



TeachEngineering

Concrete Composites Lab



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Physical Property Observations Stations

Use the guiding questions below to help you write the descriptions for the Physical Property Observations.

1. **COLOR:** What colors do you see in your concrete samples? Is it the same color throughout? Describe all the colors in detail.
2. **SHAPE:** What is the general shape of your sample? Is it the same shape throughout? Make sure to note any imperfections and deviations from the general shape.
3. **LUSTER:** Is your sample shiny, dull, or somewhere in between? Does it have the same sheen throughout?
4. **TEXTURE:** How does your sample feel? Does it have the same texture on all sides?
5. **PHASE:** What state of matter is your sample?

Physical Property Measurement Stations

Use the charts below and the density formula in our notes to guide your calculations for the average mass, volume, and density of your concrete samples. Do not write on this chart write your calculations on your own paper!

	Mass	Volume	Density
Sample 1			
Sample 2			
Averages:			

Drop Test Station

Follow the directions below to test your samples wettability & reactivity.

1. Set up your phone so that you are able to see your samples clearly. Test your samples one at a time.
2. Record a video on your phone showing yourself use the droppers set up at the station to add a single drop of water, soap, and alcohol on your sample. Make sure that the drops do not mix with each other.
3. Record what happens for three minutes and observe if any changes occur.
4. Replay the video you just took at a faster speed and record your observations on the Chemical Property Table. For wettability, count how many seconds it took for the water to absorb into your samples and describe if your sample is waterproof or not.

Solubility Station

Follow the directions below to test your samples.

1. Break off a small piece of your concrete (this can be done after the strength test). Add your sample to an empty cup and add water.
2. Stir the water with your sample and see if your sample dissolves in the water.

Hardness Test Station

Follow the directions below to test your samples.

1. On the table there is a box of different materials. You will be determining where your sample belongs on the hardness scale by comparing it to these materials.
2. Scratch your concrete with each material.
 - a. If a visible scratch forms on your concrete, then your concrete is softer than that material.
 - b. If the material is not able to form a visible scratch on your concrete, then your concrete is harder than that material.
3. On your observation sheet, record which of the materials were able to scratch your concrete and which were not.

Strength Test Station

Follow the directions below to test your samples.

1. Place your concrete block between the two chairs.
2. Tie a string to the middle of your block where I have scored the concrete.
3. Add weights to the bottom end of the string so that the weight is hanging.
4. Add weights in increments of 5 lbs until your concrete block breaks.
5. Record the lbs that your concrete block broke at on your data table.
 - a. If your concrete block is already broken, then your lbs = 0

Acid vs. Base Drop Test Station

Follow the directions below to test your samples.

1. Test your samples one at a time and test the acid and base one at a time so that they do not mix with each other.
 - a. Hydrochloric acid and bleach are both dangerous chemicals! Be careful not to get it on yourself; if you do *immediately* wash the affected area with soap and water.
 - b. You must wear goggles and gloves at this station. Stay standing the entire time.
2. Use the dropper set up at the station to add a single drop of acid onto your sample.
3. Observe what happens for one minutes and record your observations on the data table.
4. Wash off your sample with water and repeat with the bleach.