



GLOSSARY

Aerospace engineering is the branch of engineering behind the design, construction and science of aircraft and spacecraft. It is broken into two major and overlapping branches: aeronautical engineering and astronautical engineering. The former deals with craft that stay within Earth's atmosphere, and the latter deals with craft that operate outside of Earth's atmosphere and is informally called rocket science

Bio Medicine is a branch of medical science concerned especially with the capacity of human beings to survive and function in abnormally stressful environments such as in space travel and with the protective modification of such environments.

Concurrent Engineering is a systematic approach to integrated, concurrent design of products and their related processes, including manufacturing and support. This approach is intended to cause the developers, from the outset, to consider all elements of the product life-cycle from conception through disposal, including quality, cost, schedule, and user requirements.

Datasheets can be created to detail specific information about a particular investigation such as weather, landform features etc. The data collected can then be used for scientific interpretation purposes. It can also be defined as a document summarising the performance and other characteristics of a component (e.g. an electronic component) a sub-system (e.g. a power supply) or software in sufficient detail to be used by a design engineer to design the component into a system.

Engineering is the discipline, art, and profession of acquiring and applying scientific, mathematical, economic, social, and practical knowledge to design and build structures, machines, devices, systems, materials and processes that safely realize solutions to the needs of society.

House of Quality is a diagram, resembling a house, used for defining the relationship between customer desires and the firm/product capabilities

Industrial design is a combination of applied art and applied science, whereby the aesthetics, ergonomics and usability of products may be improved for marketability and production. The role of an industrial designer is to create and execute design solutions towards problems of form, usability, physical ergonomics, marketing, brand development and sales.

Project manager can have the responsibility of the planning, execution, and closing of any project, typically relating to construction industry, architecture, computer networking, telecommunications or software development. Key project management responsibilities include creating clear and attainable project objectives, building the project requirements, and managing the scope, which are cost, time, and quality

Prototype is an original type, form, or instance of something serving as a typical example, basis, or standard for other things of the same category. There is no general agreement on what constitutes a “prototype” and the word is often used interchangeably with the word “model”



Proof-of-Principle Prototype (Model) This type of prototype is used to test some aspect of the intended design without attempting to exactly simulate the visual appearance, choice of materials or intended manufacturing process. Such prototypes can be used to "prove" out a potential design approach such as range of motion, mechanics, sensors, architecture, etc. These types of models are often used to identify which design options will not work, or where further development and testing is necessary.

Functional Prototype (Model) - also called a working prototype - will, to the greatest extent practical, attempt to simulate the final design, aesthetics, materials and functionality of the intended design. The functional prototype may be reduced in size (scaled down) in order to reduce costs. The construction of a fully working full-scale prototype and the ultimate test of concept, is the engineers' final check for design flaws and allows last-minute improvements to be made before larger production runs are ordered.

Remote Sensing is any technique for measuring, observing or monitoring a process or object without physically touching the object under observation. Optical and radio telescopes, cameras, even eyesight, are types of remote sensing with which you are probably familiar.

Scientist is a person having expert knowledge of one or more sciences, especially a natural or physical science. Scientists use systematic methods to study the world around them. They use an organized approach to observe and study the world. They ask questions, look for patterns, and try to find general rules for the natural world.

Soil Stimulant is where a material found on earth that can be used as a substitute to simulate the affects of environmental conditions such as dust storms on moon or mars. In Space exploration, they are used to test equipment and techniques for future space exploration.





Resources

ENERGY

Alternative energy

Teacher and student factsheets

http://technology.grc.nasa.gov/documents/GreenEnergyGRC_072809.pdf

Biofuel

http://www.nasa.gov/mission_pages/station/research/jatropha.html

Antimatter and nuclear power

http://www.nasa.gov/exploration/home/antimatter_spaceship.html

All About Circuits

http://www.allaboutcircuits.com/vol_6/chpt_3/7.html

The Planetary Fact Sheet

<http://nssdc.gsfc.nasa.gov/planetary/planetfact.html>

Solar Energy for Space Exploration: Student Guide

ISS Solar Array/Maths Connections

http://www.nasa.gov/pdf/161330main_SESE_Student_Resources_dc3.pdf

ENERGY (cont ' d)

Planet pictures and Facts, Johnson Space laboratory, NASA
<http://jpl.nasa.gov/education/images/pdf>

Mars Teachers Guide

<http://quest.nasa.gov/mars/teachers/tg/acrobat/index.html>

NASA Science

<http://science.nasa.gov/>

MULTIMEDIA

Virtual Field Trip: supporting geological Exploration
Analog site to Mars, WA NASA Ames Research Center – all grades
<http://quest.nasa.gov/vft/#wtd>

What's the Difference? Multimedia Software
comparing earth to mars environments, NASA Ames Research Centre all
<http://quest.nasa.gov/vft/#wtd>

ISS Station 3D SpaceWalk game, interactive multimedia resource
[http://www.nasa.gov/multimedia/3d_resources/station_spacewalk_](http://www.nasa.gov/multimedia/3d_resources/station_spacewalk_game.html)
[game.html](http://www.nasa.gov/multimedia/3d_resources/station_spacewalk_game.html)

Video of Building Curiosity - Rover Rocks Rocker-Boogie
[http://www.nasa.gov/multimedia/ideogallery/index.html?media_](http://www.nasa.gov/multimedia/ideogallery/index.html?media_id=18416173)
[id=18416173](http://www.nasa.gov/multimedia/ideogallery/index.html?media_id=18416173)



MULTIMEDIA (cont ' d)

Prototype Mars Rover

Interactive virtual view of rover

<http://www.nasa.gov/externalflash/msl20090507/index.html>

ISS video of activities conducted in January 2011

http://www.nasa.gov/multimedia/videogallery/index.html?media_id=52204101

Virtual tour of ISS

Features living and working on ISS

<http://www.nasa.gov/externalflash/ISSRG/>

<http://www.nasa.gov/externalflash/photosynth/index.html>

Amorphous Explorers

http://www.nasa.gov/multimedia/videogallery/index.html?media_id=54341821

NASA DATA

Mentoring & Inquiry using NASA Data on Atmospheric and Earth
Science for Teachers & Amateurs Grade K-12

http://mynasadata.larc.nasa.gov/User_lessons_all.php

Teachers guide looking at earth from space years 5-12
(comprehensive)

NASA DATA (cont ' d)

Teachers Guide with Activities for Earth and Space Science:

http://kids.earth.nasa.gov/guide/earth_and_space.pdf

Teachers guide looking at Earth from Space years 7-12

Glossary of Terms:

http://kids.earth.nasa.gov/guide/earth_glossary.pdf

NASA Quest - Mars Climate & Planet Profiles Grade 5-9

<http://quest.nasa.gov/aero/planetary/mars.html>

www.mars quest online

Virtual SKIES

Aviation technology & weather Education Guide

<http://virtualskies.arc.nasa.gov/index.html>

Changing Seasons of Earth from Space

Online remote sensing imagery:

http://www.nasa.gov/externalflash/EducationSlideshow_122010/index.html

JMARS Java Mission

<http://jmars.asu.edu/>

Exploration Rover Mission

http://www.nasa.gov/mission_pages/mer/mer-20070824.html



NASA DATA (cont ' d)

The Mars Student Imaging Project

<http://msip.asu.edu/> allows students to discoverMars

Marsbound

<http://marsbound.asu.edu/>

Virtual Field Trip: supporting geological Exploration throughout the world Analog site to Mars, Western Australia, NASA Ames Research Center – all grades

<http://quest.nasa.gov/vft/#wtd>

Spaceward Bound

Planning and Executing Planetary Analog Field Research Expeditions

<http://quest.nasa.gov/projects/spacewardbound/field.html>

POWER POINT PRESENTATIONS

1km Square array (telecommunications) CSIRO

<http://www.atug.com.au/presentations/>

[CaroleJacksonPresATUGInternationalConnectivityForum28Sept06.pdf](#)

ROBOTS/ROVERS

Technical Mars Rover Manual

MARSupial: an entry into the Mars Society's Mars Analog Rover Initiative Design Competition , Mars Society Australia Grade 7-12

<http://www.marsupial.org.au/>

Mars Science Laboratory

http://www.nasa.gov/pdf/482645main_MSL%20Fact%20Sheet.pdf

Video of Building Curiosity - Rover Rocks Rocker-Boogie

http://www.nasa.gov/multimedia/ideogallery/index.html?media_id=18416173

ASU Mars Education Program

<http://marsed.asu.edu/front>

Robonaut

<http://robonaut.jsc.nasa.gov/default.asp>

Robotics Alliance Project, NASA

<http://robotics.nasa.gov/edu/educators.php>

Prototype Mars Rover

Interactive virtual view of rover

<http://www.nasa.gov/externalflash/msl20090507/index.html>



RADIATION

Space faring: The Radiation Challenge

Educator's Guide: an interdisciplinary guide on radiation & space flight
Grade 6-8

http://www.nasa.gov/pdf/284277main_Radiation_MS.pdf

REMOTE SENSING

Technical Mars Rover Manual

MARSupial: an entry into the Mars Society's Mars Analog Rover

Initiative Design Competition , Mars Society Australia Grade 7-12

<http://www.marsupial.org.au/>

Robots

ASU Mars Education Program

<http://marsed.asu.edu/front>

Robotics Alliance Project, NASA

<http://robotics.nasa.gov/edu/educators.php>

Soil Stimulants -Scientific Paper - Mars Laboratory Experiment

http://empl.ksc.nasa.gov/Publications/MarsPaperJOE_Frank%20Gross.pdf

http://scifiles.larc.nasa.gov/educators/activities/2001_2002/athome/mars_soil.html

REMOTE SENSING (cont ' d)

History and background on Remote Sensing

<http://earthobservatory.nasa.gov/Features/RemoteSensing/remote.php>

Investigating Planetary Soils

http://solarsystem.nasa.gov/docs/Tricky_Terrain.pdf

Square Kilometer Array Telescope

Western Australia

<http://www.spacetime.com.au/ska.html>

ROCKETS

Educators Guide to Rockets

http://kids.earth.nasa.gov/guide/earth_and_space.pdf

Water Rocket Wiki

<http://www.vssec.vic.edu.au/vssec-interactive/wikis/>

Water Rockets – Educator's Manual

Japan Aerospace Exploration Agency

[http://wiki.vssec.vic.edu.au/waterrockets/images/0/07/
Educator%27s_Manual_%28English%29.pdf](http://wiki.vssec.vic.edu.au/waterrockets/images/0/07/Educator%27s_Manual_%28English%29.pdf)

APRSAF Water Rocket Event

[http://www.vssec.vic.edu.au/events/competitions/
aprsaf-water-rocket-event-and-educators-workshop/](http://www.vssec.vic.edu.au/events/competitions/aprsaf-water-rocket-event-and-educators-workshop/)



SUSTAINABLE LIVING

Waste Limitation Management & Recycling Challenge

Educator's Guide: Activities in science, technology, Engineering & Mathematics, Grade 5-8

http://www.nasa.gov/pdf/396719main_WLMR_Educator_Guide.pdf

