**Pattern Matching: Organic Molecules Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ # \_\_\_**

What are living things made of? Common sense tells us that living things are somehow different from non-living things, but how deep does that difference run? Are living things made from different kinds of atoms than those in non-living things? Different kinds of molecules?

There may be as many as 10,000 different kinds of molecules in a living thing. But are there a few common patterns? A few common functions?

Objectives:

Once you have completed these exercises you should be able to:

* Know what an organic molecule is and how it differs from an inorganic molecule.
* Identify the major classes of organic molecules.
* Identify the distinguishing features of each class of molecules.
* Given a typical example of an organic molecule, identify the class to which it belongs.

**Pattern Matching**

Table 1 reviews the most common atoms found in living organisms and some of their properties. (These atoms also occur in non-living things.) As you work, notice if the atoms in your molecules follow the indicated bonding patterns.

**Table 1. CHNOPS: Common Elements in Living Things**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Abbreviation** | **Name** | **Atomic Number** | **Atomic Weight** | **Usual # of Bonds** |
| **C** | carbon | 6 | 12 | 4 |
| **H** | hydrogen | 1 | 1 | 1 |
| **N** | nitrogen | 7 | 14 | 3 |
| **O** | oxygen | 8 | 16 | 2 |
| **P** | phosphorus | 15 | 30 | 5 |
| **S** | sulfur | 16 | 32 | 2, [4, 6] |

**Identifying Categories of Biological Molecules**

Exercise 1

The objects you will be sorting are basic building blocks (subunits) of common macromolecules in living things. Do NOT refer to your books during this exercise. Use your own judgment in doing the sorting.

Cut out the set of unlabeled molecules below. Organize the 42 cards into groups based upon structural similarities. Pay special attention to:

• the elements (CHNOPS) in the molecule,

• the shape of the molecule,

• patterns within the molecule, and

• the ends of the molecule.

◊ How many groups of molecules do you have? \_\_\_\_\_

Explain your reasoning for creating these particular groups. (‘Quick-and-dirty’ sketches of general molecule shapes can be part of your explanations.)









