

Name: _____

The Same or Different? - Organic Isomers Activity

Isomers are organic compounds that have the **same molecular formula** (numbers and types of elements) but **different structural formulas** and therefore **different physical and chemical properties**. They will also have different names.

Note: You can start at **any station** but **PLEASE** make sure you are putting the correct information in for the correction station!

Black = Carbon

White = Hydrogen

Red = Oxygen

Green = Chlorine

Station 1

Go to **Station 1** and examine the molecules that have been constructed. **DO NOT TAKE THESE MOLECULES APART!**

Key Questions

1). After examining each set of molecules, complete the table below for each model.

	Model 1A	Model 1B
Number of Carbon Atoms		
Number of Hydrogen Atoms		
Number of Oxygen Atoms		
Number of Chlorine Atoms		
Molecular Formula		

2). Draw the structural formulas for Model 1A and Model 1B.

Model A

Model B

3). Are Model 1A and Model 1B isomers? How do you know?

Station 2

Go to **Station 2** and examine the molecules that have been constructed. **DO NOT TAKE THESE MOLECULES APART!**

Key Questions

1). Complete the table below for each model.

	Model 2A	Model 2B
Number of Carbon Atoms		
Number of Hydrogen Atoms		
Number of Oxygen Atoms		
Number of Chlorine Atoms		
Molecular Formula		

2). Draw the structural formulas for Model 2A and Model 2B.

Model 2A

Model 2B

3). Are Model 2A and Model 2B isomers? How do you know?

Station 3

Go to **Station 3** and examine the molecules that have been constructed. **DO NOT TAKE THESE MOLECULES APART!**

Key Questions

1). Complete the table below for each model.

	Model 3A	Model 3B
Number of Carbon Atoms		
Number of Hydrogen Atoms		
Number of Oxygen Atoms		
Number of Chlorine Atoms		
Molecular Formula		

2). Draw the structural formulas for Model 3A and Model 3B.

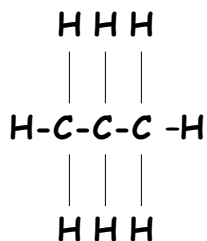
Model 3A

Model 3B

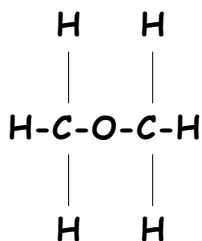
3). Are Model 3A and Model 3B isomers? How do you know?

Station 4 - Identifying Isomers

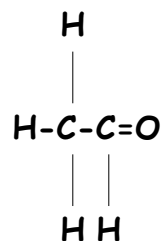
Circle all the isomers of C_2H_6O that are shown below. Determining the molecular formula ($C_xH_yO_z$) for each structure will make the process go faster!



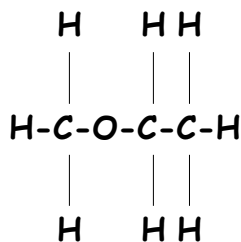
Mol Formula: _____



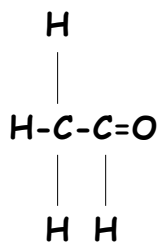
Mol Formula: _____



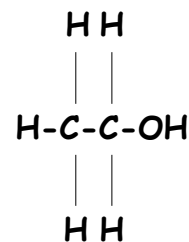
Mol Formula: _____



Mol Formula: _____



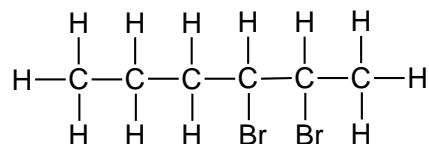
Mol Formula: _____



Mol Formula: _____

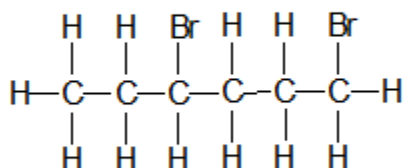
Station 5 - Identifying Isomers

Molecular Formula: _____

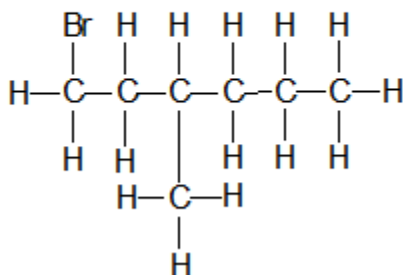


Determine the molecular formula for the structure to the right.

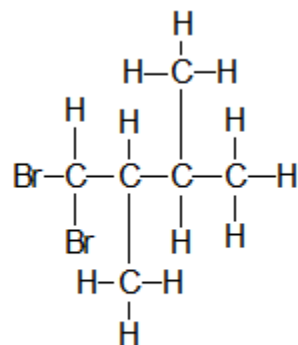
Circle all the isomers of this structure that are shown below. Determining the molecular formula for each structure will make the process go faster!



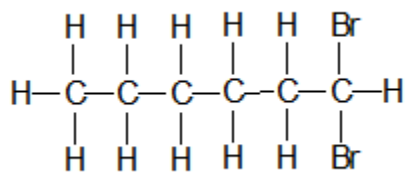
Mol Formula: _____



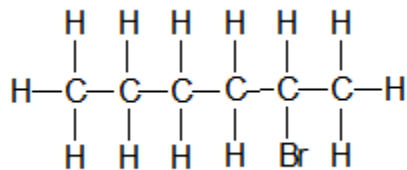
Mol Formula: _____



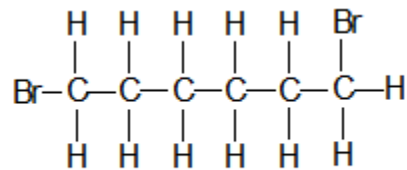
Mol Formula: _____



Mol Formula: _____



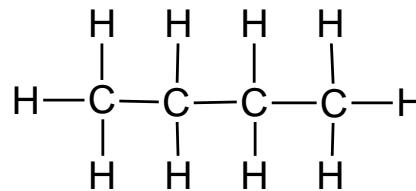
Mol Formula: _____



Mol Formula: _____

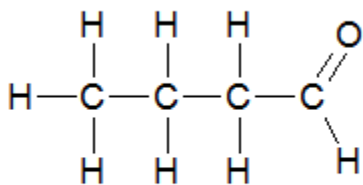
Station 6 - Identifying Isomers

Molecular Formula: _____

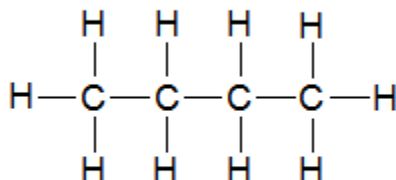


Determine the molecular formula for the structure to the right.

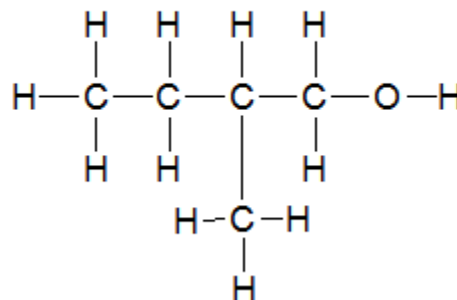
Circle all the isomers of this structure that are shown below. Determining the molecular formula for each structure will make the process go faster!



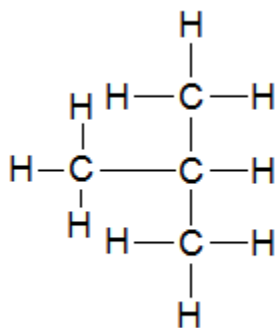
Mol Formula: _____



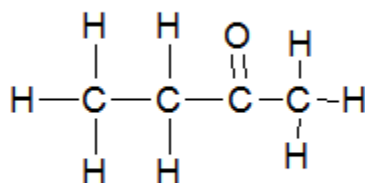
Mol Formula: _____



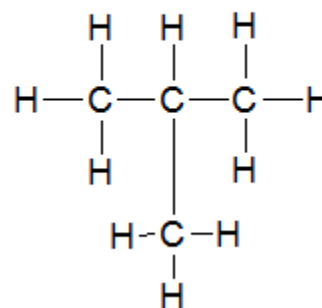
Mol Formula: _____



Mol Formula: _____



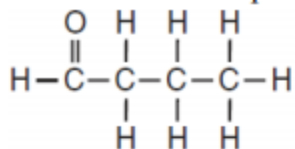
Mol Formula: _____



Mol Formula: _____

Station 7 - Regents Practice Questions

1. Given a formula representing a compound:



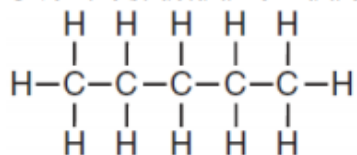
Which formula represents an isomer of this compound?

- A)
$$\begin{array}{cccc}
 \text{H} & \text{H} & \text{H} & \text{O} \\
 | & | & | & || \\
 \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\
 | & | & | & \\
 \text{H} & \text{H} & \text{H} &
 \end{array}$$
- B)
$$\begin{array}{cccc}
 \text{H} & \text{O} & \text{H} & \text{H} \\
 | & || & | & | \\
 \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\
 | & & | & | \\
 \text{H} & & \text{H} & \text{H}
 \end{array}$$
- C)
$$\begin{array}{cccc}
 \text{H} & \text{H} & \text{H} & \text{O} \\
 | & | & | & || \\
 \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{OH} \\
 | & | & | & \\
 \text{H} & \text{H} & \text{H} &
 \end{array}$$
- D)
$$\begin{array}{cccc}
 \text{H} & \text{H} & \text{O} & \text{H} \\
 | & | & || & | \\
 \text{H}-\text{C}-\text{C}-\text{C}-\text{O}-\text{C}-\text{H} \\
 | & | & & | \\
 \text{H} & \text{H} & & \text{H}
 \end{array}$$

3. Which two compounds are isomers of each other?

- A) $\text{CH}_3\text{CH}_2\text{COOH}$ and $\text{CH}_3\text{COOCH}_2\text{CH}_3$
 B) $\text{CH}_3\text{CH}_2\text{CHO}$ and CH_3COCH_3
 C) $\text{CH}_3\text{CHBrCH}_3$ and $\text{CH}_2\text{BrCHBrCH}_3$
 D) $\text{CH}_3\text{CHOHCH}_3$ and $\text{CH}_3\text{CHOHCH}_2\text{OH}$

4. Given the structural formula of pentane:



Draw a structural formula for an isomer of pentane.

2. The two isomers of butane have different

- A) formula masses B) empirical formulas
 C) molecular formulas D) structural formulas