Intermediate Lab Paper Expectations:

You need to tell a story in your paper that revolves around answering a question that you pose. Some labs are geared toward a single question, others will require you to be selective in deciding what to include from the experiment in your paper. The story in your paper should hit on the following points: What is your question and why should anyone be interested? What did you measure and how? How specifically does this measurement help you to answer your question? What did you find out and how confident are you about this result? I encourage you to think of this as being composed of the following pieces

The pieces:

- Question and context
- Images and captions
- Answer to question
- Backing up your answer (Error analysis, χ^2)
- Allowing others to reproduce your results (not relive your experience)

The sections:

You should not expect everyone who picks up your paper to actually read the entire thing. Breaking it up into standard sections allows your reader to jump to the parts that they are truly interested in. The following sections in the following order are fairly standard but you can combine sections if that makes the paper flow more naturally.

- Abstract (required w/ label)
    - Very brief (four sentences or less) with question, prediction, and observed values including their uncertainty.
- Introduction (required w/label)
    - Give context for your question and pose it here. The context might be historical, theoretical, practical, etc.
- Theory
    - Give the framework a physics major would need to understand the theoretical underpinnings of the experiment.
- Procedure
    - Layout your experimental apparatus here (picture/sketch of the experiment is indispensable) and explain the principle behind your measurements. You will be **penalized** for giving a step-by-step history of your time in the lab.
- Results (where results are typically, but not always, conveyed by a graph)
- Analysis/Discussion
    - This should include a discussion of how you found your uncertainties, the predicted value, the observed value, whether they are in agreement or not.
- Conclusions (required w/ label)

- o Tie it all together with a brief summary of your question, the facts needed to answer it and clearly answer your question.
- References (required w/ label)
  - o If you quote from the lab instructions cite them. Cite at least one external source, this might be a textbook, the CRC handbook of Physics and Chemistry for a constant, a website for a predicted value or historical context, etc.

Grading

I'll be looking for these things in your papers with roughly the following weight:

Abstract (w/ key values and their uncertainties)	5%
Intro motivates experiment	5%
Relevant graphs and fits made and incorporated (caption present and discussed in text)	10%
Self-contained (Necessary theory in place, all variables defined, procedure explained)	10%
Image of experimental apparatus included (hand drawing, computer drawing, or clear photograph) with labels and caption	5%
Valid and meaningful comparison made between data and prediction	10%
Error Analysis performed	10%
At least one reference beyond lab instructions referenced.	5%
Performed Experiment	40%

Final consideration

The text that you write will be much more readable if you use the active voice (I did X) rather than the passive voice (X was done). The experiment you do is no less objective if acknowledge that you did it by using the active voice. Generally I am looking for the paper to be no longer than it needs to be. Your words are yours to choose, however I recommend simple language that uses words correctly over arcane terms and excessive jargon used incorrectly.