. You are given that it is carbon-14. Carbon has 6 protons.
3. The relationship is $n + p =$ mass number
4. Solve for n.
   $n =$ mass number $- p$
5. Plug in numbers and get answer.
   $n = 14 - 6 = 8$

There are 8 neutrons in a carbon-14 nucleus.

Partial Periodic Table



Energy Levels in an Atom



Electrons occupy energy levels around the nucleus. The farther away an electron is, the more energy it possesses.