

# Variables Worksheet

- **Find it:** Class Website, **Unit 6, #2a**
- **Open it:** In Notability
- **Title it:** **H#, Last, First, Variables**
- **Move it:** To Unit 6

Name \_\_\_\_\_ Hour \_\_\_\_\_

## Variables

Define the following words to help you with this activity:

1. Independent Variable (IV) =



# IDENTIFYING VARIABLES

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# Learning Target

Learning Target: I can understand and identify independent variables, dependent variables, constants, and controls.

# Plant Experiment



Imagine we do an experiment with plants.

- **We “feed” one plant Coke and another plant water.**
- **We want to see which one grows the most.**

\*\*\*We will use this example experiment throughout to help us understand variables.

# Types of Variables

## Independent Variable (IV):

**1.** The variable that is *changed* by the scientist.

- The variable “I” change.

\*\*\*This is basically what we are testing!



## Plant Experiment: IV

- What would the Independent Variable be in our plant experiment?

*Hint: What variable am I controlling?*

### **5. Plant experiment IV = ?**

Talk with your table partner and be prepared to share.

# Types of Variables

## Dependent Variable (DV):

**2.** The variable that *might* change as an outcome.

– The thing being measured (data).

\*\*The dependent variable DEPENDS on the independent variable.



## Plant Experiment: DV

- What would the **dependent variable** be in our plant experiment?

*Hint: What variable am I measuring?*

**6. Plant experiment DV = ?**

Talk with your table partner and be prepared to share.



## Did You Know!

Your **hypothesis** can TELL you what your variables are.

For example:

**If** I drink Mountain Dew before bed,  
**then** I will not sleep very much.

IV: *Drinking Mountain Dew*

DV: *Amount of sleep*

# Hypothesis Practice

*Use the following hypotheses to identify the variables:*

**If** I leave all the lights on all day,  
**then** my electric bill will be expensive.

**9.** IV = ?

**10.** DV = ?

# Hypothesis Practice

*Use the following hypotheses to identify the variables:*

**If** I brush my cat more,  
**then** there will be less fur on my furniture.

**11.** IV = ?

**12.** DV = ?

# Constants

**3. Constants** are variables that are kept the same.

- *Constants make an experiment “fair.”*

- Constants help you be sure of WHY something else did or did not change.

## Imagine this...

- A weight-loss company makes a new pill that claims to help people lose 3 pounds each week. They do an experiment where they have a person, Jim, take the pills each day for a week.



- Jim also recently joined a basketball league and has 2 games that week.



- Jim was also sick 2 days that week so didn't eat for 1 whole day.



- At the end of the week, Jim has lost 3 pounds.
- The company claims their pill is a success!!

What is wrong with this?



# Too many variables (changes)!

- We don't know WHAT caused Jim to lose weight.
- It could have been:
  - Basketball
  - Sickness
  - Pill

# Constants

- Constants are important because they help us isolate WHAT caused the change (or lack of change).
- *Remember, constants make an experiment “fair”.*



# Plant Experiment: Constants

- We give one plant Coke and the other water, but what things are the same for both plants?
- Create a list of things we would need to keep CONSTANT.

**7. Plant experiment constants = ?**

## Fall Practice

**Hypothesis:** If the temperature drops, then the leaves will turn colors.

**13. Independent Variable (IV) = ?**

**14. Dependent Variable (DV) = ?**

**15. Constants (2 or more) = ?**

# Control

**4.** The control is the test group that is **not changed**.

- It's the group that is kept “**normal**.”

**Example:** If we were testing what happens when we add more water to a cake recipe, the **control** would be the “normal” recipe (with normal water amount).



# Plant Experiment: Control

What would the Control (the “norm”) be?

*Hint: Which test group would be “normal”?*

**8. Plant experiment control group = ?**

## Variables: Memory Aid

Copy the following to help you remember:

- 16. IV: What “I” choose to change**
- 17. DV: What we measure or watch (data)**
- 18. Constants: Things we keep the same**
- 19. Control: The “normal” test group**

## Milk Experiment

Read the following experiment and fill in the blanks. **(20–23)**

- **Elizabeth wanted to test if temperature affected how fast milk goes bad and curdles (chunks!).**
- **She left 4 oz. of milk in a room temperature closet, a fridge, and a 150°F oven.**
- **She then measured how rotten the milk was after 10 days.**



## Milk Experiment: *ANSWERS*

What answers did you come up with?

**IV** = Temperature

**DV** = Milk (How Rotten)

**Constants (2)** = Milk Age, Milk Brand, Milk Type

(Skim, 1%, 2%), Quantity of Milk, Container (Lid?)

**Control** = The milk in the Fridge

# Variable Scenarios

**24.** Choose 4 of the “Variable Scenarios” and fill out the table.

## Instructions:

- Go to [Unit 6](#) on the class website
- Open **#2b. Variable Scenarios PPT**
- Read it in Safari, or put it into Notability
- Work with a partner to complete the table using 4 readings

| Experiment Name | Independent Variable (IV) | Dependent Variable (DV) | Constants (2) | Control |
|-----------------|---------------------------|-------------------------|---------------|---------|
|                 |                           |                         |               |         |

# Experiment Design

- Design your own experiment.
- Write it down – be detailed!
- Identify the four items below for your experiment.

**25. IV = ?**

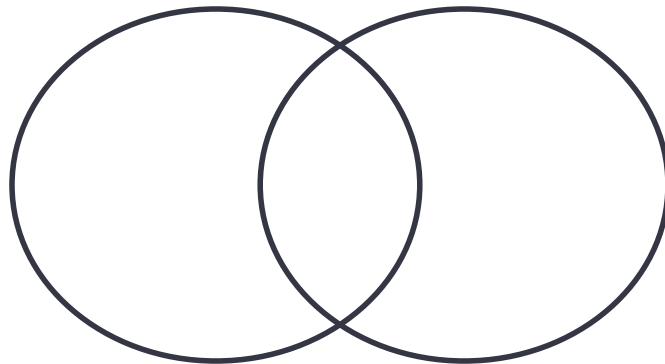
**26. DV = ?**

**27. Constants (2) = ?**

**28. Control = ?**

# Venn Diagram

- Turn our plant experiment into a Venn Diagram (#29)
  - Each **test group** should be a circle
  - All **constants** should be the same for both, so they go in the center.



# Variables Inquiry (Honors)

- **Find it:** Class Website, **Unit 6, #2c**
- **Open it:** In Notability
- **Title it:** **H#, Last, First, Variables Inquiry (Honors)**
- **Move it:** To Unit 6

Name \_\_\_\_\_ Hour \_\_\_\_\_

## Variables Inquiry (Honors)

### Scenario 1

You are conducting an experiment to determine if increased ultraviolet radiation from the sun is causing a decrease in the ozone layer is killing off frog tadpoles. After examining all of the data available in the library, you decide to go with a hypothesis that increased ultraviolet radiation from the sun is killing off the tadpoles. You design an experiment with two test groups. Group 1 involves 100 tadpoles in a five-gallon container of water that is covered by glass

# VARIABLE SCENARIOS

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## Krusty Krabs Breath Mints

Mr. Krabs created a secret ingredient for a breath mint that he thinks will "cure" the bad breath people get from eating crabby patties at the Krusty Krab. He asked 100 customers with a history of bad breath to try his new breath mint. He had fifty customers (Group A) eat a breath mint after they finished eating a crabby patty. The other fifty (Group B) also received a breath mint after they finished the sandwich, however, it was just a regular breath mint and did not have the secret ingredient. Both groups were told that they were getting the breath mint that would cure their bad breath. Two hours after eating the crabby patties, thirty customers in Group A and ten customers in Group B reported having better breath than they normally had after eating crabby patties.



## SpongeBob Clean Pants

SpongeBob noticed that his favorite pants were not as clean as they used to be. His friend Sandy told him that he should try using Clean-O detergent, a new laundry soap she found at Sail-Mart. SpongeBob made sure to wash one pair of pants in plain water and another pair in water with the Clean-O detergent. After washing both pairs of pants a total of three times, the pants washed in the Clean-O detergent did not appear to be any cleaner than the pants washed in plain water.





## Squidward's Symphony

Squidward loves playing his clarinet and believes it attracts more jellyfish than any other instrument he has played. In order to test his hypothesis, Squidward played a song on his clarinet for a total of 5 minutes and counted the number of jellyfish he saw in his front yard. He played the song a total of 3 times on his clarinet and repeated the experiment using a flute and a guitar. He also recorded the number of jellyfish he observed when he was not playing an instrument.



## Super Bubbles

Patrick and SpongeBob love to blow bubbles! Patrick found some Super Bubble Soap at Sail-Mart. The ads claim that Super Bubble Soap will produce bubbles that are twice as big as bubbles made with regular bubble soap. Patrick and SpongeBob made up two samples of bubble solution. One sample was made with 5 oz. of Super Bubble Soap and 5 oz. of water, while the other was made with the same amount of water and 5 oz. of regular bubble soap. Patrick and SpongeBob used their favorite bubble wands to blow 10 different bubbles and did their best to measure the diameter of each one.



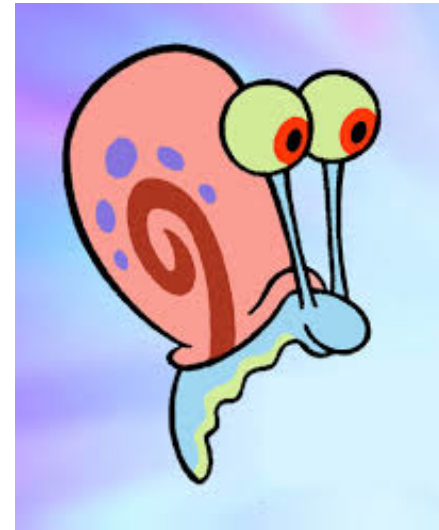
## Patty Power

Mr. Krabbs wants to make Bikini Bottoms a nicer place to live. He has created a new sauce that he thinks will reduce the production of body gas associated with eating crabby patties from the Krusty Krab. He recruits 100 customers with a history of gas problems. He has 50 of them (Group A) eat crabby patties with the new sauce. The other 50 (Group B) eat crabby patties with sauce that looks just like new sauce but is really just mixture of mayonnaise and food coloring. Both groups were told that they were getting the sauce that would reduce gas production. Two hours after eating the crabby patties, 30 customers in group A reported having fewer gas problems and 8 customers in group B reported having fewer gas problems.



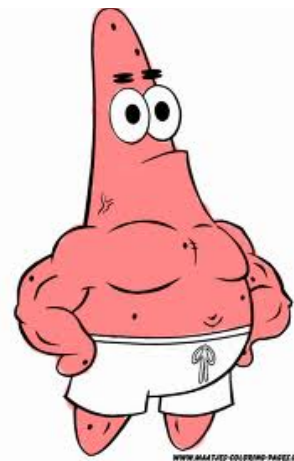
## Slimotosis

Sponge Bob notices that his pal Gary is suffering from slimotosis, which occurs when the shell develops a nasty slime and gives off a horrible odor. His friend Patrick tells him that rubbing seaweed on the shell is the perfect cure, while Sandy says that drinking Dr. Kelp will be a better cure. Sponge Bob decides to test this cure by rubbing Gary with seaweed for 1 week then having him drink Dr. Kelp to see which works best.



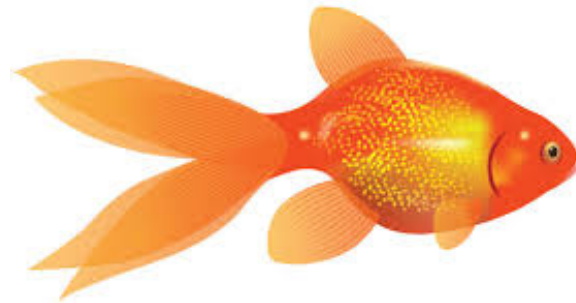
## Marshmallow Muscles

Larry was told that a certain muscle cream was the newest best thing on the market and claims to double a person's muscle power when used as part of a muscle-building workout. Interested in this product, he buys the special muscle cream and recruits Patrick and SpongeBob to help him with an experiment. Larry develops a special marshmallow weight-lifting program for Patrick and SpongeBob. He meets with them once every day for a period of 2 weeks and keeps track of their results. Before each session Patrick's arms and back are lathered in the muscle cream, while Sponge Bob's arms and back are lathered with the regular lotion.



## Microwave Miracle

Patrick believes that fish that eat food exposed to microwaves will become smarter and would be able to swim through a maze faster. He decides to perform an experiment by placing fish food in a microwave for 20 seconds. He has the fish swim through a maze and records the time it takes for each one to make it to the end. He feeds the special food to 10 fish and gives regular food to 10 others. After 1 week, he has the fish swim through the maze again and records the times for each.



## Super Worker Juice

Smithers thinks that a special juice will increase the productivity of workers. He creates two groups of 50 workers each and assigns each group the same task (in this case, they're supposed to staple a set of papers). Group A is given the special juice to drink while they work. Group B is not given the special 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.



## Slime Remover

Homer notices that his shower is covered in a strange green slime. His friend Barney tells him that coconut juice will get rid of the green slime. Homer decides to check this out by spraying half of the shower with coconut juice. He sprays the other half of the shower with water. After 3 days of "treatment" there is no change in the appearance of the green slime on either side of the shower.





## Microwave Mice

Bart believes that mice exposed to microwaves will become extra strong (maybe he's been reading too much Radioactive Man). He decides to perform this experiment by placing 10 mice in a microwave for 10 seconds. He compared these 10 mice to another 10 mice that had not been exposed. His test consisted of a heavy block of wood that blocked the mouse food. he found that 8 out of 10 of the microwaved mice were able to push the block away. 7 out of 10 of the non-microwaved mice were able to do the same.



## Itching Powder

Krusty was told that a certain itching powder was the newest best thing on the market, it even claims to cause 50% longer lasting itches. Interested in this product, he buys the itching powder and compares it to his usual product. One test subject (A) is sprinkled with the original itching powder, and another test subject (B) was sprinkled with the Experimental itching powder. Subject A reported having itches for 30 minutes. Subject B reported to have itches for 45 minutes.

