

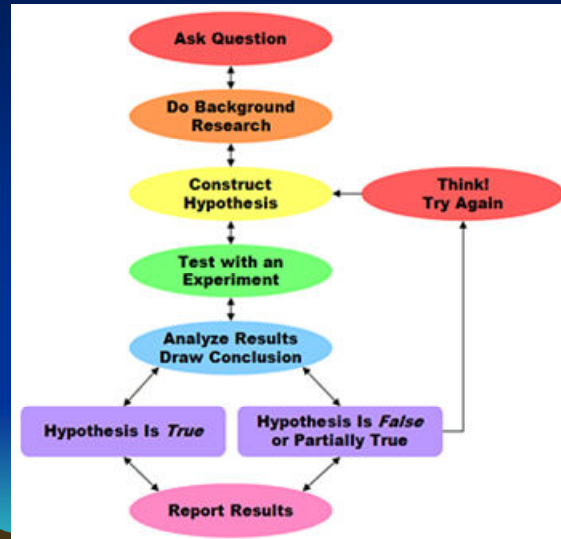
Observe, Infer & predict

- New terms:
 - **Observing**: using your 5 senses to gather information
 - **Inferring**: trying to explain or interpret the observations you made
 - **Predicting**: making a forecast of what will happen based on your observations



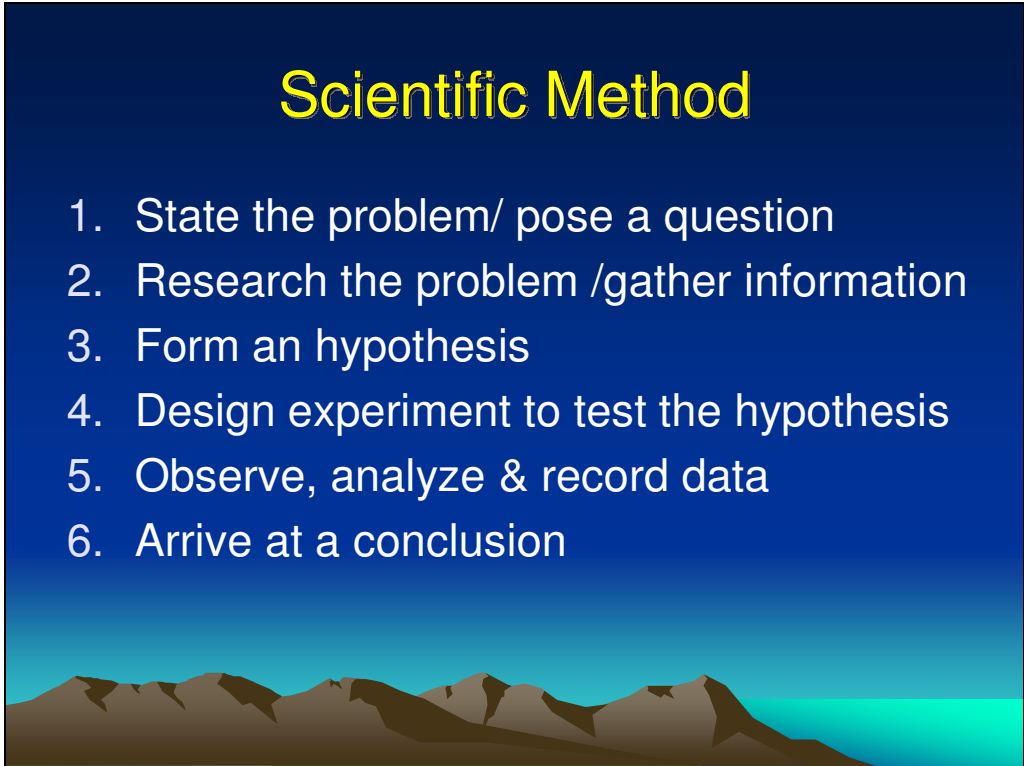
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graph TD; A([Ask Question]) <--> B([Do Background Research]); B <--> C([Construct Hypothesis]); C <--> D([Test with an Experiment]); D <--> E([Analyze Results Draw Conclusion]); E --> F[Hypothesis Is True]; E --> G[Hypothesis Is False or Partially True]; F --> H([Report Results]); G --> I([Think! Try Again]); I --> C;
```

The flowchart illustrates the scientific method as a cyclical process. It begins with 'Ask Question', followed by 'Do Background Research', 'Construct Hypothesis', 'Test with an Experiment', and 'Analyze Results Draw Conclusion'. From 'Analyze Results Draw Conclusion', the process branches into two paths: 'Hypothesis Is True' and 'Hypothesis Is False or Partially True'. Both paths lead to 'Report Results'. If the hypothesis is false or partially true, the process loops back to 'Construct Hypothesis' via the 'Think! Try Again' step.



Scientific Method

1. State the problem/ pose a question
2. Research the problem /gather information
3. Form an hypothesis
4. Design experiment to test the hypothesis
5. Observe, analyze & record data
6. Arrive at a conclusion



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1. State the problem/ pose a question

- Questions usually arise from observations made...
 - Why did “this” happen?
 - How does “this” work?

2. Research the problem /gather information

- Once you have a question in mind, research the possible answers so that you can make an “educated guess” as to the answer.

3. Form an hypothesis

- **Hypothesis** – your educated guess to answer the question
- Possible explanations for a set of observations made
- Hypotheses lead to predictions that can be tested



4. Design experiment

- Experiment must be repeatable
- Controlled experiments allow for only one factor to be tested at a time... the variable
 - **Manipulated variable**: the variable changed
 - **Responding variable**: the factor that changes when the manipulated variable changes

5. Observe, analyze & record data

- Collect data, make measurements, record information
- Analyze the data you've collected.
- Does the data support or reject your hypothesis?
 - If hypothesis is inaccurate, restate and develop a new hypothesis and continue.

6. Arrive at a conclusion

- Be able to repeat the experiment.
- Report the results of your conclusions
- **Theory**: is a well-tested explanation for a wide range of observations or experimental results.
- **Law**: describes an observed pattern in nature, but does not provide an explanation for it.

