How to take:

Cornell Notes
Divide your paper sections

Now:
• Heading
• Notes

Later:
• Study ?s
• Summary

### Notes Table

<table>
<thead>
<tr>
<th>Title of Notes</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study ?s Level 1,2 &amp; 3</td>
<td></td>
</tr>
<tr>
<td>Take Notes during presentation</td>
<td></td>
</tr>
<tr>
<td>Underline key words</td>
<td></td>
</tr>
<tr>
<td>Skip a line after each slide</td>
<td></td>
</tr>
<tr>
<td>Abbreviate</td>
<td></td>
</tr>
</tbody>
</table>

**Summary**

3-5 sentences
Study your notes

- Review your notes.
- Quiz your self with the study questions.
- Review your summaries.
The Scientific Method

THINK like a Scientist.
RECORD like a Scientist.
REFLECT like a Scientist.
The Scientific Method

- “Science” derived from Latin ‘to know’
- Way of **asking** and **answering** questions about natural phenomena

- **Pseudoscience** = FALSE Science
- Science does NOT investigate the “supernatural” or study morality, religion, etc.
**Laws, Theories & Models**

**Law:** A rule that describes patterns observed in nature. Ex. *Law of Gravity, Laws of Motion*

**Theory:** A logical explanation of WHY or HOW things work in nature based on observations and experimentation. Ex. *Atomic Theory, Big Bang Theory*

**Model:** a diagram or 3D representation of an object or process.

- *Theories and laws are well-accepted by scientists, but... THEY ARE NOT SET IN STONE!*
- *They are revised when new information is discovered.*
1. Problem/Question

- A **problem** is a question based upon observations that can be tested through experimentation.

**Ex.** What is the effect of **sunlight** on **plant growth**?
2. Observation/Research

- **Observe** the world using your senses (sight, sound, taste, touch, smell) and **research** your problem using the internet or books or journals.
3. Hypothesis/Prediction

- **Predict** a solution to the problem based on your research.

- “If...then...because...”

Ex. **If** sunlight **has an effect on plant growth**, **then** plants will **grow larger in the sun because** it is needed for photosynthesis.
4. Experiment

- **Test the hypothesis** with a step by step procedure.
- **It is clear and detailed** so another scientist can replicate your experiment.
- **List all materials.**
2 types of Variables

**Independent Variable (IV)**
- What the investigator (YOU) changes
- Known as the “Experimental Group”

Ex. **AMOUNT OF LIGHT** is changed for each plant.

**Dependent Variable (DV)**
- Changes due to the IV
- What you measure

Ex. measure the **PLANT GROWTH** (cm)
Control Group & Constants

- **Control group**
The group or sample that is used as a standard for comparison.
Ex. The *plant in the dark* is COMPARED to the experimental group (light).

- **Constants**
The factors in the experiment that need to stay the same between the experimental group and the control.
Ex. *amount of soil, nutrients, water*, etc. is CONSTANT for all plants.
5. Collect Data

- Information and observations collected during the experiment.

**QUALITATIVE**
- Descriptions of observations
  - “What it LOOKS like”
  Ex. Plant C has dried up and lost all of its leaves

**QUANTITATIVE**
- Numerical measurements
  - “NUMBERS with units”
  Ex. 15 cm
Write down examples from the video showing how the Myth Busters followed the steps of the Scientific Method.

1. Problem
2. Observation/Research
3. Hypothesis
4. Experiment
5. Collect Data
6. Analyze Results
7. Conclusion
8. Report Findings
6. Analyze results

- Display data using a graph to show patterns.
  Ex. Line graph, bar graph, pie chart, etc.
Precision vs. Accuracy

**Precision**
- How close the measurements are to each other.

**Accuracy**
- How close a measurement is to the actual (true) value.

- Measure carefully (precisely)
- Collect data in multiple trials (repeated tests) to increase accuracy.
7. Conclusion

- The **solution** to the problem.
- State whether your hypothesis is **accepted** or **rejected**.
- **Summarize and explain** the significance of your results.
- Sources of **error**, etc.
8. Report Findings

- Present your information to others so they can replicate your findings.
- Retesting by other scientists verifies your results.
Think you can name all 8 steps?

1. **Problem**
2. **Observation**
3. **Hypothesis**
4. **Experiment**
5. **Collect Data**
6. **Analyze Results**
7. **Conclusion**
8. **Report findings**
Any Questions?