

Scientific Method I

Qualitative and Quantitative Observations

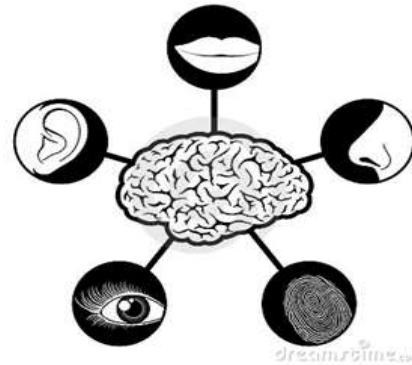
Scientific Method

Qualitative and Quantitative Observations

Observations can (in general) be divided up into:

Qualitative **observations**

**use your senses to
observe the results.**



QuaNtitative **observations**

are made with instruments
such as rulers, balances,
graduated cylinders, beakers,
and thermometers.

These results are **measurable**.

(numbers)



Activity!

Identify if the following observations are
QUALITATIVE or **QUANTITATIVE**

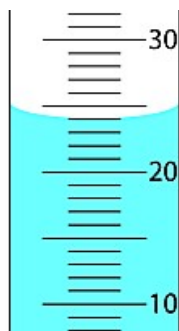
Question 1

The coffee is black.

Qualitative!

Question 2

The volume of the liquid is 24 mL



Quantitative!

Question 3

The metal is shiny.

Qualitative!

Question 4

The liquid in the thermometer is red.

Qualitative!

Question 5

The ruler has a length of 30 cm.

Quantitative!

Question 6

The bell rings three times per minute.

Quantitative!

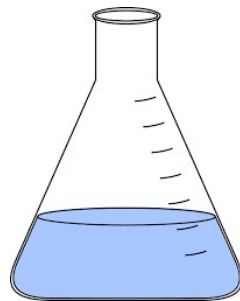
Question 7

It's 1:30pm

Quantitative!

Question 8

The liquid smells like vinegar.



Qualitative!

Question 9

The car is traveling at thirty
kilometers per hour

Quantitative!

Question 10

There are twenty five students in this room.

Quantitative!

Video

- <https://www.youtube.com/watch?v=dwFsRZv4oHA>

Reflection...

Reflect back on your day so far. List 5 QUALITATIVE and 5 QUANTITATIVE observations.

Next...

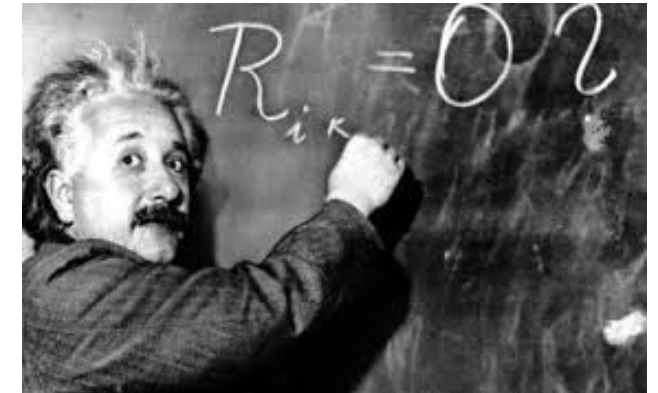
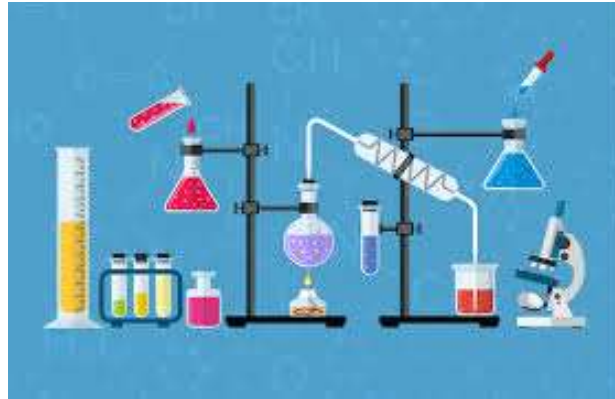
Next, choose an object on your desk. List 5 QUALITATIVE and 5 QUANTITATIVE observations.

Activity:

Determine whether the following are qualitative or quantitative observations by circling the appropriate answer:

EXAMPLE:	OBSERVATION
1. There are 5 holes in the box.	QUALitative or QUANTitative
2. The liquid is in a red container.	QUALitative or QUANTitative
3. The bracelet is blue.	QUALitative or QUANTitative
4. The chemical reacts with water.	QUALitative or QUANTitative
5. The time is 6:45pm.	QUALitative or QUANTitative

How do
scientists
make their
discoveries?



Video

- https://www.youtube.com/watch?v=Xowen_a787Y&ab_channel=Reactions

Scientific Method

SCIENTIFIC METHOD

PURPOSE

State the problem.

RESEARCH

Find out about the topic.

HYPOTHESIS

Predict the outcome to the problem.

EXPERIMENT

Develop a procedure to test the hypothesis.

ANALYSIS

Record the results of the experiment.

CONCLUSION

Compare the hypothesis to the experiment's conclusion.

PURPOSE

State the problem.

- What is the purpose of this experiment?
- What do we want to figure out?

RESEARCH

Find out about the topic.

- What other experiments have taken place?
- Are there any limitations or other possibilities to what you want to discover?

HYPOTHESIS

Predict the outcome to the problem.

- What do you think is going to happen?
- If..., then...
- Example: If a plant receives water, then it will grow faster.

EXPERIMENT

Develop a procedure to test the hypothesis.

- What are the steps that must be taken for this experiment?
- Consists of an extremely detailed list of materials necessary as well as a detailed list of steps for the procedure

ANALYSIS

Record the results of the experiment.

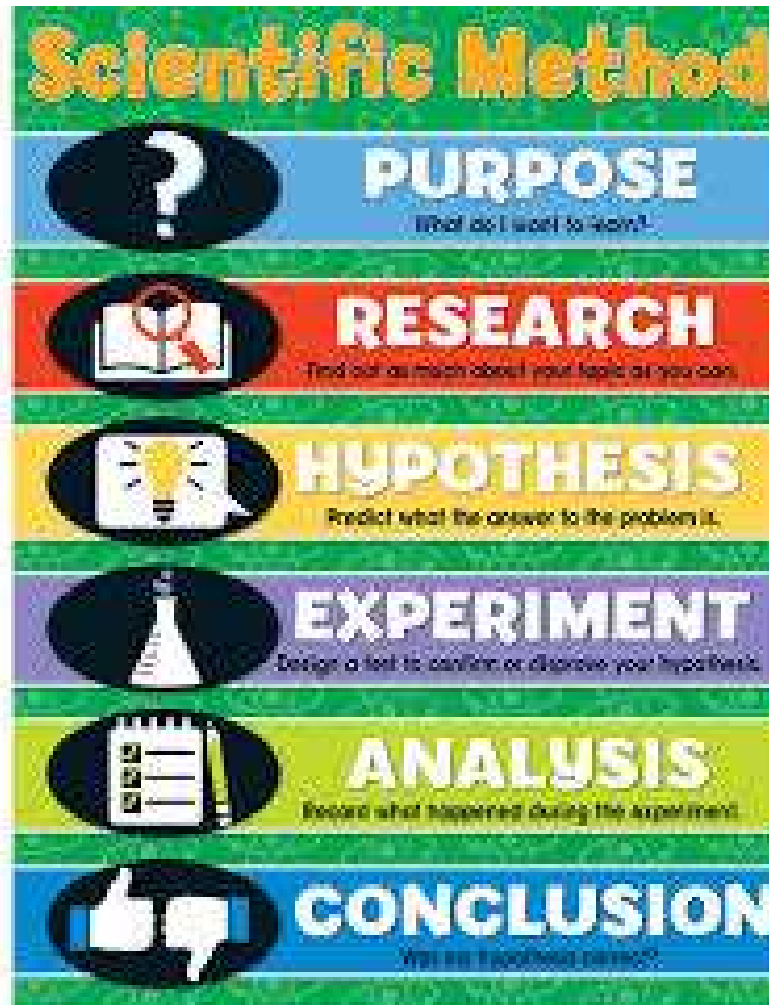
- What results occurred from your experiment?
- Must have results from the original conditions.
- Compare to results from when the change was made.

CONCLUSION

Compare the hypothesis to the experiment's conclusion.

- What did you discover?
- Was your hypothesis supported or not supported?
- What factors may have affected your result?
- If you were to redo the experiment, what changes would you make?

Video



<https://www.youtube.com/watch?v=qAJ8IF4HI2o>

Brain Break

Statue Challenge:

Stand on your left foot.

Hold your right leg parallel to the ground in front of you.

Put your left hand on your left hip.

Grab your left earlobe with your right hand.

Hold this pose as long as possible.