**5E Template- Science**

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| **Name: Layne Vickers** | **Date: July 22, 2011** |
| **Content Area: Science** | **Grade Level(s): 6** | **Topic(s): Surface Tension** |

**Standards (SOL)**

**6.1e –** amethod is devised to test the validity of predictions and inferences

**6.1i** – models and simulations are designed and used to illustrate and explain phenomena and systems

**6.5** - The student will investigate and understand the unique properties and characteristics of water

**6.5 b** – the properties of water in all three phases

**Objectives (UKD’s) The students will demonstrate surface tension in water. They will see how surface tension works and how it can be broken. They will see what kinds of objects will “float” on water.**

**Materials & Resources**

* A bowl or other container
* Water
* A needle
* A pin
* A few paperclips
* A toothpick
* A bar of soap
* Thread

**Safety Considerations**

Students will need to be careful with the pins and needles.

**Engage – Time Estimate 3 minutes**

Step right up! Step right up! See the amazing floating pin! I will attempt to float this needle of top of a bowl of water! Is this a regular pin or a “magic” pin? Can she do it?

**Explore – Time Estimate 20 minutes**

Fill a bowl or container to the top with cold water. Carefully place a needle on the surface of the water. If you are careful the needle will remain on the surface of the water. You may need to float a paperclip first and lay the needle on top of the paperclip that has been separated (such that it’s in an L shape). Let students try and float various objects – paperclips (can they float 2?), toothpicks, coated paperclips.

Once a paperclip floats, scratch the soap with one end of the toothpick. Poke the water with the soapless end of the toothpick and see what happens (nothing). Touch the water with the end that has soap and the paperclip will sink. Float a paperclip and touch the water with the bar of soap and the paperclip will “run” away from the soap and then sink.

Float a loop of thread on a bowl of water. Touch the surface of water inside the loop with a bar of soap and watch what happens.

Surface tension is the “skin” of water. Each water molecule acts like a magnet that attracts other water molecules, not only on the surface but below the surface as well. This cohesive force is called surface tension. Soap is a chemical that weakens the cohesive force of water. Soap breaks the surface tension.

**Explain -- Time Estimate 5 minutes**

*Steps to relate learning in the exploration phase to the content being taught. What steps are you going to take to insure that no misconceptions are being perpetuated?*

**Extend -- Time Estimate 10 minutes**

What other objects will float? Find other things like oil that will float on water Can salt float? Sugar? How many paper clips will float at a time?

**Evaluate -- Time Estimate 5 minutes**

If students demonstrate surface tension and then break surface tension, then they will be successful.

**Plans for Diversity**

All students should be able to participate in this activity.

**Connections**

Properties of water are a key theme in sixth grade science. It’s always fun for students to experience surface tension, from floating a paperclip to having them see how many paperclips they can fit in a full container of water. Science is fun!