PHYSICS notes at Layton High School, Utah by J. Lindsay

I. Observation (Day #1)

A. Introduction:

1. Much of what you know about the world around you was discovered by Physicists.

a. People whose job it is to find out how nature works.

b. Look for clues about what is happening and how it happens.

c. They ask questions and think of possible answers.

d. They test ideas with experiments.

e. They measure the tiniest bits of matter and the distance from the earth to the edge of the universe.

2. The observing, questioning, experimenting, and measuring that physicists do lead to knowledge.

B. Observation:

1. Observing is not just for scientists.

a. A golfer has to see the hole to sink a putt. The golfer also has to know which way the wind is blowing, which way the green slopes, and which way the grass is bent.

2. Physicists carefully observe the world around them.

a. They look for something they don't already understand as a place to start working.

b. When physicists explain something beyond what was already known, they have expanded the boundaries of knowledge.

3. Observing carefully enough to discover the unexplained is the key to working in science.

4. But to use your observations you must tell someone else what you saw.

a. If you can't communicate, then all your observation and discoveries are useless.

C. Questions:

1. What is every physicist's job?

2. What are some ways scientists find out about how nature works

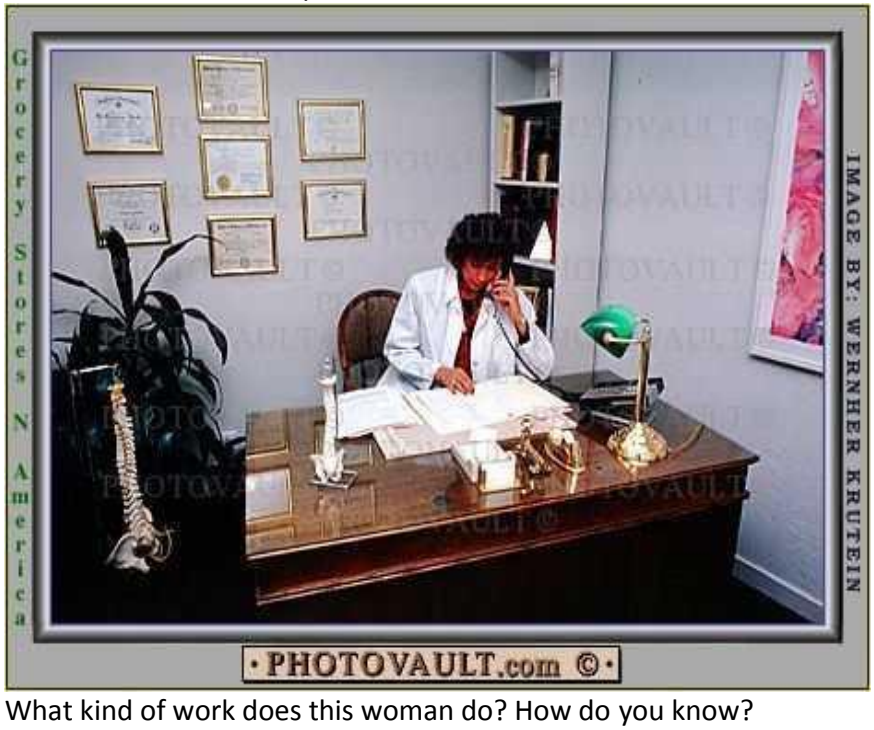
3. What is this a photograph of?
4. How do you know? The picture is not what you probably thought it was as first glance.
5. What tells you what is happening?
6. Look at the following sketch:

Was this a party celebrating New Year's, a birthday, Halloween, Valentine's Day, or Thanksgiving? How did you know?

7. Look at the following photo:

What kind of team sport used this room last? How did you know?

8. Now look at the next photo:



What kind of work does this woman do? How do you know?

9. What did you have to do with all of these pictures to answer the questions?

10. What must a Physicist do to study nature?

11. List some other jobs in which observing is important?

12. What must you do to know what is going on around you?

D. Activity: Observation, Description and Identification

(Paper bags, assorted objects

1. Each pair of students will be given a paper bag full of objects. Do not show the contents of the bag to anyone.

2. If you are chosen to go first, take out one object. Be careful not to let the rest of the class see it. Describe what the object looks like to the class with one descriptive term. Do this without actually naming the object.

3. The rest of the class can now look in their bags. When students have heard the one word description, they should pull it out of their bags and hold it up.

4. Take turns describing other objects from the bag with a one word description. See how fast the rest of the class can guess which object is being described.

5. Scientists keep records of what they see. Practice carefully recording what you have seen.

6. Write down what each of the things in the bag looks like. Be sure you describe, not name, each item in you sack.

7. To test how well you can describe things, take turns reading your descriptions aloud. See if other students can pick out the right object by listening to your description.

8. Did all students guess correctly the first time?

9. If they did, what helped them? If they didn't, what was missing?

10. When the descriptions were written down, did everyone guess the answer quickly?

11. When the descriptions were written down, what did everyone need for a correct answer?

E. Key Facts and Concepts

1. The first step in understanding nature is careful observation

2. The Physicist's job is learning how nature works.

3. Physicists observe, question, experiment, and measure.

4. The search for knowledge about how the world works, as well as the knowledge itself, is called Physics.