

Instructions for Abstract

This must be completed for each project

An abstract of 250 words or less is required and must be submitted with applications for the engineering fair. The abstract must contain a heading that includes a project title and name(s) of the author(s). The heading does not contribute to the word count. The purpose of an abstract is to provide a summary of the project that will inform interested individuals of the contents. The wording must be written in a manner that any scientifically minded individual, who may not be familiar with the topic, can quickly understand the project's important points. Summarize in a few sentences:

1. Background information necessary to understand the project and its importance
2. The problem that was investigated and the hypothesis or goal
3. Outline of the materials and methods used in the actual experimentation
4. Summary of the results obtained from experimentation
5. The conclusions drawn from results
6. The importance or potential applications that the research offers

Do not be concerned with including all of the details in the abstract. The key point to remember when writing an abstract is to keep the wording brief and concise. Use complete sentences. Avoid personal pronouns like "I" and "My." Abstracts should provide only information essential to understand the project's basic points and importance. Omit needless words, especially adjectives and adverbs that have no statistical reference or validity.

SAMPLE ABSTRACT

A Novel Method for Determining Screw Locations during Shoulder Surgery
Stu. D. Finder

People who suffer from shoulder injuries or painful arthritis often have to undergo shoulder surgery to replace the damaged cartilage or bone. Sometimes the surgeons need to screw implants into the bone. It is important for the surgeon to put screws in a place where the screws will not loosen. Ideally this would be in a place where the bone is the thickest.

This project uses a principle that a modified stud finder can locate a hidden bone ridge just like a carpenter who finds a stud hidden behind dry wall. To show that this concept could be successful a larger wooden model of the shoulder joint was made. A commercial stud finder was needed because it provided the electronic circuit for detecting studs. The stud finder's internal sensor was modified to match the curve of the wooden model of the shoulder joint. Voltages were measured at many places across the shoulder cavity. A decrease in voltage of 60% (compared to adjacent bone regions) showed that a hidden bone ridge could be found. These results suggests that a cheap method for locating studs in walls may also work for placing screws in a shoulder joint during surgery. If a medical device is designed using this principle, the problem of incorrectly placing screws during shoulder surgery could be overcome.

Abstract (1B)
Required by all applicants

Abstract (of 250 words or less):