

## Penny Lab: Exploring Scientific Method



# Title

- *Examination of changes in surface tension of a liquid between water and water with soap added*
- *The effects of soap on the surface tension of water*
- *How soap affects the number of drops of water that can fit on a penny*

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See Page 36. THE See Page 38.

# GOLDEN PENNY.

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"READY, AYE READY!"  
See Page 46.

## Purpose/Question

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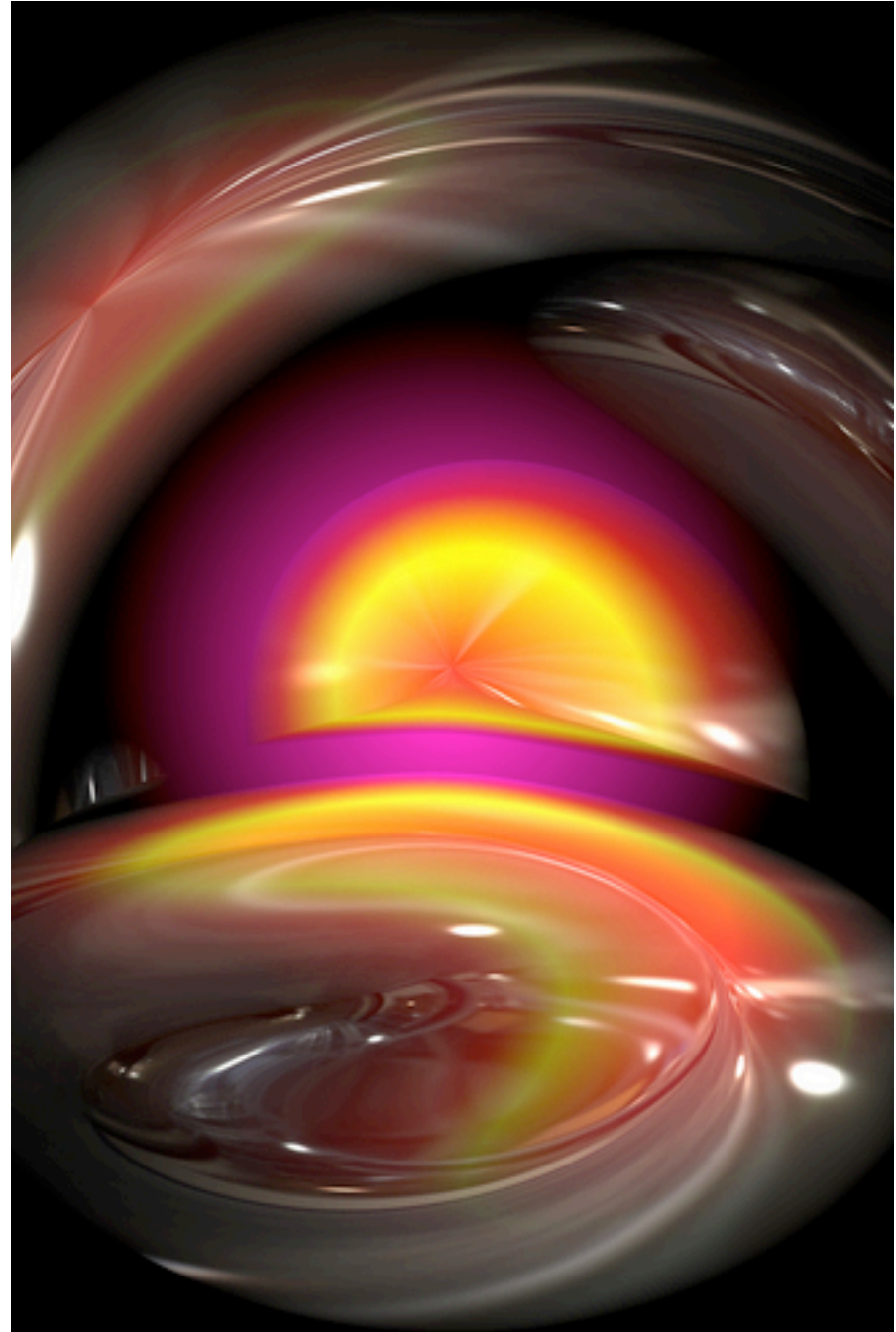
- Does adding soap to a penny reduce the surface tension of the water being added?
- How does adding soap to a penny affect how many drops can fit on it?



# Hypothesis

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- ***If soap is added to a penny, then I think more drops of water will fit on the penny***



## Variables

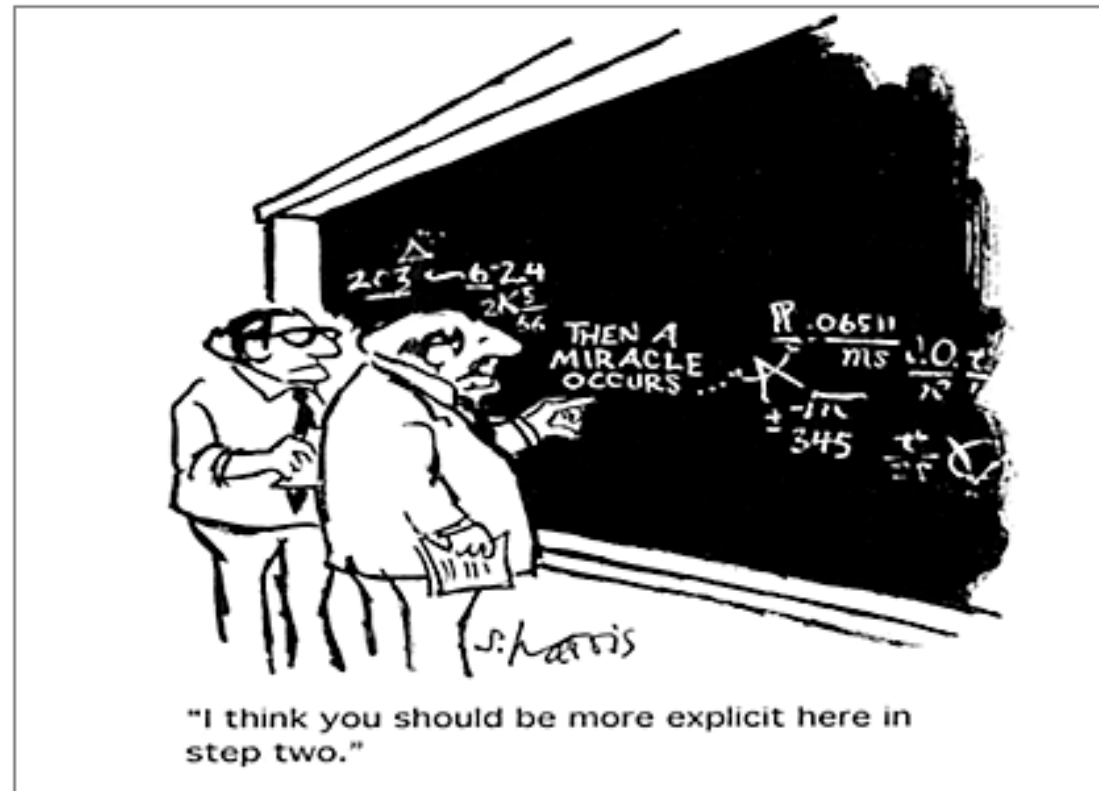
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- **Independent** – *the addition of the soap (what is added, or the “treatment”!)*
- **Dependent** - *number of drops of water that are able to be added (what is in the data table!)*
- **Control:** *adding water to the penny without soap*



# Procedure

- **Step by step instructions**



# Materials

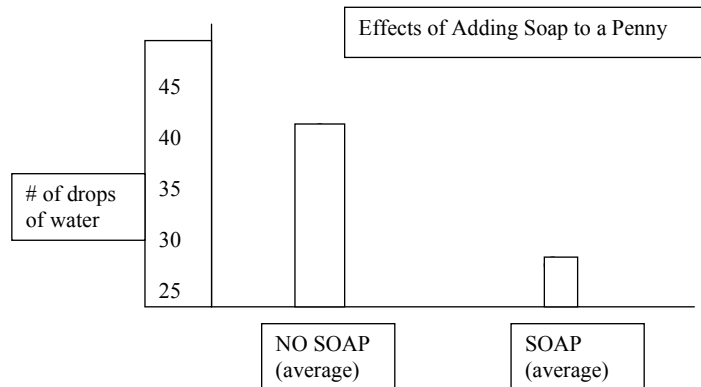
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- *penny, soap, water, 1 ml pipette, forceps*



No soap added	Trial 1	Trial 2	Trial 3	Trial 4	Average
# of drops	37	45	39	42	40.8

Soap added	Trial 1	Trial 2	Trial 3	Trial 4	Average
# of drops	23	28	32	22	26.3



Data & Graph



## CEE (Claim, Evidence, Explanation)

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Claim

**With soap on penny, fewer  
drops of water can be added!**

## Evidence

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**Average for no soap on penny  
is 40.8 drops of water**

**Average with soap on penny  
is 26.3 drops of water**

## Explanation

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**Because soap reduces cohesion of water, surface tension decreases and water molecules break apart and can't stay on the penny**

# Vocabulary

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**surface tension**  
**cohesion**  
**variables**

## Hypothesis Refuted or Supported?

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**My hypothesis was supported.  
Soap did decrease the number of drops  
of water that could be added**

# Errors

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**I believe that we added too  
much soap to the penny**

## Further Investigations

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**In the future, I will examine if other items reduce the surface tension of water**

# Analysis

## CEE

