

Grade / Age: 16-18

Topic: Stereochemistry of Molecules

Subject area: Organic Chemistry

Keywords: Isomers, enantiomers, alkenes, diastereomers

Single/ team work: single

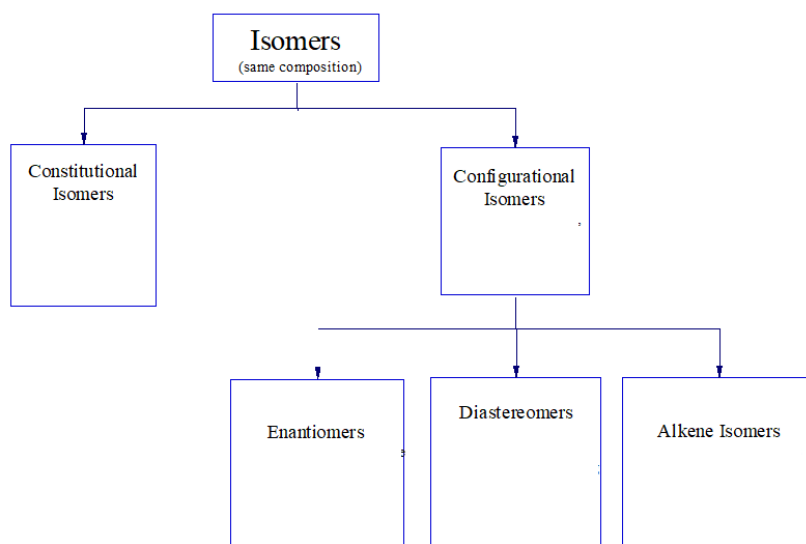
Language: english

Duration: 3x60 minute period

Description of the Task:

To use both a molecule kit and clip art/photos to illustrate and define the differences between constitutional isomers, alkene isomers, enantiomers, and diastereomers.

The General Idea: You will use Word, Canva, or good ol' paper to create a flow chart that designates the different ways that chemists denote three-dimensionality in molecules. It should follow the format below (not to scale):



The Specifics:

· In each square (other than the top "Isomers" square), there should include a **definition of that term** *in your own words*. Put it in such a way that someone not enrolled in Organic Chemistry could understand it.

○ *In other words, provide definitions for the "constitutional isomers", "configurational isomers", "enantiomers", "diastereomers", and "alkene isomers".*

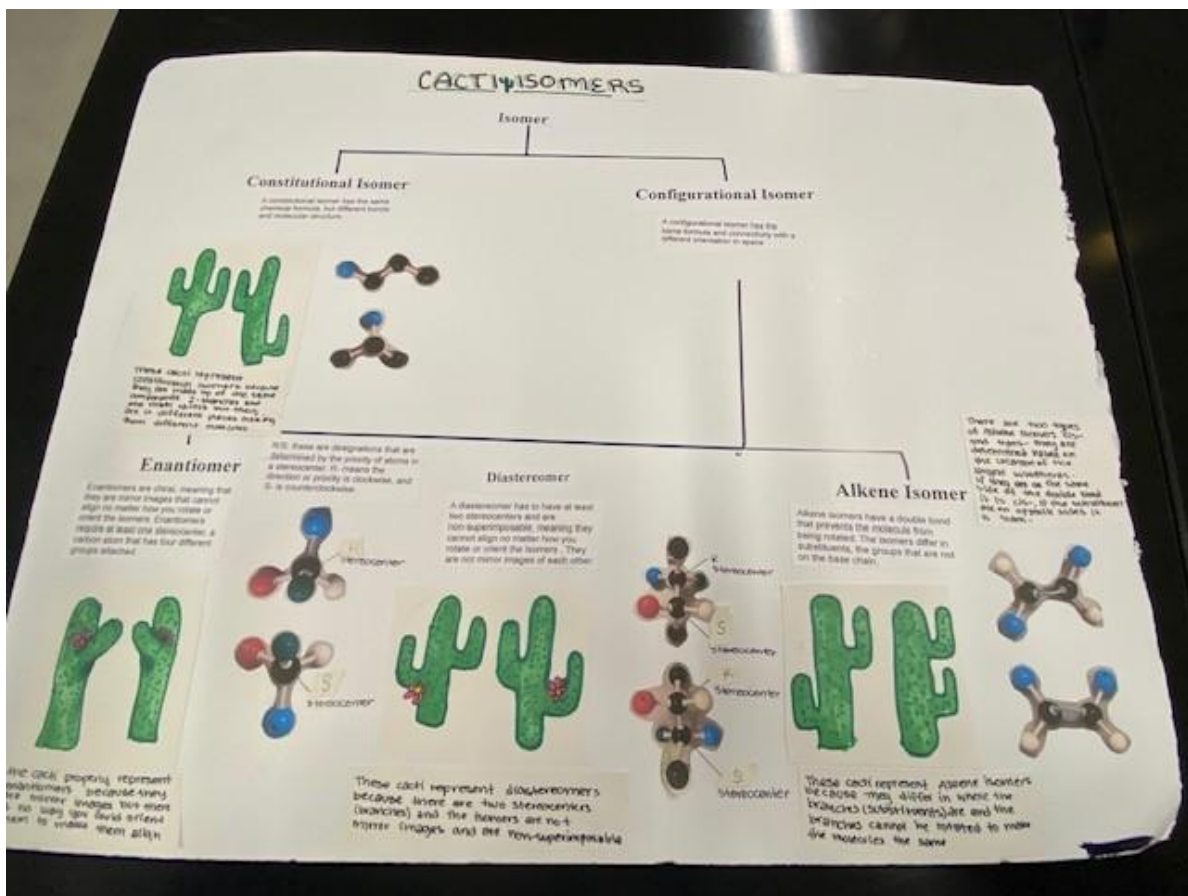
· The Constitutional Isomers, Enantiomers, Diastereomers, and Alkene Isomers squares should contain the following in addition to their definition:

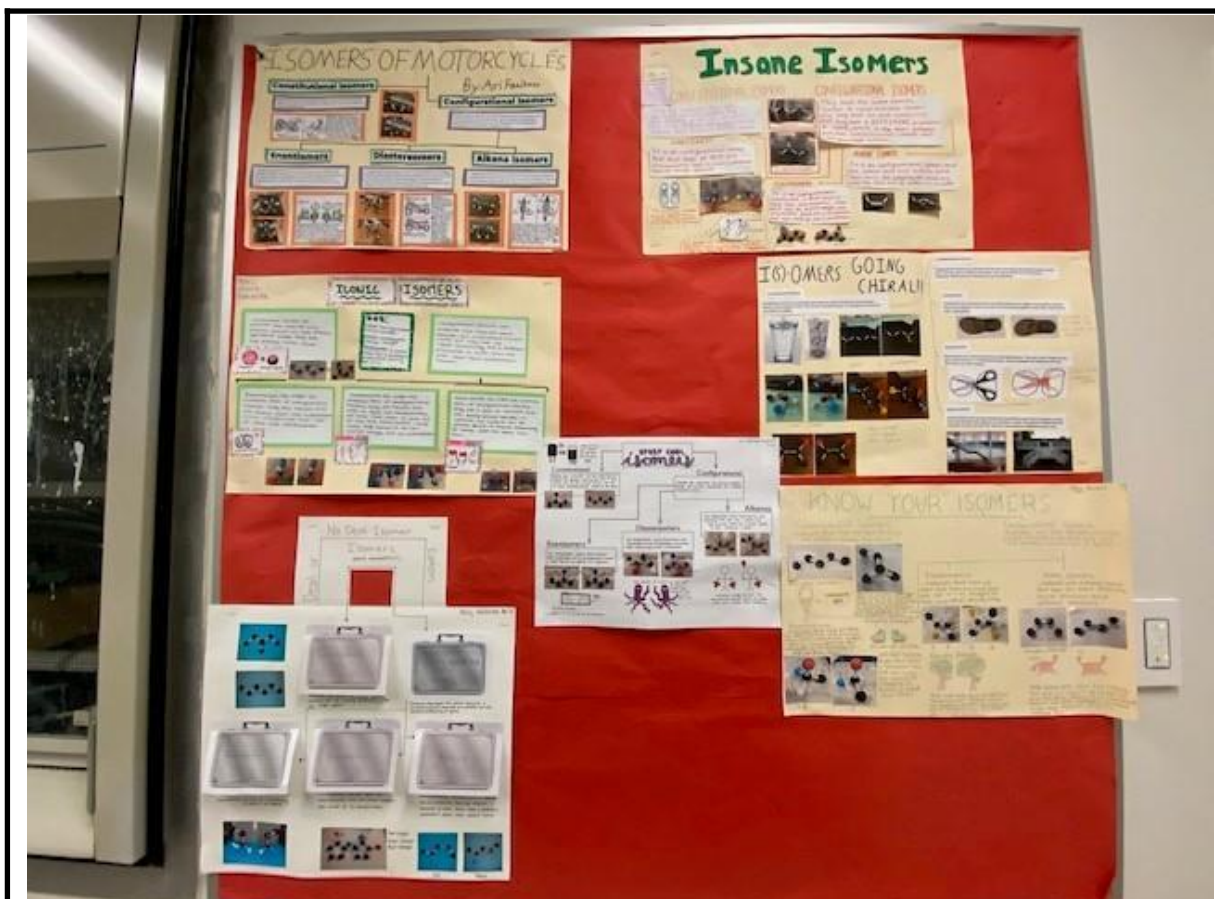
○ Two molecules, **prepared with a molecule kit**, that illustrate an example of the isomer relationship in question.

- An “everyday” example of this relationship. For example, your right and left ear are good examples of enantiomers. Include clip art, photographs, etc., as well as a written explanation showing this relationship in your everyday example. (Some of the relationships will require you to be more creative than others!)
- For the Enantiomer and Diastereomer Squares, designate “R” and “S” on all stereocenters of each molecule.

- Include a catchy title at the very top of your flow chart
- Make it colorful and eye-catching!

Solutions of the Task:





Prior knowledge:

- stereochemistry
- R- and s- designations of stereocenters
- alkanes, alkenes, alkynes (hydrocarbons)
- constitutional isomers

Comments:

- This project can act as a summative or formative assessment, and while it can be done in groups, it is usually easiest for students to do by themselves
- if students do not have access to molecular modelling kits, the teacher could provide toothpicks and clay
- access to a digital camera is needed to have students create and use their own molecule pairings.

Connection to other subjects/topics/areas:

- biology, art, dichotomous keys