

Day 1

What is a scientist?



Record some words at your team that describe scientists and sort them into categories.

Have you ever wondered about things such as:

 Why does the Sun shine?



 How do plants grow?



 How does my body work?



If so, you know where science begins.

When something happened more than twice (two times) such as the Sun shining that is where science begins.

A lot of children and adults
think a scientist looks like this...



But.....

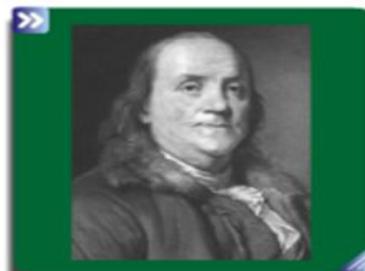
Scientists can be...



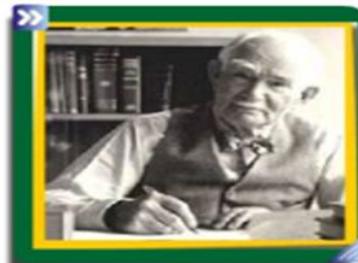
Dr. Sally Ride was the first American woman in space. Her first space mission was aboard the shuttle Challenger in 1983.



Edward Bouchet was the first African American to graduate from Yale in 1874. Following graduation from Yale, Bouchet taught chemistry and physics for 26 years at the Institute for Colored Youth in Philadelphia.



Benjamin Franklin proved that lightning is a form of electricity with the famous, and very dangerous, kite experiment which led to the discovery of positive and negative electricity.



Lee De Forest invented what he called the "audion tube," or vacuum tube, in 1906 that helped put radio and television broadcasts "on the air." He also developed a way to put sound on film.

Even you can be a Scientist!



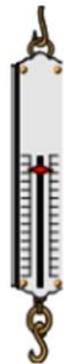
But you have to follow the scientific method!

Scientists have tools they use as well.



These tools help scientists see things up close so they can make detailed observations.

Scientists also have to use scientific tools to help them observe, measure, and record information.



Microscope

Telescope

Binoculars

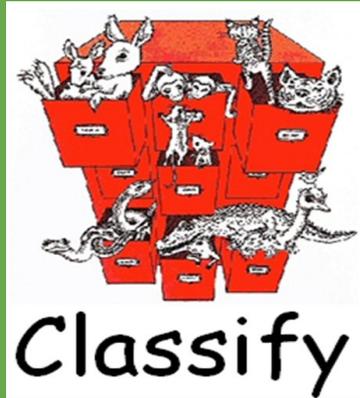
Spring Scale

Magnifying Glass

Thermometer

Measuring Tape

Skills scientists use:



Science isn't just knowing that something happens
again and again

but,

Asking the questions:

How

Why/Why Not

Where

When





Look around your world and think,
What questions do I have?

A scientist works to find the answer to these
common, everyday questions.

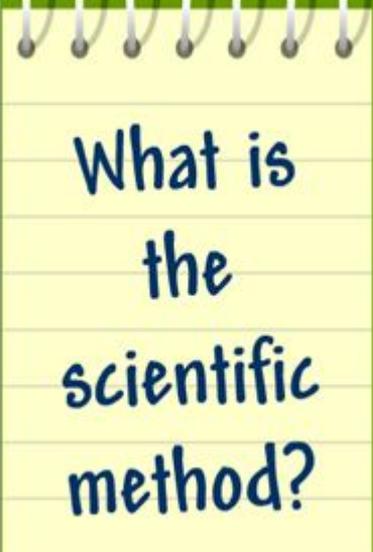
Science Left Side Assignment

Directions: Based on what you learned in class, draw a picture of a scientist and show what scientists do. Remember your left side should show your understanding of the right side of your notebook. Be sure to:

- Include both pictures and words (vocabulary from the lesson)
- Include some tools that scientists might use
- Include the skills that a scientist uses (observe, predict, find a pattern, measure, classify)
- Use lots of color! (Remember not a lot of white space)
- Be creative!
- Be neat
- Try to get the WOW factor by exceeding the expectations!

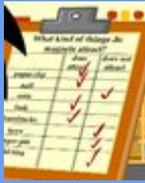
Day 2/3

SCIENTIFIC METHOD



What is
the
scientific
method?

The scientific method is a set of steps that scientists follow to test their ideas. The first step is to make observations and think of a question we want to ask. The second step is to make a hypothesis. When you make a hypothesis, you use what you know to make a prediction. The next step is to do the experiment and test our hypothesis. First you have to plan your experiment and then gather your materials.



SCIENTIFIC METHOD

SCIENTIFIC METHOD

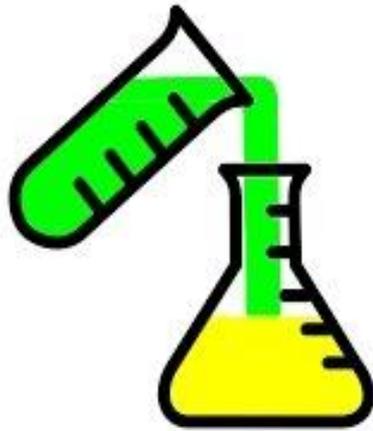
1. Ask a question.
2. Make a hypothesis.
3. Do the experiment.
4. Draw a conclusion.
5. Share what you learned

Then you have to make your tests in the same way so you get accurate results. You must record your data too. Data is information that you can record, like what you observe during an experiment. Sometimes you can record your data with a chart. The next step of the scientific method is to look at your data and draw a conclusion. The last step of the scientific method is to share what you learned with others.

How do
you do an
experiment?

How can
you record
data?

How do
you draw a
conclusion?



The Scientific Method

Scientific Method



The Scientific Method

- Some of the most important discoveries have come about as a result of questioning why things are the way they are. That is how science begins. In order for scientists to investigate and answer questions about the natural world that surrounds them, they have to **follow a series of steps called the Scientific Method.**
- Scientific Method is like a road map that scientist use in order to understand how things **work** and **why** they work they way they do.

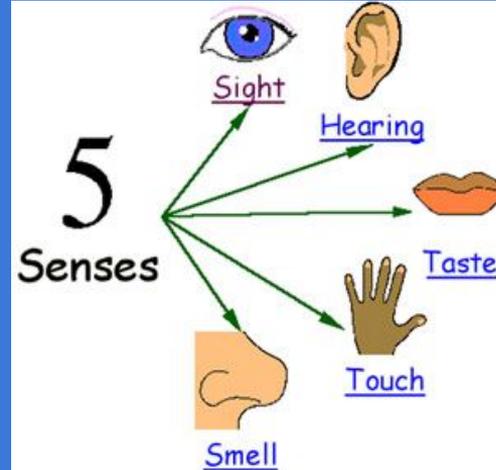
Observation

- When using the scientific method, one of the first steps is:

1. **Observations**- gathering information on a topic of interest.

This step comes natural to most people. It involves using the 5 senses:

1. See
2. Hear
3. Taste
4. Touch
5. Smell



Problem

- The next step is to come up with a **Problem!**

2. **Problem:** Or Good Question to be answered. Ask yourself question that interests you and what you would like to learn more about.

Does something seem strange to you? Do you want to find out how something works? Questions should be clear and testable, not opinions or questions that test more than one thing.



Hypothesis



- Next step of the Scientific Method has the scientist to form a **Hypothesis**.
3. **Hypothesis** : A possible solution to the problem. This is when scientists use what they already know and have observed, to say what they believe the outcome of the experiment will be.
- Hypothesis is simply a prediction of what you think is going to happen.
 - If a hypothesis does not match a scientist's results, this does not mean the experiment was a failure.

Experiments

- Most important and exciting step of the Scientific Method.

4. **Experiments**: Scientist design and carry out tests or trials, that will help them determine if their hypothesis is correct.

This step requires scientists to write down clear and correct procedures and steps to follow, and keep a list of materials used.



Results

- Scientists work on experiments, collecting data and making observations.
- This information is known as the results.

5. **Results**: data, recorded observations, careful records collected during the experiment.

Data can also be in the form of notes, tables, pictures, charts, and even graphs.

Conclusion

- 6. **Conclusion**: Final step of the Scientific Method.
- Conclusion involves analyzing and summarizing the results.
- Scientists decide whether or not the data found supports their original hypothesis.
- If results do not support the hypothesis, scientist DO Not go back and change their predictions.
- They will try to figure out what might have been wrong with their hypothesis.

Scientific Method Left Side Assignment

Create your own experiment using the scientific method.

Think about the questions, steps, and methods you will need to conduct the experiment.

Be creative and full explain your experiment using color.

Day 4



Observations and Inferences

Observations are what you notice

Inferences are your reactions, thoughts or explanations



Observation vs Inference

Any information collected with the senses

Quantitative - measurable or countable

- 3 meters long
- 4 marbles
- 50 kilograms
- 35 degrees Celsius

Qualitative - describable, not measureable

- red flowers
- smells like fresh baked cookies
- tastes bitter

Conclusions based on observations.
The process of drawing a conclusion from given evidence.

Practice:

Observations:

- I hear people screaming
- I smell cotton candy, popcorn, and hamburgers
- I see a lot of people

∅ **Inference** = ?

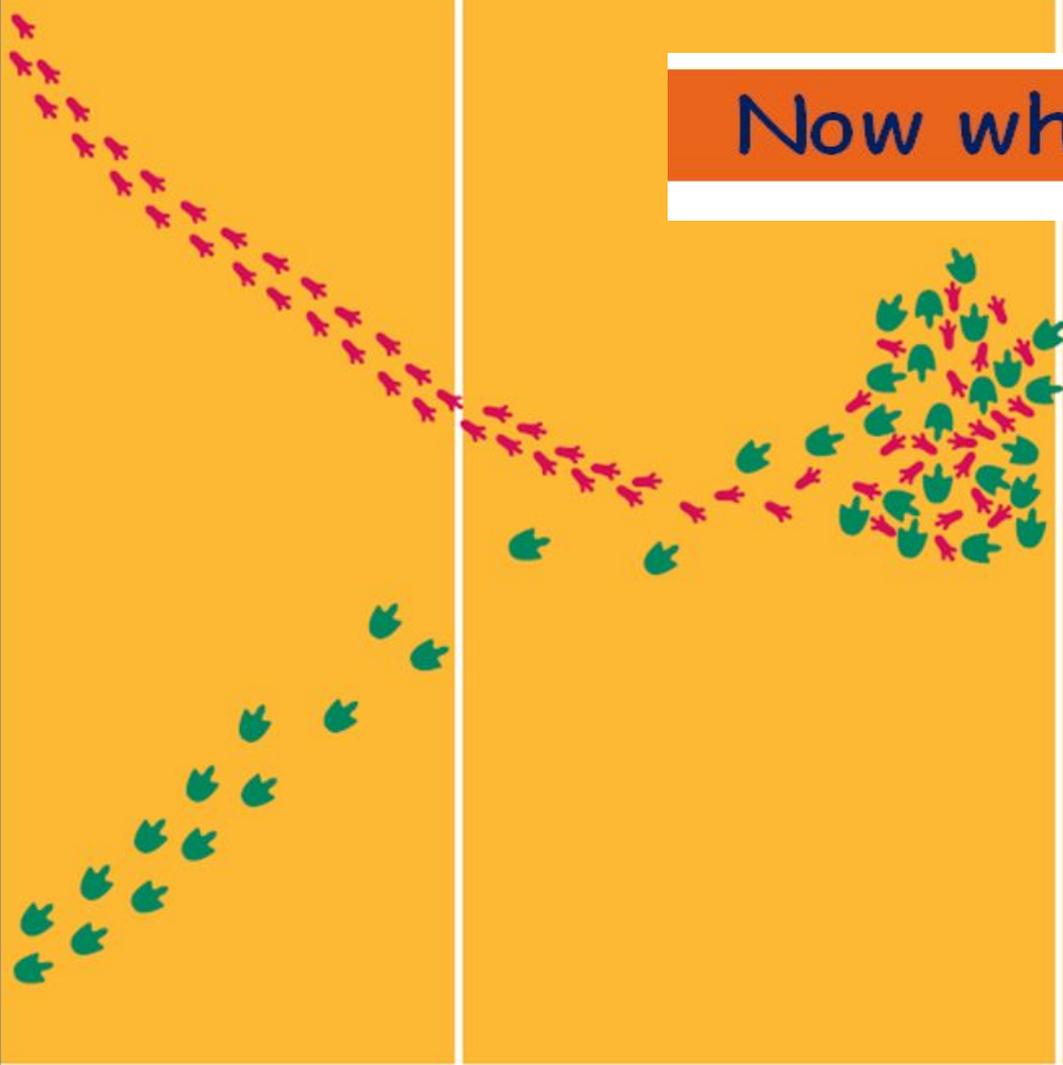


Look at these two sets of
animal tracks.

Name 3 **OBSERVATIONS**

Make an **INFERENCE**

Now what do you think?



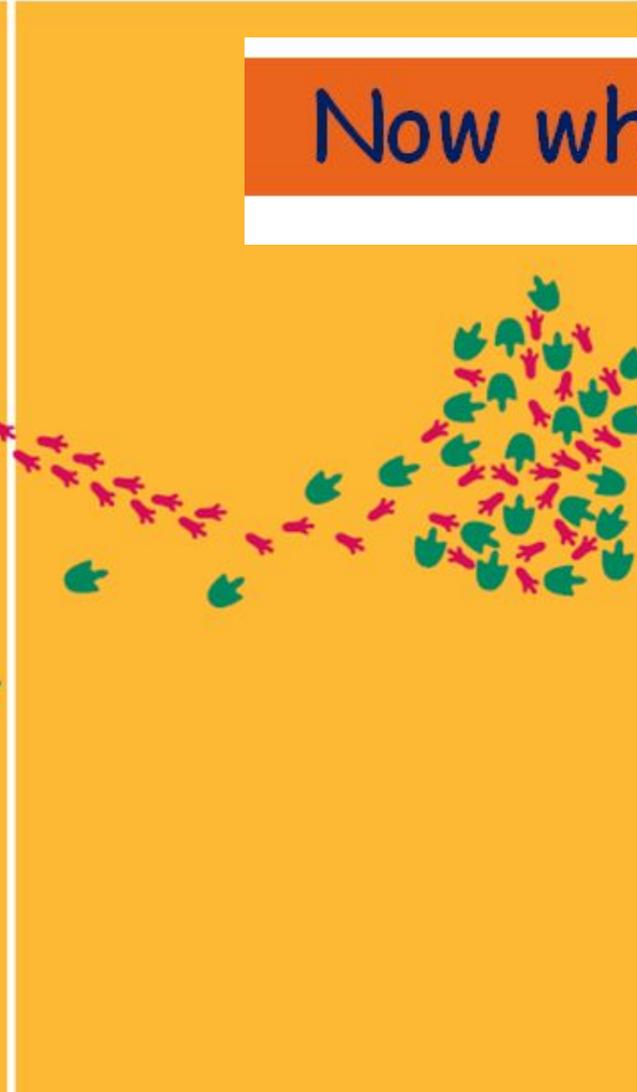
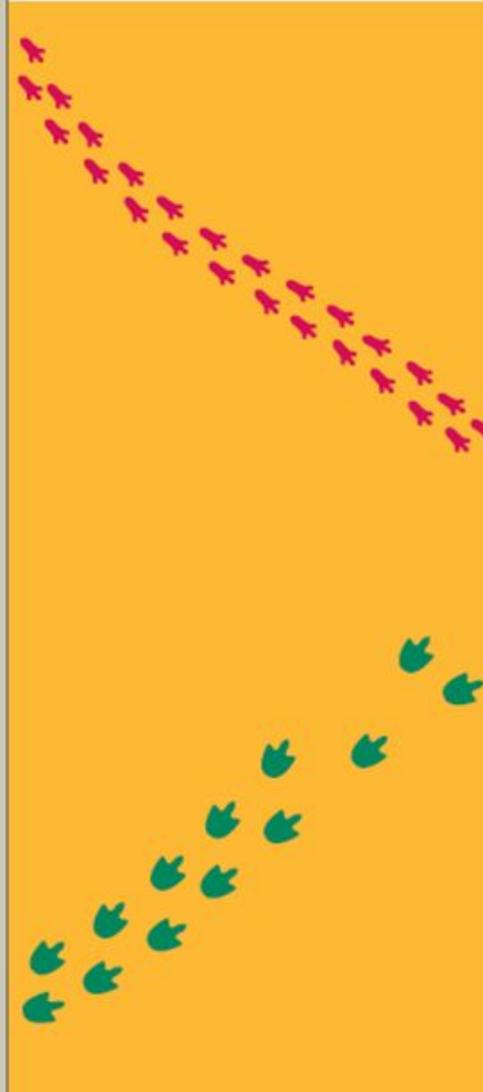
Make 3 OBSERVATIONS

Make an INFERENCE

Now what do you think?

Make 3 OBSERVATIONS

Make an INFERENCE

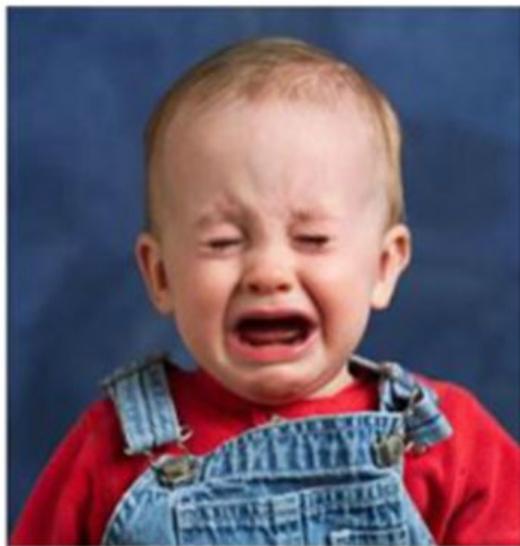


Picture	Observation	Inference
1.		
2.		
3.		



Write one
observation.

Write one
inference



Write one
observation.

Write one
inference

Write one
observation.

Write one
inference



Observation/Inference Left Side Assignment

Create your own observation/inference picture. Share with a partner at your table.

Be creative!

Day 5

Materials:

- ▶ plastic cup
- ▶ two Gummi Bears
- ▶ water, vinegar
salt water, oil
- ▶ ruler
- ▶ note cards
- ▶ Recording Sheet





Research: Gummi Bears Fun Facts

Gummi bears are usually an average of 1/2 inch in length and come in an assortment of colors that include red, orange, green, yellow and translucent. Traditional flavors include raspberry, orange, strawberry, pineapple and lemon.

Gummi bears were originally named Dancing Bears by creator Hans Riegel . Red is the most popular and favored color of gummy bear candy.

<http://gummybears4ever.weebly.com/fun-facts.htm>

What will happen if I
place a gummy bear in
water, salt water, oil, and
vinegar?



Hypothesis

If I place Gummi Bears in _____ then...

1. If I place Gummi Bears in water then ...
2. If I place Gummi Bears in vinegar then ...
3. If I place Gummi Bears in salt water then ...
4. If I place Gummi Bears in oil then ...



Procedure

1. Pour water in cup until about half full.
2. Place one Gummi Bear in the water.
3. Place second Gummi Bear on note card.
4. Trace the Bear on the card.
5. Using the centimeter side of the ruler measure the bear traced on card.
6. Record measurement in journal.
7. Let Bear remain in water for several hours.
8. Remove Bear from water and dry.
9. Place Bear on note card and trace.
10. Measure Bear traced on card.
11. Record findings in journal.



