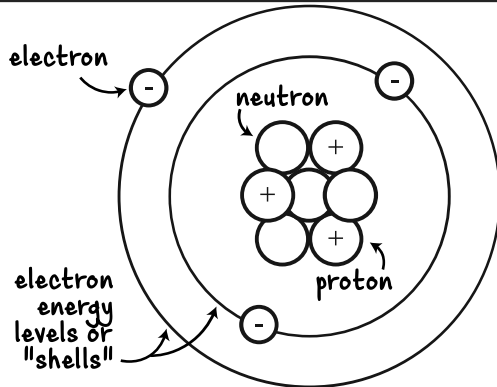


Chem You Need for Bio

Name: _____

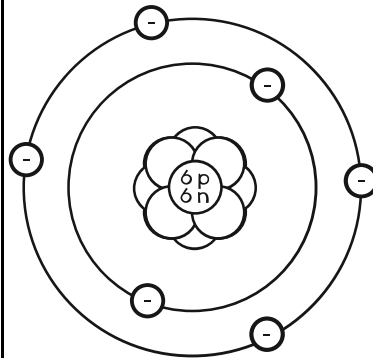


- _____ are made up of subatomic particles.
- _____ are negatively charged and are found in electron "shells" or "electron cloud" outside the nucleus.

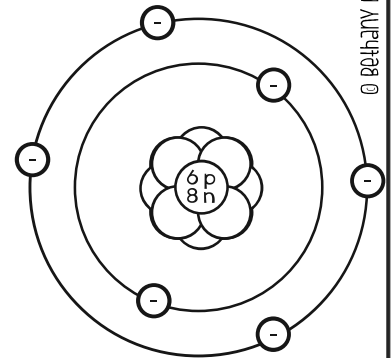
- Protons and neutrons are found in the _____.
- _____ are positively charged and the number of protons determines the element or "type" of atom.

Everything, including living things, are made of atoms.

- Biologists use isotopes in their research
 - Carbon Dating
 - _____
- Isotopes can be used to label molecules in an experiment

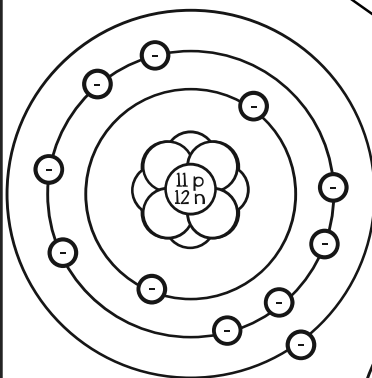


- Same number of protons
- DIFFERENT number of neutrons
- They are called _____.



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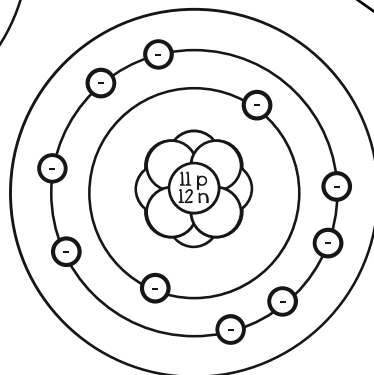
Isotopes are atoms of the same element that have a different number of neutrons.



Sodium atom (Na)

11 protons
12 neutrons
11 electrons

Electron is removed



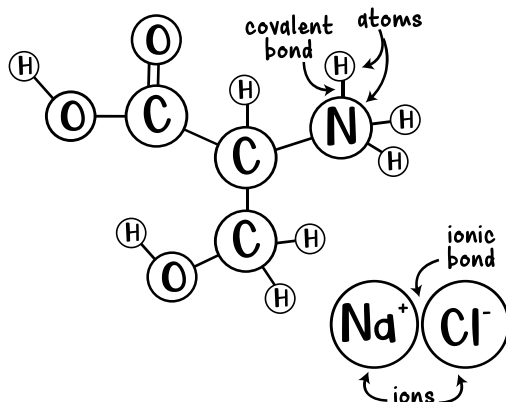
Sodium ION (Na⁺)

11 protons
12 neutrons
10 electrons

- When solid salts like NaCl dissolve in _____, they form ions.
- _____ ions have fewer electrons and _____ ions have more electrons than their normal atoms.
- Ions can be used to communicate between _____ (like nerve cells.)
- Many biochemical reactions occur only when there is a particular salt _____ in the cell or solution.
- Our body cells have a normal concentration of salt similar to _____.

_____ are atoms that have more or fewer electrons than protons; that's why they are _____

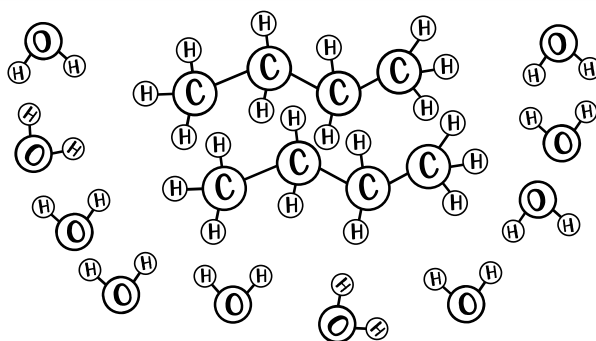
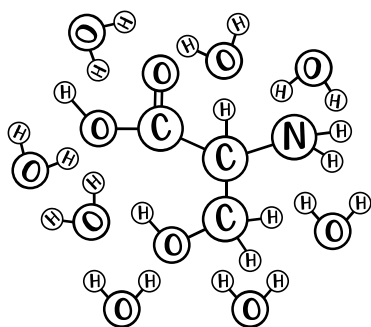
- Atoms in molecules are held together by _____ bonds.
- Atoms in a covalent bond together _____ electrons.



Name: _____

- Atoms in ionic solids are held together by _____ bonds
- Ionic bonds form when one or more electrons are _____ from one atom to another.
- The one that loses electrons becomes _____ charged. The one that gains becomes _____ charged.

Molecules and Ionic Solids are made of atoms



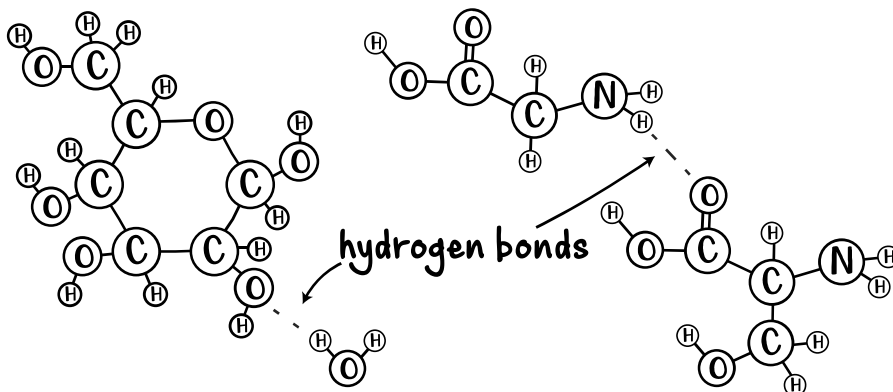
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- Some molecules are attracted or "stick" to _____ molecules.
- These are polar and are called _____ molecules.
- They often have nitrogen, oxygen, or sulfur atoms

- Some molecules are not attracted to water and stick to _____, away from water when possible.
- These are nonpolar and called _____ molecules.
- They are often mostly made of _____ and _____ atoms and have few oxygen or nitrogen atoms.
- The tendency for hydrophobic molecules to stick to each other and keep water out is called the _____

Some molecules act differently in water.

- Polar molecules are attracted to _____.
- Hydrogens bonded to oxygen or nitrogen atoms are VERY attracted to nearby oxygens or nitrogens. This strong attraction is called the _____.



Hydrogen bonds are really strong and really important.