Scientific Method Definitions

- Analysis The breakdown of something that is complex into smaller parts in such a way that leads to a better understanding of the whole.
- Classify Grouping things together based on specific characteristics.
- **Compare** To examine the different and/or similar characteristics of things or events.
- **Control** The group or subject that is used as a standard for comparison in an experiment.
- **Critical thinking** Thinking that uses specific sets of skills to carefully analyze problems step-bystep; scientific methods are one type of critical thinking.
- **Data** Information, measurements and materials gathered from observations that are used to help answer questions.
- Experimental error Incorrect data in an experiment that may result from a variety of causes.
- **Experiment** A test using observations and controlled variables to discover answers to questions, and/or to check a hypothesis.
- **Hypothesis** A testable explanation for observations and questions about the physical universe. (Note: "hypothesis" is very similar to "prediction," and the two words are often used interchangeably.)
- Inference A logical explanation or conclusion based on observations and/or facts.
- **Measure** To compare the characteristics of something (such as mass, length, volume) with a standard (such as grams, meters, liters).
- Methods An ordered series of steps followed to help answer a question.
- Nature The entire physical universe.
- **Observation** -(1) Noticing objects or events using the five senses. (2) The data collected by using the five senses to learn about objects and events.
- **Prediction** A statement made about the future outcome of an experiment based on past experiences or observations.
- **Procedure** An ordered series of steps followed to help answer a question.
- **Qualitative data** Data that is based on observable characteristics of things or events that can be collected using the five senses. *Example:* "The juice tastes sweet to me."
- Quantitative data Data that is based on measurable characteristics of things or events such as mass, volume, length, and quantity. *Example:* "There is one liter of juice in the carton."

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Repeated trials – Experimental tests done more than once.

Replication – Repeated trials on more than one subject, as well as controls, in experimental tests.

- Science The study of nature and the physical world using the methods of science, or a "special method of finding things out."
- Scientist A person who "does" science and uses the methods of science.
- Scientific law A generalized pattern in nature.
- Scientific method(s) A process of critical thinking that uses observations and experiments to investigate testable predictions about the physical universe.
- Scientific theory A causal explanation for generalized patterns in nature that is supported by much scientific evidence based on data collected using scientific methods.
- **Variation** Slight differences among objects, organisms or events that are all of the same basic type.
- **Variable** Something that can affect a system being examined, and is therefore a factor that may change in an experiment.
- **Variable**, **independent** A factor that can be changed or manipulated in an experiment by the scientist; "you change it" variables.
- **Variable**, **dependent** A factor that responds to changes in other variables in an experiment; "it changed" variables.