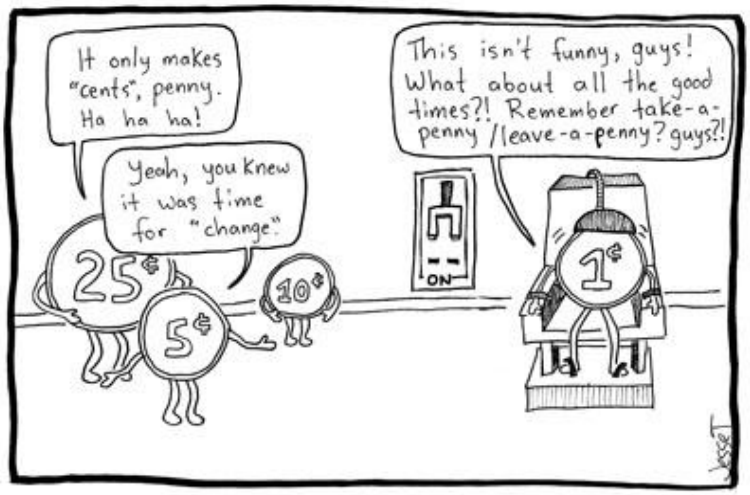
Penny Lab /20

Name: _____

Partner(s): _____



When faced with a problem, it is up to you, the scientist, to form a hypothesis, come up with a procedure to test the hypothesis, perform an experiment by carrying out the procedure and recording all of your results and possible errors so you can come up with a conclusion or further hypothesis.

Safety:

- Wash your hands and equipment thoroughly after completing this activity
- Safety glasses and aprons must be worn

Materials:

- Penny
- Dropper
- Beaker
- Thermometer

Problem: How many pennies can Schaub drop into a cup full of water before the water overflows?

Background information: Water has some very special properties. Mainly, water has a very high surface tension and cohesion. Cohesion means that water molecules are very attracted to each other. You could say, "they stick together". Surface tension is the name given to the cohesion of water molecules at the surface of a body of water. This cohesion could be thought of like a "blanket" holding the water molecules within.

Initial Prediction: _____ (IN PEN ☺)

At this point your initial prediction may be a lot more like a guess then a prediction because if you haven't done anything like this before how are you supposed to come up with an educated guess. Scientists often do smaller experiments to get an idea of the results in a bigger experiment.

In your table groups you will solve the following problem:

On average, how many drops of water can fit on one side of a penny?

After solving this problem please take a moment for your revised prediction:

Revised Prediction: _____ (IN PEN ☺)

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Problem: On average, how many drops of water can fit on one side of a penny?

Hypothesis: *If* I place water on a penny one drop at a time using a water dropper, *then*, because of the large cohesion and surface tension of water a penny should be able to support on average between _____ and _____ drops of water.

Procedure: (Briefly explain in this space how you will test your hypothesis. Your procedure should be organized into a list of steps)

5 marks

Self-evaluation score: /2.5

Score from Schaub: /2.5

Category	Excellent (2.5)	Good (2)	Satisfactory (1.5)	See Schaub (1)
Procedure	My procedure could be carried out by another group without help. All steps are clearly organized and in a logical order.	My procedure could be carried out by another group with minimal help. Steps are organized and in a logical order.	My procedure could be carried out by another group but they would need some help from me. The procedure touches on mostly everything I did.	The lab could not be carried out by another group and I am not sure what I did.

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Results: (Organize and present your results as you consider most appropriate) (5 marks)

Self-evaluation score: /2.5

Score from Schaub: /2.5

Category	Excellent (2.5)	Good (2)	Satisfactory (1.5)	See Schaub (1)
Results	My results are clearly laid out and organized using an appropriate format (Example: a table, a chart, or colour scale, etc.) My results could be understood by someone who didn't do the lab.	My results are organized using an appropriate format (Example: a table, a chart, or colour scale, etc.) My results could mostly be understood by someone who didn't do the lab.	I have shown my results however I would probably have to explain them for them to be clearly understood.	My results are disorganized and even someone who did the experiment probably couldn't understand what I have written.

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Conclusion: (Did your experiment answer the question? What would you change if you did it again? What were some possible errors which may have affected the results? Any other significant observations or results)

(5 marks)

Self-evaluation score: /2.5

Score from Schaub: /2.5

Category	Excellent (2.5)	Good (2)	Satisfactory (1.5)	See Schaub (1)
Conclusion	My conclusion re-iterates my question and answers it. In my conclusion I list possible sources of error and suggestions for the next time I attempt the experiment.	My conclusion answers the question. In my conclusion I touch on possible sources of error and show evidence of suggestions for what I would change the next time I attempt the experiment.	My conclusion answers the question.	My conclusion does not clearly answer the question.

Self Evaluation:

Core Competencies: **Being a scientist goes far beyond getting results. So much of being a scientist is about working well with others, relationships and communication. Please evaluate your social, teamwork and communication skills. (2.5 marks)**

Category	Excellent	Good	Satisfactory	See Schaub
Team work and communication	My team did well on the lab. We tried to make sure everyone felt involved and understood the concepts.	For the most part my team and I worked together on the lab and we all understood most of the concepts.	For the most part my group members and I worked together on the lab and I understood all of the concepts.	I did well on the lab and I understand the concepts.
Personal and social	My team and I worked well together and created a positive learning environment for all members of the team. We were social and got to know each other better.	My team and I worked well together and created a learning environment that was mostly positive. We were somewhat social.	My team and I focused on getting the activity finished quickly. The learning environment was neutral. We did not argue and got the lab done, which was the point.	I was not with my friends for this activity so I spent most of my time talking to the group that had my friends in it. My group and I got the lab done which was the point of the activity.

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