

Unit 3- Lesson 3

Chemistry 0

March 2021, L. Tracey Gao



Ageless Apples

- What do you observe happens over time?
- Why do you think this might be?
- Do you have any ideas about what might be causing this and how to slow or stop the process?



Ageless Apples

- When an apple is cut open, it releases a molecule called polyphenol oxidase (PPO). Once PPO is released, the apple reacts with oxygen in the air and turns brown.
- PPO is actually a catalyst. It makes other compounds in the apple react with oxygen in the air faster, so the apple turns brown faster. PPO itself does not react with anything.



Ageless Apples

- One way to change the rate of a reaction is to add or remove a catalyst. Another way is to change how a catalyst behaves.
- One thing that can affect a catalyst is pH. PPO works best when the pH is around 6.5. When the pH drops below 2.5, PPO stops working at all. If the PPO in an apple becomes inactive, the oxidation reaction that turns apple brown happens much slower (barely at all!)



Last week's homework

1. Please calculate the Kelvin temperatures for the freezing point of water and boiling point of water.
2. Are 100 grams of potatoes and 100 grams of marshmallows the same size? Do they have different densities? If so, which has the greater density?
3. One bottle labels it has 100 mg of vitamin A in each tablet. Another bottle says it has 0.01 g of vitamin A in each tablet. Which bottle of the tablet contains more vitamin A?
4. Please write scientific notation for each of the following numbers:
 - a. The speed of light in a vacuum 300,000,000 m/s.
 - b. The number of feet in a mile is 5,280 ft.
 - c. Average size of grass pollen is 0.000025 meters.

Laboratory Equipment- Basic Equipment

- **Beaker:** A wide, open container with a flat bottom made of glass or plastic. It is a simple container used to mix, heat, or hold substances.

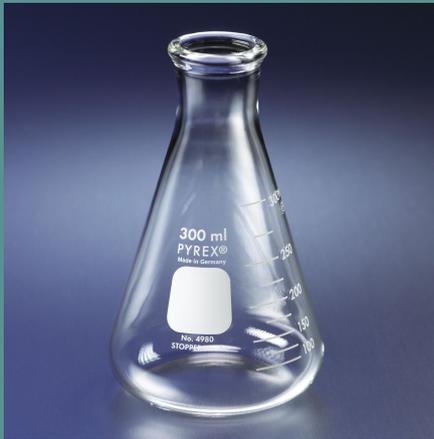


<https://www.amazon.com/Glass-Measuring-Beaker-100ml-Graduated/dp/B01J57WFF6>

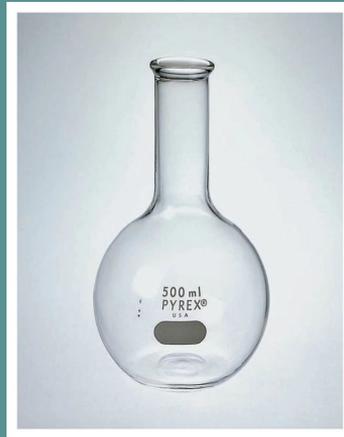
Laboratory Equipment- Basic Equipment

- **Flask:** A glass container with a thin “neck” that widens to a rounded base. Flasks can be used to measure, heat, or store liquids.

Erlenmeyer flask



Florence flask
(boiling flask)



Volumetric flask



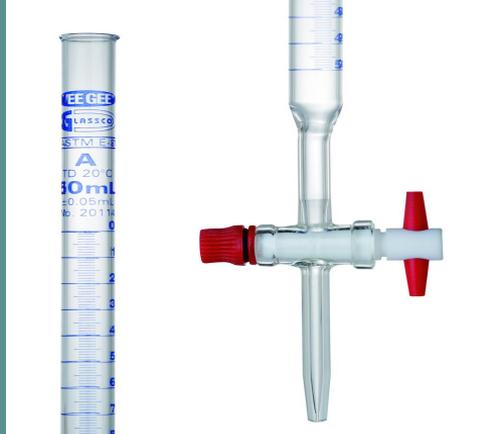
Laboratory Equipment- Basic Equipment

- **Test tube:** A small cylindrical glass tube that has a rounded, u-shaped bottom. It is used to hold or heat small amounts of a substance during laboratory experiments.



Measuring Liquid Volumes

- **Buret:** A long glass cylinder used to accurately measure and dispense a specific volume of liquid. It is often used for titrations, where scientists place an Erlenmeyer flask directly below the tip of the buret and then control the amount of liquid released from the buret.



Measuring Liquid Volumes

- **Graduated cylinder:** A tall, cylindrical container used to measure the volume of a liquid. They are made in many different sizes, ranging from 10 mL to 2,000 mL.



Measuring Mass

- Mass is measured using devices known as **balances**, which measure mass by comparing an object of unknown mass to an object of known mass.

Triple-beam balance



<https://www.drinstruments.com/school-triple-beam-balance.html>

Analytical balance

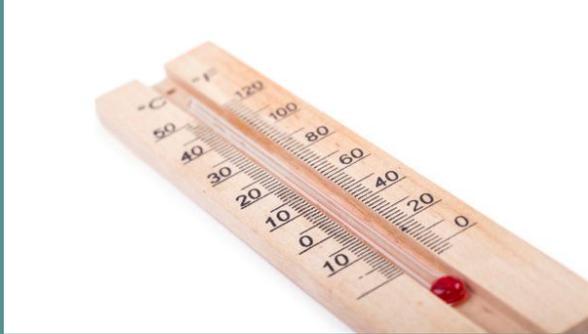


<https://v-medtech.com/>

Measuring Temperature

- **Thermometer:** A device used to measure temperature.

Traditional bulb thermometer



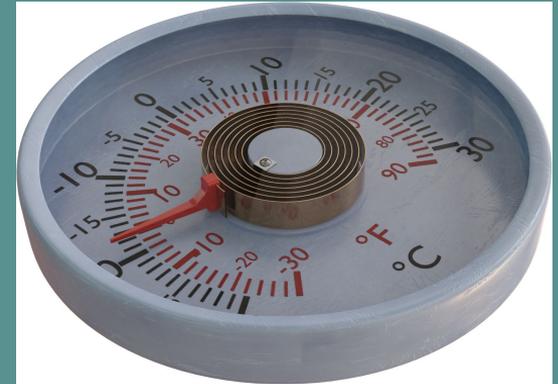
<https://highschoolenergy.acs.org/>

Digital thermometer



<https://www.thomassci.com/>

Bimetallic strip thermometer



<https://www.tec-science.com/>

Transferring Liquids

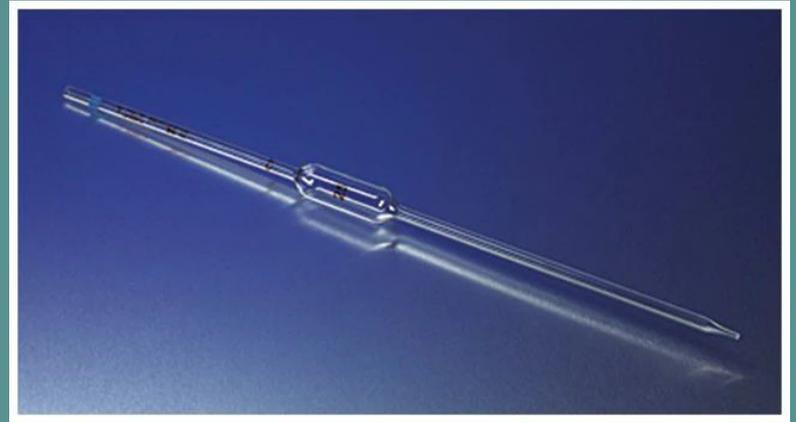
- **Pipette:** A device used to measure and move a liquid from one container to another.

Pasteur pipette



https://en.wiktionary.org/wiki/Pasteur_pipette

Volumetric pipette



<https://www.fishersci.com/>

Heating Materials

- **Bunsen burner:** A gas burner that produces a single, steady flame for laboratory experiments. The flame burns at the top of a vertical metal tube connected to a natural gas source.



<https://www.chemistryworld.com/>