Scientific Method Steps and Definitions

Each step, what it means and an example from one experiment: does sugar dissolve faster in hot water?

#	Step	What it means	Example
1	**Ask a question**	Notice something and turn it into a question you can answer by measuring.	*Does sugar dissolve faster in hot water than in cold water?*
2	**Do background research**	Find out what is already known so you can make a better prediction and avoid known mistakes.	*Read that warmer water molecules move faster and hit the sugar crystals more often.*
3	**Construct a hypothesis**	Write a testable prediction, often as "If ... then ... because ...".	*If the water is hotter, then the sugar will dissolve faster, because faster molecules break the crystals apart sooner.*
4	**Test with an experiment**	Change one variable, measure another and keep everything else the same. Repeat at least three times.	*Time one teaspoon of sugar in cold, room-temperature and hot water, same cup, same amount, three trials each.*
5	**Analyze the data**	Organize the results in a table or graph and look for a pattern.	*Average the three times for each temperature and plot them on a bar graph.*
6	**Draw a conclusion**	Decide whether the data support or reject the hypothesis, and say why.	*Hot water dissolved the sugar fastest in every trial, so the data support the hypothesis.*
7	**Communicate results**	Share what you did and found so others can check it or repeat it.	*Present a poster or lab report with the question, method, data table, graph and conclusion.*

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Scientific Method Key Terms

Vocabulary used in every experiment and lab report

Term	Definition
Observation	Information gathered with the senses or instruments, such as noticing, measuring or counting.
Hypothesis	A testable prediction that answers the question and could be proven wrong by an experiment.
Prediction	The specific result you expect to see if the hypothesis is true.
Independent variable	The one factor you change on purpose (water temperature).
Dependent variable	The factor you measure to see if it responds (time for the sugar to dissolve).
Controlled variables	Everything you keep the same so it cannot affect the result (amount of sugar, cup, stirring).
Control group	The group that gets no change, used as the baseline for comparison.
Experimental group	The group that receives the change being tested.
Trial	One run of the experiment. Repeating trials shows whether a result is consistent.
Data	The recorded results: numbers (quantitative) or descriptions (qualitative).
Conclusion	A statement of whether the data support the hypothesis, based only on the results.
Peer review	Other scientists checking a study before it is published.
Scientific theory	A well-tested explanation that ties together many facts, laws and supported hypotheses.
Scientific law	A description of what always happens under stated conditions, often as an equation.

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