Indiana Academy of Science 2025 Science Talent Search

Abstract Guidelines

Abstracts should be informative and contain the following sections:

- **Background:** A brief statement of study's objectives
- **Methods:** A concise statement of methods
- **Results:** A clear presentation of results
- **Conclusions:** A closing statement of study's conclusions; do not state "results will be discussed.

Note: Abstract length must be limited to 250 words. Abstract title must use all capital letters.

Abstracts often are classified on the basis of content, purpose, and structure. Generally they contain up to four, usually sequential, information elements. As described in the *American National Standard for Writing Abstracts*,[1] these elements state the "purpose, methodology, results and conclusions" of your research.

However, some of you may want to write what is known as a "findings-oriented" abstract in which the most important results or conclusions are placed first, followed by supporting details, other findings and methodology. This type of abstract also is mentioned in the *American National Standard for Writing Abstracts*.

Example 1:

Purpose-oriented abstract[2]

> Ten case reports are presented of facial skin tumors in workers in a charcoal briquette factory who were exposed to coal tar. Six of the incidences occurred in workers inside the factory, and four occurred in workers outside. Principal localizations of the tumors were the nose, eyelids, lips, and ears, with 8, 7, 4, and 2 localizations, respectively. The tumors appeared after periods of exposure of 1 to 43 years. The histologic characteristics of the major types of tumors identified (keratoacanthoma, papilloma, and epithelioma) were not exposure related. Five of the workers had multiple tumors. Five workers who had tumors within the first 10 years of exposure were among those who were most highly exposed to the coal tar. All tumors responded to electrocoagulation and radiotherapy.

Findings-oriented version of the abstract[2]

> Facial skin tumors were identified in 10 workers exposed to coal tar in a charcoal briquette factory. Six of the incidences occurred in workers inside the factory, and four occurred in workers outside. Principal localizations of the tumors were the nose, eyelids, lips, and ears, with 8, 7, 4, and 2 localizations, respectively. The tumors appeared after periods of exposure of 1 to 43 years. The histologic characteristics of the three major types of tumors identified (keratoacanthoma, papilloma, and epithelioma) were not exposure related. Five of the workers had multiple tumors. The five workers who had tumors within the first 10 years of exposure were among those who were most highly exposed to the coal tar. All tumors responded to electrocoagulation and radiotherapy.

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Abstract Guidelines (continued)

Submission due October 30 on website:
https://indianaacademyofscience.org/register/science-talent-search-project-submission-page/?

Example 2:

Purpose-oriented abstract[2]

> Personality characteristics and sex of adolescent drug-abusing and nonabusing groups from middle- and upper-middle class families were compared. The Minnesota Multiphasic Personality Inventory (MMPI) was administered to the two groups. Drug abusers were nonconforming, tended to reject social conventions, and failed to form satisfactory emotional relationships. The MMPI revealed no significant differences between male and female users.

Findings-oriented version of the abstract[2]

> Drug abusers were more nonconforming than nonabusers, tended to reject social conventions, and failed to form satisfactory emotional relationships, according to results obtained with middle- and upper-middle-class adolescents administered the Minnesota Multiphasic Personality Inventory. No significant differences were found between male and female drug users.

Another bit of information that may be helpful follows:

There are four things that make this world go round: love, energy, materials, and information. We see about us a critical shortage of the first commodity, a near-critical shortage of the second, an increasing shortage of the third, but an absolute glut of the fourth. -- Robert A Day

In the preface to his book *How to Write and Publish a Scientific Paper*,[3] Day uses the four words energy, information, love, and materials to underscore his general advice to authors of scientific papers. Before he presents more specific advice on the writing of conference reports, theses, and review papers, and continuing in this preface, Day advises authors on how to alleviate the problem of the glut of information.

> We in science, of necessity, must contribute to the glut. But let us do it with love, especially love of the English language, which is the cornerstone of our intellectual heritage; let us do it with energy, the energy we need to put into the scientific paper so that the reader will not need to use much energy to get the information out of the paper; and let us husband our materials, especially our words, so that we do not waste inordinate quantities of paper and ink in trying to tell the world more than we know.

That which is appropriate for writing of all other components of a scientific or scholarly paper is also appropriate for the writing of the abstract.

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Hints for Writing Good Informative Abstracts

Do:	Don't
scan your document for key facts	change the meaning of your original paper
slant the abstract to your audience	comment on or interpret the document
tell what was found	mention earlier work
tell how the work was done	include detailed experimental results
place findings early in the topical sentence	describe details for conventional apparatus
put details in succeeding sentences	begin abstracts with stock phrases
place general statement last	use involved phraseology
separate relatively independent subjects	use questionable jargon
differentiate experiment from hypothesis	waste words by stating the obvious
be exact, concise, and unambiguous	state the same thing two ways
use short, complete sentences	over-use synonyms
	use a choppy, telegraphic style

The do's and don'ts listed (which were compiled by Weil et al.,[4]) are presented to show another example of rules which apply to the preparation of abstracts.

In a few instances in may be proper to complement a traditional abstract with a chart, diagram, graph, or table. If, in your opinion, such a device would enhance the communication of your research to the Science Talent Search Committee, please attach such a document to a copy of the abstract on a separate sheet of paper.

References

1. American National Standards Institute, Inc., (1979). American national standard for writing abstracts. New York: American National Standards Institute, Inc.

2. Cremmins, Edward T. (1982). The art of abstracting. Philadelphia, PA: ISI Press.

3. Day, Robert A. (1979). How to write and publish a scientific paper. Philadelphia, PA: ISI Press.

4. Weil, B.H., Zarember I., & Owen, H. (1963). Technical abstracting fundamentals, III. Publishing abstracts in primary journals. Journal of Chemical Documents, 3(2), 132-136.