

Name _____

The Scientific Method: A process used to find answers to questions

Step 1: Identify the Problem

- What do you want to know?
- Problems are always written in the form of a *question*.

Step 2: Research the Problem

- Learn what has been done before.
- Resources include books, scientific journals, periodicals, magazines, interview, internet and encyclopedias.
- Never *plagiarize*; always give credit when using another's work.

Step 3: Form a Hypothesis

- The educated guess.
- It's what you think will happen in your experiments.
- A hypothesis is always based on your research and experience.
- Sometimes your experiments will prove your hypothesis to be incorrect.

Step 4: Procedure / Experiment

- This is where you design your experiment.
- The experiment is the testing of your hypothesis.
- This step must be *numbered* and put in list form.

Materials List

- Make a *numbered list* of everything you use to conduct your experiments.

The Experiment

1. Observations – record what happens in the experiment (what you see). Keep a *log book or journal* of everything you do and see, including errors.
2. Inferring – What can you *imply* (or infer) from what you observe.

3. Independent Variable – *the part of the experiment that you change to see how it affects the dependent variable. The independent variable is always graphed on the x -axis of a graph.*
4. Dependent Variable – *the part of the experiment that changes in response to the changes you make to the independent variable. The dependent variable is always graphed on the y -axis of a graph.*
5. Control – *Use it for comparing.*
6. Sample size – *good experiments have large sample sizes to increase the accuracy of results.*
7. Repetition – *repeating experiments several times insure against experimental error and increase the size of results.*

Step 5: Results / Data

- This is the information that you gather from your experiment.
- *Quantitative data* is recorded on charts, tables and graphs and is the most necessary.
- *Qualitative data* includes illustrations and photographs. Sources must be included with photographs.

Step 6: Conclusion

- This is a *summary* of your results.
- State *whether or not* your hypothesis was correct.
- What *practical application* does your project have, and / or describe a possible *extension*.
- Identify any and all possible *errors*.
- What could you do *differently* to improve your project?