

## Lab Reports - IMRAD

The purpose of a lab report is to describe the results of an experiment or research study. University lab reports follow the style and format of professional journal articles, which research scientists use to share and evaluate each other's work.

Lab report formats vary slightly among scientific disciplines, but all are based on the IMRAD outline: introduction, materials and methods, results, and discussion. The purpose of each section dictates what information to include, regardless of the specialty being written for.

**Helpful Tip:** It is usually easiest to write the methods and results sections first, followed by the discussion and introduction. Title and abstract (if required) should be written last.

### IMRAD format:

Section	Purpose	Content and Characteristics
Title	<ul style="list-style-type: none"> <li>• Describes the content of the report</li> <li>• Allows scientists to locate research of interest when searching databases</li> </ul>	<ul style="list-style-type: none"> <li>• Clear, specific, and accurate</li> <li>• Loaded with keywords drawn from the body of the report</li> </ul>
Abstract	<ul style="list-style-type: none"> <li>• Summarizes the report</li> <li>• Helps researchers decide whether to read the entire paper</li> </ul>	<ul style="list-style-type: none"> <li>• One paragraph (200-250 words)</li> <li>• 2-3 sentences for each section, summarizing key data and ideas</li> <li>• A complete synopsis, not a teaser (results and discussion must be included)</li> </ul>
Introduction	<ul style="list-style-type: none"> <li>• Gives background information needed to understand the current research, tracing the development of existing knowledge</li> <li>• Places the new experiments within the context of the field</li> <li>• Identifies gaps in existing knowledge and shows how the present research will fill them</li> <li>• States the specific objectives of the work</li> </ul>	<ul style="list-style-type: none"> <li>• Reviews relevant literature, including properly formatted citations</li> <li>• Explains why the study was conducted, and what question it was designed to answer</li> <li>• Briefly describes approach to the problem</li> <li>• Outlines hypothesis(es) to be tested, and predicted results</li> <li>• Written in a mixture of present tense (for generally accepted truths) and past tense (when referencing specific research)</li> </ul>

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### IMRAD format continued:

Section	Purpose	Content and Characteristics
Materials and Methods	<ul style="list-style-type: none"> <li>Explains how the experiments were conducted</li> <li>Provides enough detail that another scientist could repeat the experiment</li> <li>Gives readers the information they need to evaluate the validity of results and conclusions</li> </ul>	<ul style="list-style-type: none"> <li>Written in paragraph format</li> <li>Materials are mentioned while describing methods, never listed separately</li> <li>Describes the purpose of each procedure, as well as necessary steps</li> <li>Omits details that are common knowledge or would not impact the results</li> <li>Written in past tense (recounts what was done, rather than giving instructions)</li> </ul>
Results	<ul style="list-style-type: none"> <li>Describes the outcomes of the experiments</li> <li>Draws attention to key findings and relationships</li> <li>Allows readers to form their own conclusions based on the data</li> </ul>	<ul style="list-style-type: none"> <li>Straightforward reporting of observations and calculations</li> <li>Does not include commentary or interpretation</li> <li>Detailed data is presented in tables and figures, which are referenced in the text</li> <li>Written portion should summarize and emphasize, <i>not</i> repeat details shown in the visuals</li> <li>Written in past tense</li> </ul>
Discussion	<ul style="list-style-type: none"> <li>Interprets the results and explains their significance</li> <li>Places the new data in the context of the field</li> <li>Identifies limitations of the study and suggests next steps</li> </ul>	<ul style="list-style-type: none"> <li>References key data, describing its implications</li> <li>Identifies any errors made during the experiment and their impacts</li> <li>Discusses any shortcomings of the protocols or experimental designs</li> <li>Draws conclusions</li> <li>Identifies questions that could not be answered</li> <li>Cites relevant literature</li> <li>Written in past, present, and future tense, as appropriate</li> </ul>
References	<ul style="list-style-type: none"> <li>Provides full bibliographic information, directing the reader to relevant literature</li> </ul>	<ul style="list-style-type: none"> <li>Includes only literature that is cited in the text</li> <li>Follows a consistent scientific citation style, such as APA</li> </ul>