

# Key Question: Pg 23

Why is collecting and organizing information and data important?

Write this question down on top of page 23 and answer. Take 3 minutes to finish. When finished, spend 1 minute discussing and revising your answer with your table partner.

# 1.1 Quiz- pg 20/21

- Place your quiz taped on top only on page 21
- Title page 21 “1.1 Scientific Method Quiz” and date it.
- Write any questions or notes regarding the quiz on page 20. Things you want to remember, etc.
- Title page 20 “1.1 Quiz ?” and date it.

# Page 22/23

- Title page 22 “KWL” and date it.
- Place your KWL on page 22
- Title page 23 “1.2 Experimental Design Notes” and date it.
- You will begin taking notes on page 23 below your key question and expand your notes onto a separate piece of paper as a flipable, if needed.
- Work on your KWL for 3 minutes

# Experimental Design

Begin Note Taking On Page 23. Extend your notes onto a separate sheet of paper. Tape onto the bottom of page 23 and fold up.

# Learning Targets

I can...

- Identify the three types of variables in an experiment
- identify quantitative and qualitative data
- decide whether data is directly or inversely proportional.
- Determine if an experimental setup would be defined as having "good experimental design."

# Variable

- 3 types of variables



# 1. Independent Variable

- The factor that is changed is known as the **independent variable**.

## 2. Dependent Variable

- The factor that is measured or observed is called the **dependent variable**.



## 3. The Control Variable

- Everything that is kept constant, does not change in an experiment.

# The Control

- The experimenter makes a special effort to keep all variables **constant** except the **one she is changing**, so that they will not affect the measurements.
- Those factors are called **control variables**.

# What is the Purpose of a Control Variable?

- Controls are **NOT** being tested

# Example of Controls & Variables

- For example, suppose you want to figure out the fastest route to walk home from school.
- You will try several different routes and time how long it takes you to get home by each one.
- Since you are only interested in finding a route that is fastest for you, you will do the walking yourself.

# What are the Variables in Your Experiment?

- Varying the route is the **independent variable**
- The time it takes is the **dependent variable**
- Keeping the same walker throughout makes the walker a **control variable**.

One more thing... it is best to do **many trials**, changing the independent variable many times.

# Valid Experiments

- Choose only **one independent variable** to manipulate
- Choose only **one dependent variable** to measure
- All others are **control variables**
- Do **many trials**, changing the independent variable many times
- Make sure both variables are **quantitative** (numbers)

# Data

- Results of the experiment
- May be quantitative (numbers) or qualitative
- Physics is usually quantitative





# Data

- Must be **organized**
- Can be organized into **charts, tables, or graphs**

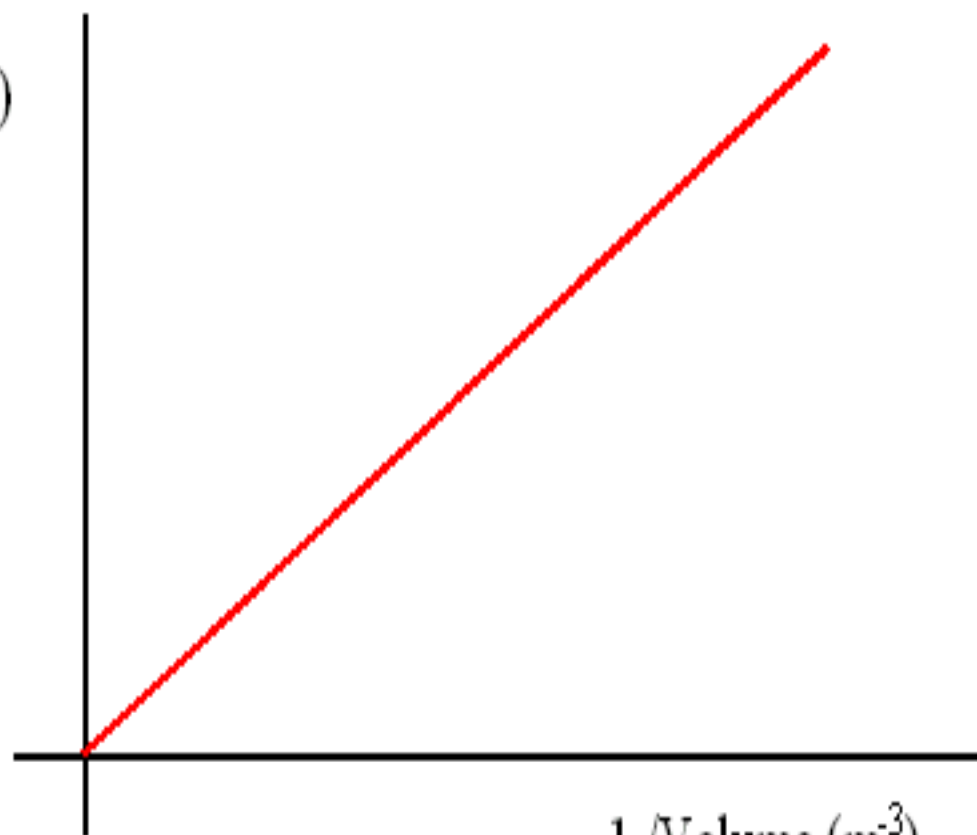
# Two Types of Data:

- Directly Proportional
- Inversely Proportional

# Data -

- **Directly proportional** data means **increasing** the independent variable causes the dependent variable to **increase**

Pressure (kPa)



$1/\text{Volume (m}^{-3}\text{)}$

# Data

- **Inversely proportional data means increasing the independent variable causes the dependent variable to decrease**



**INVERSELY PROPORTIONAL**

*Just as relationships are like that*

# Pg 24/25

- Title page 25 “1.2 Experimental Design Inquiry” and date it
- You will insert the 1.2 Design Inquiry on page 25. Tape only the top.
- Leave page 24 blank, but title page 24 “1.2 Experimental Design Choose 1” and date.

# Chose One - Pg 24

- Write a poem using 4 of your vocabulary words.
- Write a song using 4 of your vocabulary words.
- Create a memorization tool with 4 of your words.
- Make a poster using 4 of your words.