

Science Process Skills Notes

Test review

Students should be able to match the word to the definition, and be able to identify each skill demonstrated when given a statement.

1. **Observing** – use your senses to learn about something.

sight

color

shape

sound

volume-

loud/soft

touch

texture-

smooth/

smell

sweet

sour

taste

sour

sweet

2. **Communicating** – using words or pictures to share information

saying it – talking, skype, talking on phone

writing it down – paper, texting, emailing, graphs, charts, diagrams

3. **Classifying** – group (sort) objects or events according to some method – use properties or characteristics.

Properties – ways (qualities or characteristics) that are used to classify things, events or people.

Characteristics – things that make people, objects or events different from each other.

Examples – color

size

shape

texture

appearance (how it looks)

4. **Measuring** – use (metric) units to describe objects

size – length

- measure in meters

width

centimeters

height

millimeters

weight – measure in grams

use scale

volume – the amount of space something takes up – measured in milliliters or meters³

5. **Inferring** – make a reasonable guess to explain observed events

6. **Predicting** – to form an idea of a future event after studying evidence

7. **Control variables** – change one factor that may affect the outcome of an event (experiment) while keeping other factors the same.

8. **Estimating** – use judgement to state how much, how long or how many.

9. **Making Graphs** – use diagram to show quantities

10. **Scientific Method** – the process a scientist uses to solve a problem:

1) Ask a question (problem)

2) Form a hypothesis

3) Design an experiment

4) Collect and analyze Data

5) Form a conclusion – communicate results

Read the following story:



Mr. Smithers needs to increase how much work gets done by his employees every day or he will get a demotion back to the mailroom by Mr. Burns. He has noticed that two of his employees that drink "Pitbull" juice seem to get more work done than all of the other employees every day. He thinks that this juice will increase the productivity of his workers. He creates two groups of 50 workers each and assigns each group the same task (they have to staple a set of papers). Group A is given the "Pitbull" juice to drink while they work. Group B is not given the juice. After an hour, Smithers counts how many stacks of papers each group has made. Group A made 1,587 stacks, Group B made 2,113 stacks. Mr. Smithers is convinced the juice increases how much work the employees get done. In order to convince Mr. Burns that he should spend the money and buy "Pitbull" for all of the workers, Mr. Smithers makes a graph showing the number of papers stapled every 5 minutes by each group of workers. He takes this into Mr. Burns and explains how the group that drank "Pitbull" out-stapled the non-Pitbull drinking group.

Match each science process skill with the statement below that demonstrates that skill.

- | | | | |
|---------------|----------------|---------------------------|------------------|
| a. observing | b. classifying | c. measuring | d. inferring |
| e. predicting | f. estimating | g. defining operationally | h. making models |

- _____ He has noticed employees that drink "Pitbull" seem to get more done.
- _____ Mr. Smithers expects to see employees do about 35% more work with "Pitbull".
- _____ Mr. Smithers thinks if employees drink "Pitbull" and increase production, the plant will be a better place to work.
- _____ Mr. Smithers makes an example of how the stapled papers should look so the employees can staple the papers correctly.
- _____ Mr. Smithers thinks if he can increase employee production, Mr. Burns might give him a raise.
- _____ Mr. Smithers separates the employees into 2 groups of 50 people each, he gives group A 150 mL of "Pitbull" every 30 minutes.
- _____ Employees must sort the stapled packets into 5 groups for each department of the plant.
- _____ Mr. Smithers explains to his employees that "getting more work done" means that more papers will get stapled in a specific amount of time (1 hour).

Scientific Method – Match each statement with the step of the scientific method

- | | | |
|----------------------------|----------------------|-------------------------|
| a) Ask a question | b) Form a Hypothesis | c) Design an experiment |
| d) Collect data | e) analyze data | f) form a conclusion |
| g) communicate the results | | |

- _____ He takes the graph to Mr. Burns and shows him how much work each group completed.
- _____ Mr. Smithers wants to know if drinking "Pitbull" will increase the amount of work employees do.
- _____ Mr. Smithers separates his employees into two groups and gives one group "Pitbull", one group no "Pitbull". He counts how many papers each group staples after 1 hour.
- _____ Mr. Smithers figures out that employees that drink "Pitbull" during the day can get more work done.
- _____ He makes a graph showing how many papers each group staples every 5 minutes.
- _____ He thinks that if all employees drink "Pitbull", they will get more done every day.
- _____ Mr. Smithers counts how many papers each group has stapled every 5 minutes. At the end of 1 hour he finds that group A stapled 1,587 stacks while group B stapled 2,113 stacks.

What is wrong with Mr. Smithers's conclusion?