

FRANKLIN COLLEGE

Education Department

Field School Lesson Plan

Name Amanda Welches

Lesson Number 4

Subject Area Science

Grade Level Fourth

Date March 21, 2012

Start Time      End Time

Cooperating Teacher's Signature \_\_\_\_\_

Topic/Concept/Skill: Surface Tension

Related Standard:

Background: The students should know properties of water.

Main Objective of Instruction: The student will be able to understand how surface tension varies.

Teacher Materials/Resources: 45 pennies; available water; small containers of water, oil, and soapy water; a pipette for each of the containers; a square of wax paper, gallon of whole milk, food coloring, 15 plastic bowls, Q-tips, 15 pie pans, container of pepper, bottle of dawn soap, toothpicks

Student Materials: pencil

Anticipatory Set (Introductory Approach): I will begin by showing the video of *Basilisk Lizard* (*Jesus Lizard*)

Instructional Procedures (Whole Group):

1. After the video I will ask the students, "How is it possible that the lizard ran on the water like that?"
2. We will discuss how it is possible and conclude that it is because of the surface tension.
3. I will pass out the hand out for the students to complete while doing the lab on surface tension.
4. The directions are on the lab.

Provisions for Individual and/or Group Differences:

- I will ask more leading question to those who are struggling.

Closure: I will show a video of examples of the milk and food coloring experiment.

Evaluation of Learning: I will collect the lab hand outs and put a check on them if they completed it correctly.

Independent Practice: None.

## Surface Tension

Name \_\_\_\_\_

### Purpose

The purpose of this lab is to investigate the property of the surface tension of water. This lab will look at the way that water sticks to itself to make a rounded shape, the way that water behaves as a “skin” at the surface, and a comparison of water’s surface tension with two other liquids, oil and soapy water.

Make observations of the penny prior to starting the activity:

You will be carefully placing drops of water on the penny one at a time. How many drops of water do you think you can place on the penny before it runs off?

\*\*see who can get the most drops on their penny

Liquid	Predicted # of Drops	Number of Drops
Water		
Oil		
Soapy Water		

### Comparing the Shape of a Drop

- A. Drop a small sample of water on the wax paper. Draw the shape and label the shape of the drops.

What happens if you take a toothpick and place the drops very close together?

- B. On another piece of wax paper, drop a small sample of oil. Draw the shape and label the shape of the drops.

C. On another piece of wax paper, drop a small sample of soapy water. Draw the shape and label the shape of the drops.

D. On the wax paper where you dropped water, drop a few oil droplets and move the oil drop next to the water. What happens?

E. Dip a toothpick in soap water. Place the soapy tip in a water drop. What happens? Why?

- Cohesion is the molecular attraction exerted between molecules that are the same, such as water molecules.
- Adhesion is the molecular attraction exerted between unlike substances in contact.  
\*\* Cohesion causes water to form drops, surface tensions causes them to be nearly spherical, and adhesion keeps the drops in place.

Can you figure out WHY?

1. Pour water into a dish and sprinkle pepper on top of the water (all over). Take a toothpick and dip it in dishwashing soap. Place the toothpick in the pepper-covered water. Draw what happens. Tell why.
  
  
  
  
  
  
  
  
  
  
2. Pour whole milk into a dish. Drop a variety of colors of food coloring on the milk. Take a toothpick and dip it in dishwashing soap. Place the toothpick in the food coloring-covered milk. Draw what happens. Tell why.