

Engineering and Design Vocabulary

Are you looking to incorporate more literacy into your science classroom?

Below is a list of words frequently used by engineers and designers. Encourage students to use these words when communicating with their project team, writing up reports, and presenting their findings.

Accuracy	Analysis	Argument	Assessment
Causation	Claim	Communicate	Constraints
Control	Correlation	Criteria	Design (v.)
Error	Diagram (n.)	Effectiveness	Efficiency
Function	Evaluate	Evidence	Failure
Inference	Hypothesis	Impact (n.)	Implication
Model	Observation	Investigate	Limit
Performance	Plan (n.)	Parallax	Patterns
Problem	Process	Precision	Predict
Quantitative	Reasoning	Prototype	Qualitative
Relevance	Reliability	Refine	Reflect
Requirements	Scale	Repeatability	Reproducibility
Test (v.)	Theory	Simulation	Specifications (Specs)
Uncertainty	Variability	Trade-Off	Trueness

Accuracy

The quality of being near to the true or desired value

Analysis

Breaking an object or process into smaller parts to examine or evaluate systematically

Argument

A persuasive defense for an explanation or solution based on evidence and reasoning

Assessment

An evaluation of the cost, quality and/or ability of someone or something

Causation

The relationship between cause and effect

Claim

A response made to a question and in the process of answering that question

Communicate

To share information orally, in written form and/or graphically through various forms of media

Constraints

A limitation or condition that must be satisfied by a design, including materials, cost, size, labor, etc.

Control

A variable that is kept the same across all tests for use as the comparison standard

Correlation

A predictive dependent relationship between variables that may be positive or negative. Changing a variable creates a corresponding change in another but does not imply causation.

Criteria

Attributes of a design that can be measured; a set of standards upon which a decision is based

Design (v.)

To generate or to propose a possible solution; to create, fashion, execute, or construct

Diagram (n.)

A visual representation of data or information

Effectiveness

A determination of how well a solution meets the criteria

Efficiency

The measurable relationship between a solution and the amount of resources it requires

Error

The difference between a measured value and its true or accepted value; important types include:

- **Random Error**

An unpredictable result from a consistent measurement process

- **Systematic Error**

A predictable and consistent deviation from a value (true or accepted) or a process

Evaluate

To determine significance

Evidence

Data used to support a claim

Failure

The inability of a device, process, or system to perform a required function

Function

A specific task that a system or part of a system performs or is intended to perform

Hypothesis

A possible explanation that can be tested with an experiment

Impact (n.)

A strong effect or influence on someone or something

Implication

A suggestion about or connection to a future outcome that is not stated directly

Inference

Forming an opinion based on known facts or evidence

Investigate

The process of gathering or examining information systematically; generating data to provide evidence to support a claim based on a stated goal, predicted outcome, and planned course of action

Limit

The minimum or maximum permissible value

Model

A diagram, replica, mathematical representation, analogy, or computer simulation used to analyze a system for condition flaws, test a solution, visualize or refine a design, and/or communicate design features

Observation

To become aware of an occurrence using the senses

Parallax

A perceived line of sight displacement while viewing an object

Patterns

Significant predictive features identified through analysis

Performance

The required action of a device, process or system

Plan (n.)

A systematic approach to solving a problem

Precision

The quality of being reproducible in amount or performance

Predict

To determine a future outcome

Problem

A situation to be changed; a question raised for inquiry, consideration, or solution

Process

A series of steps that form a pathway to a solution

Prototype

A model that tests design performance

Qualitative

Non-measurable and described through observation; subjective

Quantitative

Measurable and can be represented in numeric form; objective

Reasoning

A logical, objective thought process based on data, information, and evidence to form a conclusion or judgement

Refine

To improve through small changes

Reflect

Analyze a past course of action, process, or experience in order to generate a future improvement or modification

Relevance

The capability of someone or something to help solve a problem

Reliability

The ability of a device, process or system to perform an intended function without failure for a given time under specified operating conditions

Repeatability

Consistently repeating the same measurement procedure on a system or part of a system with the same tool used under the same conditions by the same person

Reproducibility

The consistent ability of a tool to reproduce the same measurement on a system under the same conditions no matter who operates the tool

Requirements

What the design must do; may be used in place of criteria

Scale

The relationship between the size of an accurate representation of an object and the actual object itself

Simulation

The use of a model to learn how a device, process or system will behave

Specifications (Specs)

A detailed written record specific to the criteria needed to solve the problem; the technical information about “what” is needed to solve the problem but not “how” to solve it

Test (v.)

To determine whether or not a design, model, process, system or theory meets the criteria as a possible solution

Theory

An idea or set of ideas used to explain a fact or event

Trade-Off

An exchange of one idea for another that may involve losing a quality or aspect of a design

Trueness

The closeness between the average value of a large series of measurements results and the true or reference value; quantitative

Uncertainty

Quantifiable doubt about a measurement result

Variability

The extent to which data points differ from each other; how far apart or how close together