

8A80.92 Miller-Urey Experiment Prop

To show a prop similar to the apparatus used in the Miller-Urey experiment.

DESCRIPTION: The Miller-Urey apparatus prop consists of a round bottom flask with two electrodes, a tube which connects this flask to a second round bottom flask below it, and a valve which would, in theory, be used to fill the chambers with gases. The different parts of the apparatus and their function in the actual experiment are discussed.

SUGGESTED TECHNIQUE

1. Show the Miller-Urey apparatus prop to the class. Discuss the various components and the creation of amino acids.

TECHNICAL DETAILS

LOCATION OF APPARATUS

EQUIPMENT	LOCATION
Miller-Urey Apparatus Prop	Astronomy A

LOCATION OF COMMON ACCESSORIES

SETUP INSTRUCTIONS

Setup Time ~15 min

1. Provide the Miller-Urey Apparatus Prop

ADDITIONAL RESOURCES

THEORY

The actual Miller-Urey Experiment would be performed as follows:

1. Connect a vacuum pump to the valve and remove all the air.
2. Add 1/3 atm CO₂ or CO, 1/3 atm methane, and 1/3 atm ammonia. The total pressure of the mixture of all three gases is 1 atm.
3. Add 1 cup water.
4. Close off the valve.
5. Heat the lower round bottom flask from below until the water boils. The boiling will fill the upper flask with steam.
6. Apply a spark to the two electrodes at the top flask.
7. Inject cooling water into the cooling jacket to condense the vapor products.
8. After 1 hour of operation the water will turn orange. The water will also have a small amount of tar build up. Let it run for two days.
9. Empty the water and perform chromatography on the products. Up to 8 amino acids have been found.