

## What is Science?

Limitations:

- What can it be used for? **Germs + disease.**  
- **Anything you can measure.**
- What can't it be used for?  
- **Feelings, opinions**

## How Scientists Work - The Scientific Method

Designing an Experiment

*The basic steps of designing an experiment are? We covered these on the vocab sheet.*

1. **Observation** - **See something you don't get.**
2. **Problem** - **Want to answer unknown question**
3. **Hypothesis** - **What you think (based on info)**
4. **Experiment** - **Anything that collects info about hyp.**
5. **Analysis** - **Review data + make sense of it.**
6. **Conclusion** - **Decide if your hypothesis looks right or wrong.**

- Now, how do you perform each of these steps so that you get answers you can trust.

1. Make useful observations

Qualitative - **Observe descriptions (Color, Texture) Using Words**

Quantitative - **Observations with number measures**

2. Ask a focused question-

**Has to be a question you can answer with Science.**

3. Compose an educated and testable hypothesis-

**- Has to be able to answer YES / NO.**

4. Design a controlled experiment-

- What makes it controlled?

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- \_\_\_\_\_  
What two groups are needed?

- \_\_\_\_\_

Control Group -

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- \_\_\_\_\_

Experimental Group -

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5. What are constants (or controlled variables) in a controlled experiment?

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6. What are the two variables that we care most about?

**1. Independent (Manipulated) variable**

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**2. Dependant (Responding) Variable**

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7. What is the point of trying an experiment more than once (repeatability)?

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8. There are different types of measurement?

- Direct vs. Indirect

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## 9. Random sample

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## 10. Bias & Blind Experiments

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## 11. Evidence vs. Inference

- Evidence:
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- Inference:
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## 12. Record the data you get from an experiment in the best format?

- A table- good for two linked measurements (Age vs. Height)
- A graph- things that change over time (seasonal temperature)
- A diagram- for qualitative data

## 13. Analyze the data to understand its meaning.

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## 14. Decide on a conclusion.

- What exactly is a conclusion?
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- What may be used to draw a conclusion?
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## 15. Experimental Error

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### Degrees of Certainty

#### 1. Hypothesis

Name \_\_\_\_\_

Per. \_\_\_\_\_

2. Theory

3. Law