

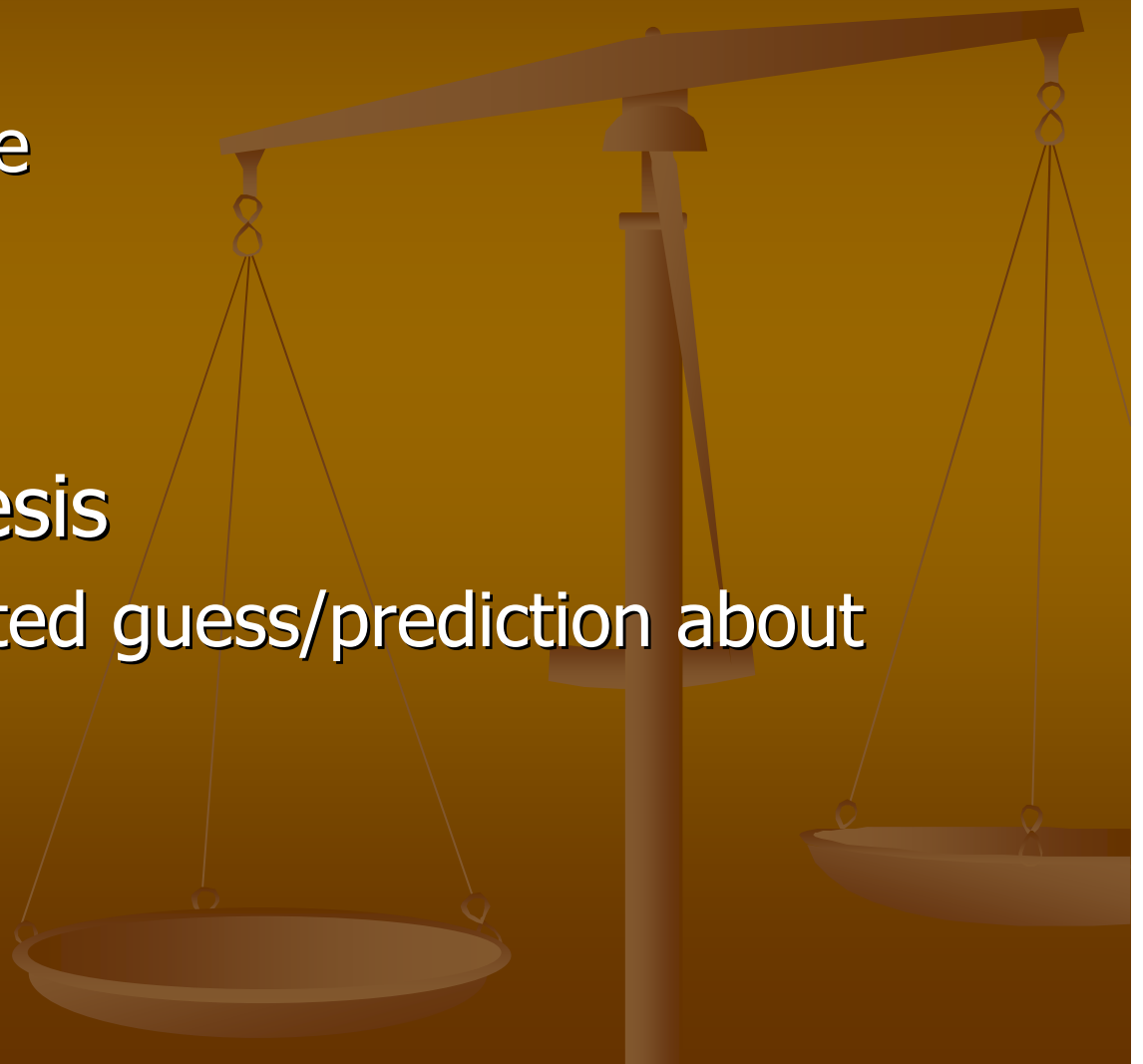
# The Scientific Method

A Process of Inquiry



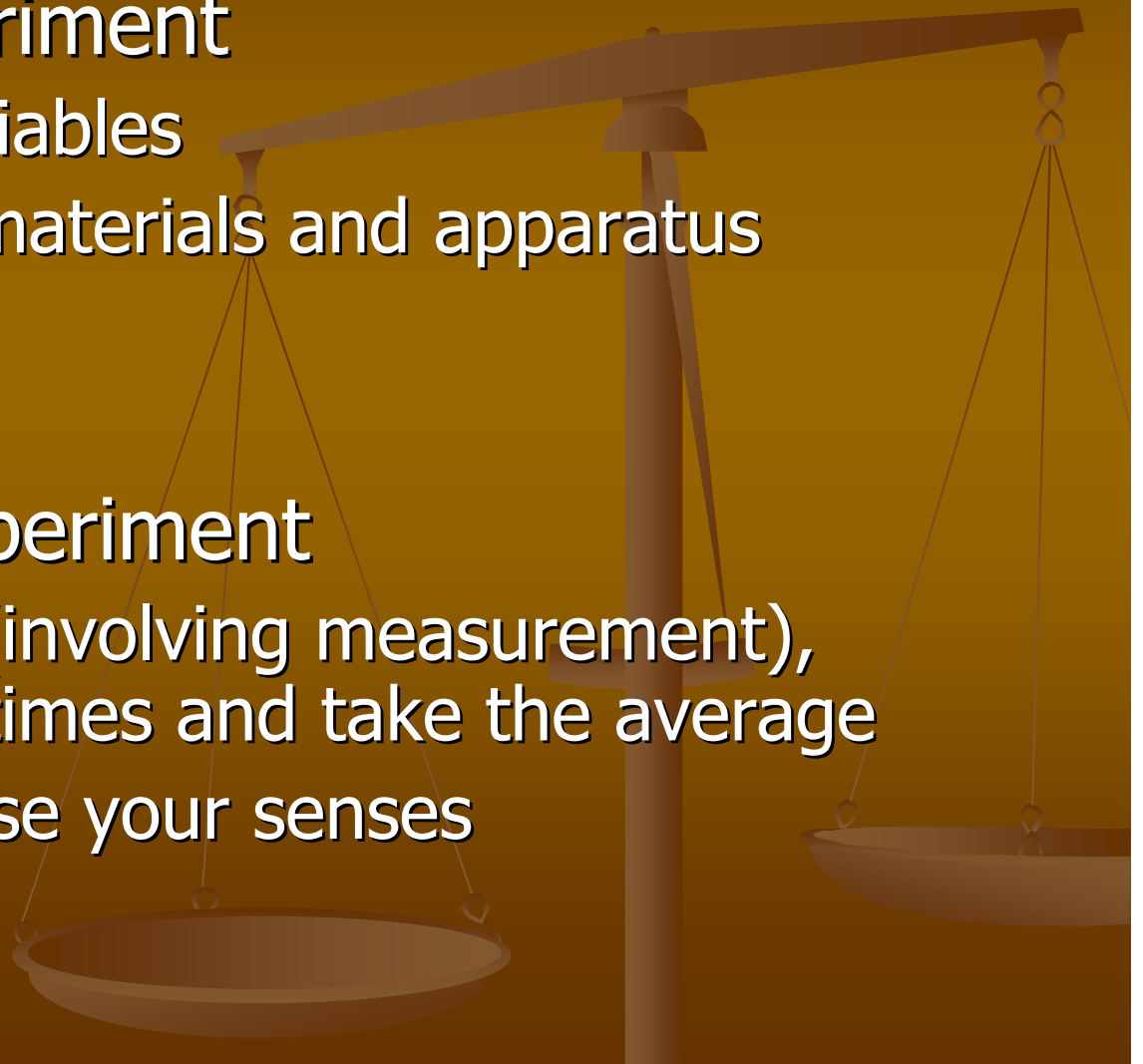
# The Scientific Method

- Ask a Question
  - Must be testable
  
- Make a Hypothesis
  - Make an educated guess/prediction about your question



# The Scientific Method

- Design an Experiment
  - Identify the variables
  - Decide on the materials and apparatus
  - Consider safety
- Conduct the Experiment
  - If quantitative (involving measurement), repeat several times and take the average
  - If qualitative, use your senses



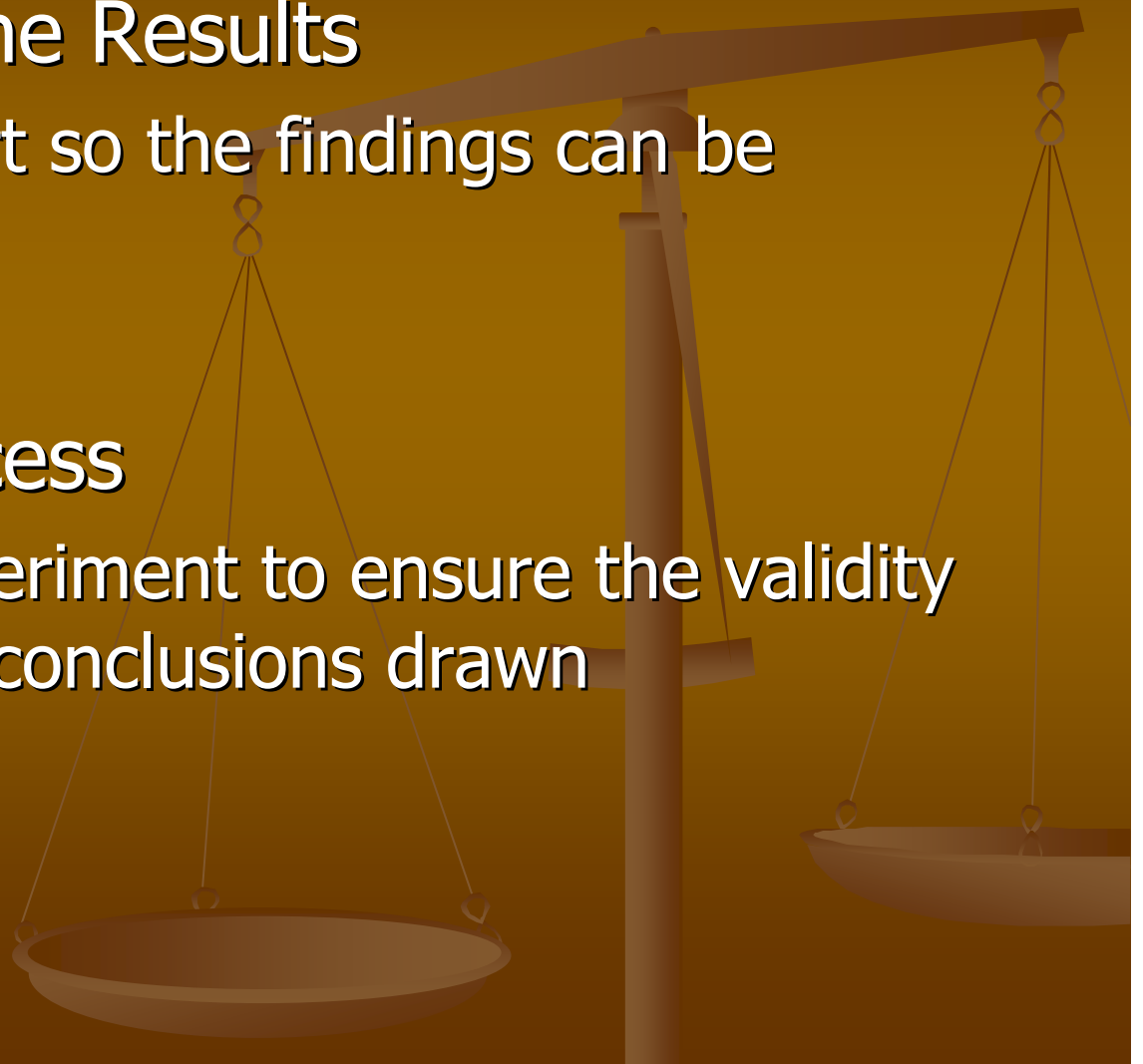
# The Scientific Method



- Observe and Record Data
  - Make careful notes during the experiment
  - Prepare tables/charts for recording data
- Organize and Analyze Results
  - Look for patterns and trends in the data
  - Make conclusions and explain

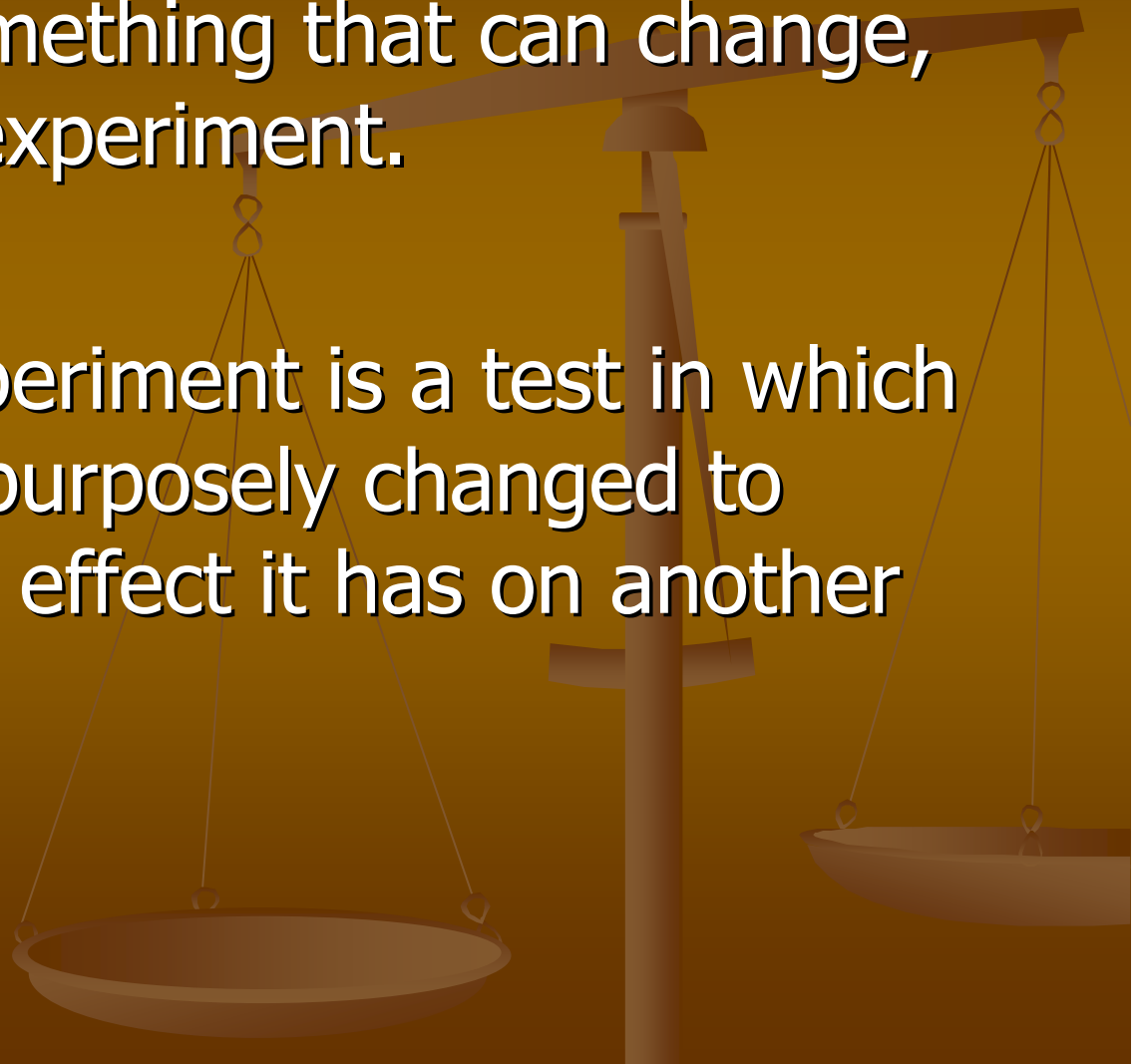
# The Scientific Method

- Communicate the Results
  - Prepare a report so the findings can be shared
- Repeat the Process
  - Repeat the experiment to ensure the validity of the findings/conclusions drawn



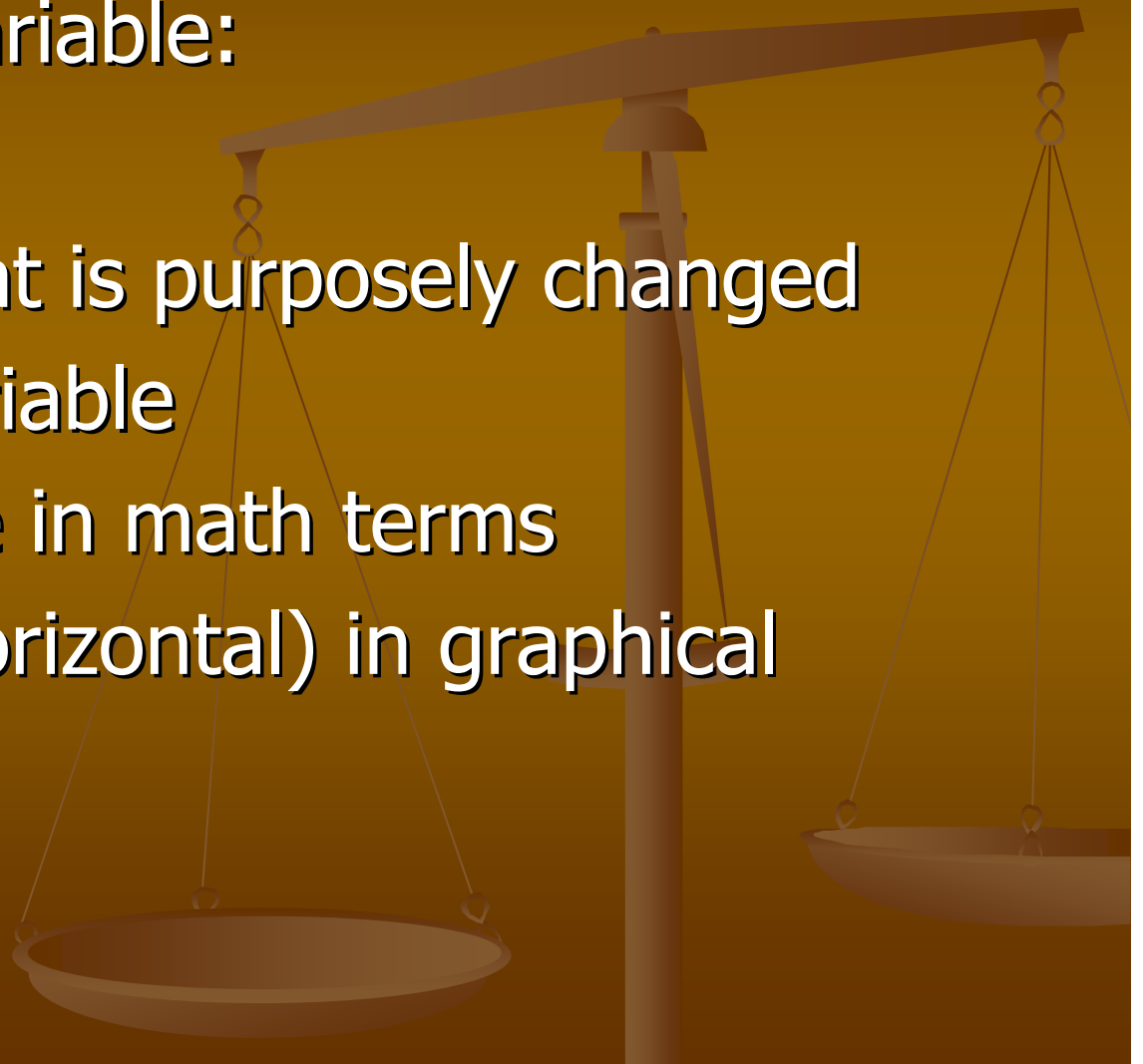
# Experimental Design

- A variable is something that can change, or vary, in the experiment.
- A controlled experiment is a test in which one variable is purposely changed to determine what effect it has on another variable.



# Experimental Design

- Independent Variable:
  - The variable that is purposely changed
  - The “cause” variable
  - The “x” variable in math terms
  - The “x-axis” (horizontal) in graphical terms



# Experimental Design

- Dependent Variable:
  - The variable being observed, or measured
  - It depends on the variable being purposely changed
  - The “effect” variable
  - The “y” variable in math terms
  - The “y-axis” (vertical) in graphical terms

