Name: _____
Class: _____

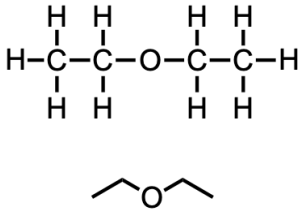
Stereoisomers Worksheet

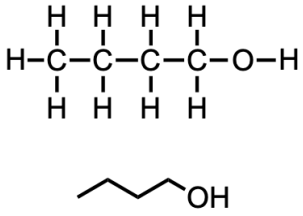
Warm-Up Questions:

Watch the Khan Academy videos on stereochemistry.

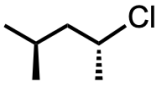
1) What is the difference between constitutional isomers and stereoisomers?

2) Label the following pair of molecules as either constitutional isomers or stereoisomers. Both the skeletal structure and bond line structure of each molecule have been provided.





3) How many chiral center(s) does the following molecule have?



Computational Exercise #1:

Take a screenshot of your optimized structure of (R)-1-bromo-1-chloroethane including atom and stereochemical labels. Choose the ball-and-stick representation styling tool.

Computational Exercise #2:

Take a screenshot of the tiled enantiomers for 1-bromo-1-chloroethane including atom and stereochemical labels. Choose the ball-and-stick representation styling tool.

Computational Exercise #3:

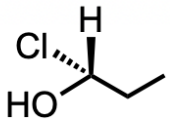
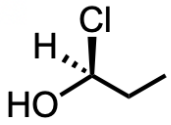
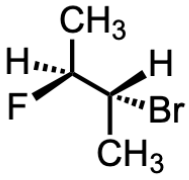
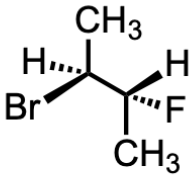
Take a screenshot of the tiled *cis* and *trans* diastereomers of 2-pentene including atom and stereochemical labels. Choose the ball-and-stick representation styling tool.

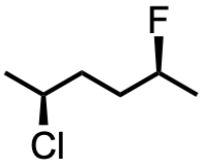
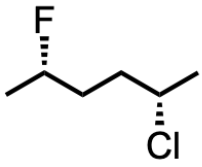
Individual Exercise:

For each pair of molecules:

1) Build the molecules using 2D sketcher in Maestro and Optimize their geometries by running Optimization Jaguar calculations. Attach screenshots of your optimized molecules tiled next to each other in the worksheet
2) Determine the stereochemical configuration using CIP rules
3) Determine whether the pair of molecules are identical, enantiomers, or diastereomers

See the stereoisomers lesson plan for an example answer.

 **Molecule A**  **Molecule B**	1) 2) 3)
 **Molecule A**  **Molecule B**	1) 2) 3)

 **Molecule A**  **Molecule B**	1) 2) 3)