

CATEGORY INTERPRETATIONS

It is impossible to develop category descriptions which can be applied to any and all projects without some questions. In particular, the increasingly interdisciplinary nature of science and engineering means that many projects will draw upon more than one field. To determine a project category, it may therefore be necessary to identify the primary emphasis.

For example, limnology is defined as the scientific study of the physical, chemical, meteorological and biological conditions in fresh water. A project in limnology would be considered from the point of view of its primary emphasis (physics, chemistry, etc.) to be placed in the appropriate category.

Below is a list of project areas about which questions frequently arise. This is not a complete list and is simply given to provide some basis for interpretation of the category descriptions.

Instruments: The design/construction of a telescope, bubble chamber, laser or other instruments would be Engineering if the design/construction were the primary purpose of the project. If a telescope were constructed, data gathered using the telescope and an analysis presented, the project would be placed in Earth and Space Sciences.

Marine Biology: Behavioral and Social Sciences (schooling of fish), botany (marine algae), Zoology (sea urchins) or environmental Sciences (plant and animal life of sea, river, pond).

Fossils: Botany (prehistoric plants), Chemistry (chemical composition of fossil shells, Earth and Space Science (geological ages) and Zoology (prehistoric animals).

Rockets : Chemistry (rocket fuels), Earth and Space Sciences (use of a rocket as a vehicle for meteorological instruments), Engineering (design of a rocket), or Physics (computing rocket trajectories). A project on the effects of rocket acceleration on mice would go in Medicine and Health.

Genetics: Biochemistry (studies in DNA), Botany (hybridization), Microbiology (genetics of bacteria) or Zoology (fruit flies).

Vitamins: Biochemistry (how the body deals with vitamins), Chemistry (analysis) and Medicine and Health (effects of vitamin deficiencies).

Ecology-Environment-Pollution: In a study of the eutrophication of lakes: Behavioral and Social Sciences (the human beings who caused the problem), Chemistry (the process of eutrophication), Botany (growth of algae), Engineering (water purification systems), Medicine and Health (health effects on human beings), Microbiology (effects on microorganisms), Zoology (the fish population) and Environmental Sciences (study of relations between organisms and polluted environment).

Pesticides: Biochemistry (the mechanism of toxic effects), Botany (plant intake and concentration), Chemistry (composition of pesticides), Earth and Space Sciences (mechanisms of runoff), Medicine and Health (effects on human beings and animals).

Crystallography: Chemistry (crystal composition), Mathematics or Computers (symmetry) and Physics (lattice structure).

Speech and Hearing: Behavioral and Social Sciences (reading problems), Engineering (hearing aids), Medicine and Health (speech defects), Physics (sound), Zoology (structure of the ear).

Radioactivity: Biochemistry, Botany, Medicine and Health and Zoology could all involve the use of tracers. Earth and Space Sciences or Physics could involve the measurement of radioactivity. Engineering could involve design and construction of detection instruments.

Space-Related Projects: Note that many projects involving “space” do not go into Earth and Space Sciences. Botany (effects of zero G on plants), Medicine and Health (effects of G on humans), Engineering (development of closed environmental systems for space capsule).

Computers: Computers will no longer be routinely assigned to mathematics. Instead, as a general rule, computer-based projects should first be considered for assignment to the area of basic science on which the project focuses. An example: if the computer is used to calculate rocket trajectories then it would be assigned to Physics, or if the computer is used as a teaching aid or to demonstrate “intelligent behavior” then it should be entered in Behavioral and Social Sciences.

Application of this general rule will usually assign about half of the computer-based projects to one of the basic science categories. The balance will be placed through use of the following guidelines. If the project addresses computer hardware, firmware or system software in terms of design, configuration, construction or testing, then it should be placed in Engineering. If the project addresses use of the computer to perform mathematics or demonstrates the use of general application software (programs, algorithms, languages, graphics, etc.) then it should be placed in Mathematics. Any project not yet assigned through use of the above guidelines should be placed in Mathematics.