Proper Usage of Laboratory Notebooks

Laboratory notebooks or research journals are important tools used by scientists to document their work. The notebook is used to store information—procedures, equipment specifications, data, and source references—to provide a central location to trace back all research and results. Guidelines for keeping a notebook can be tedious in order to provide integrity and legal credibility to the work recorded. Below are rules for keeping a laboratory notebook that can be omitted or modified as the teacher sees fit for the class:

1. **A laboratory notebook must have pages that are bound.** Loose-leaf pages in a 3-ring notebook or folder can be easily removed or misplaced.
2. **All entries must be written in permanent ink.** This is to prevent any data from being erased.
3. **Any corrections made to written data must have the original data crossed out with a single line, then signed and dated.** All work—including misspelled words, incorrectly transcribed information, or calculation errors—must still be legible to prevent any doubt as to why data was changed. An extra precaution would be to provide a brief explanation (at least two words) as to why the correction was made.
4. **The first page in the notebook includes the title for the project, the name of the researcher, and start/finish dates.** The start date refers to when the notebook is first written in. The finish date is added later when the book is full, or the project has been finished.
5. **Every page has a heading that includes the page number and the notebook title.** This prevents confusion while looking through the book, and the page is already titled in case a photocopy must be made.
6. **Each entry must begin with a date.** This provides a time reference for the work, and the researcher has verified the work as his or her own.
7. **Any additional sheets added to the notebook must be taped on one side, signed on a different side, and not covering anything written on the page.** Only taping one side of the sheet allows a reviewer to easily flip up the page to look for anything underneath. When signing on the side of the sheet, the signature must overlap onto the notebook page to give a reference for the original placement of the addition. Post-it notes are treated as additional sheets to be taped in the notebook in order to prevent any loss of data.
8. **Every page must be signed and dated when completed.** If a large space on the page is left blank, then a single line to slash through the area is drawn and signed/dated to prevent extra data from being added later.
9. **All materials must be listed with brand/manufacturer, lot number, and expiration date (if applicable).** Who made a material and when the material was made can have an effect on how that material performs. Including this information adds to the reproducibility of an experiment.
10. **Data kept electronically must use software that includes an audit trail.** The audit trail will keep track of what and when changes are made. The location of the data can be referenced in the notebook.
11. **After a page has been finished, the work (including any calculations) must be verified by an uninvolved person.** The verifier is not part of the research and will check for information that has been left out. In addition, the verifier will double-check all calculations.
Composition notebooks are used as laboratory notebooks in a school setting. In a corporate or industrial setting, notebooks specifically for laboratory use are ordered, and they already include sections on pages for necessary bookkeeping information (e.g. book title, page numbers, signature lines). For a single research project, a composition notebook might seem wasteful as the student most likely will not use the majority of the pages. Furthermore, as the student may be learning to use a laboratory notebook for the first time, graphic organizers may be more useful to guide the student with knowing what information must be included on the page. Though this contradicts the first rule in using a laboratory notebook (pages must be bound), an example graphic organizer is included as Attachment #1. Each page of the organizer can be used for a different day of collecting data, then all pages can be kept in a binder.