Name_____

NATURAL vs. SYNTHETIC Fabrics

Introduction: One of the first things everyone does in the morning is to select clothes to wear. How do we choose clothes? Style? Fit? How about what fabric they are made of? Do you wear polar fleece in the winter and cotton t-shirts in the summer? Do you know what fabric you are wearing today? We can divide fabrics into two categories, natural and synthetic. Natural fabrics come from nature, like wool from sheep and flax from plants to make linen. Chemists have also developed fibers from petroleum that are synthetic or man-made. Nylon, polyester, and spandex are synthetics.

Problem: The Department of Agriculture is trying to come up with a fabric that would help seeds grow in rough climates/conditions. They are looking for engineering designs to ensure seeds have required resources/conditions to grow. Your challenge is to test different fabrics to determine their properties. After performing the tests and doing research online, determine which fabric will be the best to help seeds grow and present that information to the class.

Materials- 1 piece of 6 fabrics, bunson burner, tongs, scissors, timer, large beaker, 1/4 teaspoon.

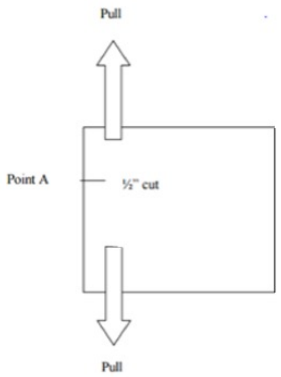
Fabrics- Wool, Silk, Olefin, Nylon, Lyocel, Rayon, Linen, Cotton, Acetate, Polyester, Jute, Polypropylete

Procedures: Do the following tasks for each type of fabric.

1. **Natural or Synthetic**
   - Use a chromebook to research each type of fabric. Find out if it is natural or synthetic.
   - You must use at least **THREE** natural and **THREE** synthetic fabrics for this lab, so research each type of fabric first so that you can pick the appropriate fabrics.

2. **Fabric Description**: Describe the fabrics in the data table (color, feel, stretchiness, thickness, etc).

3. **Tear Description**
   - Make a 1/2 inch cut on the side of the fabric at point A on the fabric (see sketch).
   - With fingers on the edge of the fabric, pull until the fabric tears. Grade the strength of the fabric using a rubric (1 for tears easily and 5 for will not tear at all) and **describe HOW it tears**.



4. **Permeability Description** (use the larger piece of fabric torn from the strength test for the permeability test) Permeability is how much water will soak through the fabric.
   - Lay your piece of the fabric on a piece of paper towel and put 1/4 teaspoon of water in the center.
   - Describe how long it takes for the water to permeate through the fabric (until no 'bubble' of water remains on top of the fabric.)

5. **Burn Description** (use the small piece you have torn from the strength test for the burn test)
   - Fill your large beaker half full of water to extinguish fabric.
   - With the tongs, hold the piece of fabric over the Bunsen burner until it starts to burn.
   - Remove it from the flame and extinguish it in the beaker of water.
   - Describe how it burns and what it looks like while it is burning and after it is burned.

Data:

Fabric Name	Natural Or Synthetic	Fabric Description	Tear Description and (rate 1-5)	Permeability Description	Burn Description
1.					
2.					
3.					
4.					
5.					
6.					

Analysis:

1. What happens to synthetic fabrics when you put them in the flame?

2. How do the natural fibers differ from the synthetic fibers? Provide 2-3 explanations.

3. T-shirts are often made of a 50/50 blend of polyester and cotton. What advantages exist with this type of blend rather than a 100% cotton shirt?

4. What type of fabric would be best used for a table napkin or a bathroom towel? Explain why.

5. What type of fabric would be best used for a sports uniform or jersey? Explain why.

Conclusion:

6. Based on your research, which fabric would you recommend to the Department of Agriculture to use in their seeds? Back up your recommendation with the research you conducted about each fabric's characteristics. (Conclusion must be a minimum of 5 sentences and will be presented to the class.)