Experimental Schedule

Sample	Availability
LSMO	Ready
FeS/FeTe (altermagnets?)	Completed/Ready
Fe thin film	Ready
Topological insulator	Shipping label sent, waiting on Oak Ridge

Groups (experiments will run for ~24-72 hours, but you don't have to be on call, will text if need anything from you)

- Oct. 5, Monday 4pm: Ryan, Gavin, Alp **Completed**
- Oct. **27**, Tues. 10:15am: Evan, Jeffrey, Austin (part broke)
- Oct. 16, Friday 5pm: Melissa, Shelby, Leeam **Completed**
- Oct. 20, Tuesday 4pm: Bryce and Tyler TODAY
- Oct. 23, Friday 1:30pm: Nickolai and Durham

Good/Bad Graphs
Bring in examples of good and bad graphs from a paper. I don't need the whole paper. Discuss why you think they are good or bad. DO NOT just google looking for good and bad graphs. I want YOU to practice recognizing what makes a graph good or bad-- not someone else. It's ok if we disagree on what is good or bad.

Why Important Papers and Proposal deadlines? Because the Lab Notebook is *supposed to be* a second try on the same questions. And a second round of feedback.

Date	293 Topic	Homework (with goals color)
18-Aug	Pre-Surveys; What is this Class About?	Partner/Scheduling Info
20-Aug	Distinguishing Types of Magnetism	Reading 1 on Perusall
25-Aug	Holcomb Group Discovery	Reading 2 on Perusall
27-Aug	MOKE versus Other Magnetometry	Watch Video on Perusall
1-Sep	Project Planning: What Kinds of Magnetic Measurements	Syllabus Read/Agree
3-Sep	Finding Published Papers Relevant to Your Project	Bring a Related Paper to Class
8-Sep	Reading and Evaluating Papers	
10-Sep	Best Practices with Lab Notebooks 50% after Oct 22	University Safety Requirement
15-Sep	MOKE Hands-On Demonstration	
17-Sep	VSM Hands-On Demonstration 50% after Oct 13	Important Papers. Why? (2-5)
22-Sep	How to Give Peer Feedback and Group Project Planning	
24-Sep	Planning Group Oral Reports and Peer Grading	Mini Reports (in class)
29-Sep	Group Project Planning and Refinement	Quality Reading on Perusall
1-Oct	Assessing the Quality of Materials 50% after Oct 13	Project Proposal
6-Oct	Best Practices with Graphing 50% after Oct 22	Good/Bad Graphs
8-Oct	Fall Break (No Class)	
13-Oct	Introduction to Excel: Spreadsheets, Graphing and Fitting	
15-Oct	Understanding and Processing Your Data	Lab Notebook Check-In
20-Oct	Building a Story with Your Data When It Isn't Obvious	
22-Oct	Check-In and How Are Materials Grown I could do another topic. Any requests?	
27-Oct	How to Give a Good Talk	
29-Oct	Peer Evaluation of Lab Notebooks (Bring Notebooks)	Can submit early for feedback
3-Nov	Election Day (Vote If You Can)	
5-Nov	Project Speed Dating: Share Your Project with Others	Graphs of Your Data 5% Bonus
10-Nov	Time for groups to Discuss Presentation/Data Planning	
12-Nov	10-15 Min Group Presentations FeS/LSMO	Presentations
17-Nov	Rest	Presentations No Bonus
19-Nov	How to Write a Good Abstract	
1-Dec	Ask Your Final Questions of Instructor, Partners or Class	5% on time bonus
3-Dec	Discussion of Research and Scholarship Opportunities	Abstract & Notebook

When we submit a paper in science, it almost never gets accepted right away. We get feedback, and we have to address that feedback, or it doesn't get published. Sometimes there are a few rounds of this. Submitting too late means less

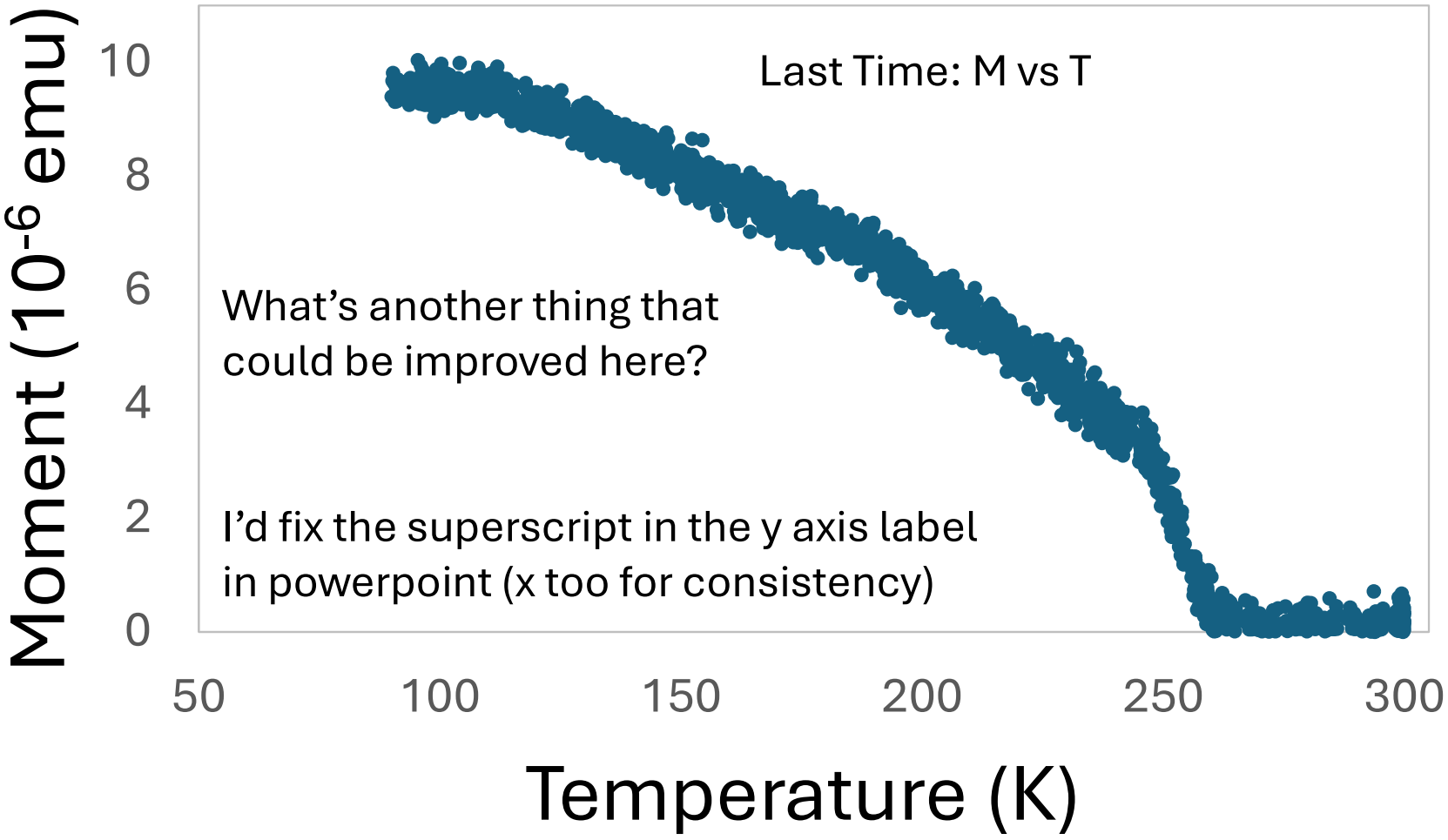
Lab Notebook Rubric (Early lab notebook focuses on experiment planning/motivation.)

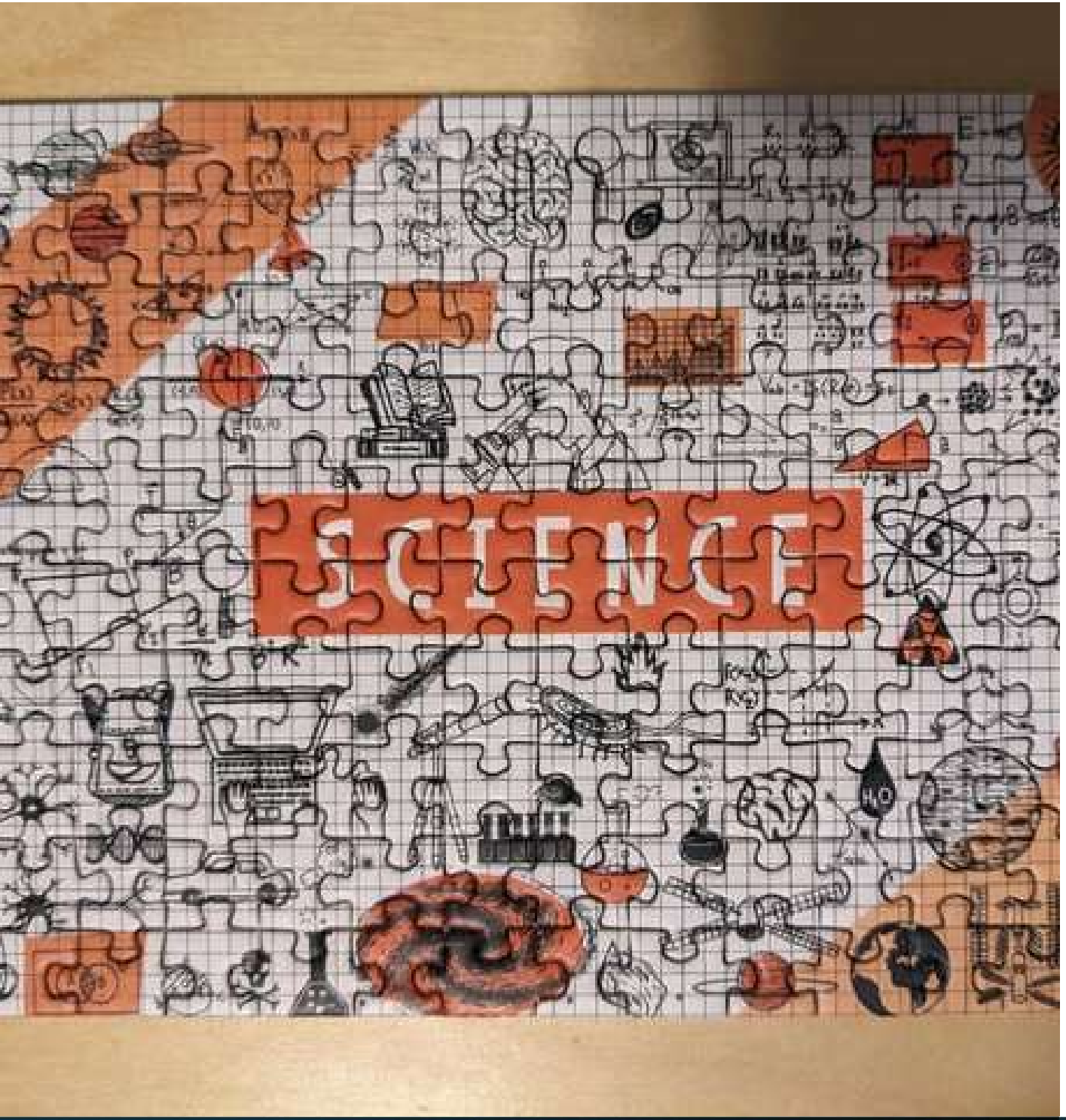
Category	Far below threshold (1)	Below the threshold (2)	Meets the threshold (3)	Exceeds the threshold (4)	Score
Introduction/ Motivation/ Goals	Does not include background or previous work. Does not identify the purpose, the project, the main question(s) or issue being addressed.	Gives very little background or information. May include the main question(s) or issue but does not identify the purpose for addressing them.	Gives a listing of the background information and previous work but does not tie them together well to show how they lead to the purpose of the present work and the questions being addressed.	Effectively ties background to the research question(s) and purpose that directly leads into the question(s) being addressed and the purpose of the research.	
Figures explaining the background Description of material uniqueness	Only one figure is provided that relates to the background of the experiment or material. The relevance of the figure is unclear or not explained. The uniqueness of the material selected is not addressed, or is very general, **such as saying "it hasn't been studied before."** Why might we expect it to be interesting?	One or more figures related to explaining the key concepts of the experiments are included. Only one is well discussed and related to the project. Attempts to explain the uniqueness of the material, but the rationale for its interest or value is unclear.	Two or more figures related to explaining the key concepts of the project are included. One may not be explained well or relation clear. It is communicated what is unique about the material that was selected by the group and at least one application of the material is discussed.	At least two figures clearly illustrate and reinforce the key background concepts and are well integrated into the narrative. It is well communicated what is unique about the material that was selected and potential material applications (and their importance) are discussed.	
References	Referenced information is insufficient to verify where the information was found.	While a reference list exists within the lab notebook, it's not always clear what information was taken from the sources. Formatting poor.	While references are in a nice list and near where the information is mentioned, it could be more clear exactly what information is taken from the reference.	References are cited inline with short names (such as "NIST"), enabling the reader to easily trace information and a full reference list occurs elsewhere.	

This is a step up from Why Important. $\frac{3}{4}$ here is still good!

You must have references to not score a zero here!

Start with MvsH walkthrough





Today's Goal

Building a Story Particularly When Unclear and/or Unfinished

Building a Story Particularly When Unclear and/or Unfinished

1) We always knew it would be hard to finish our projects within one course
2) Research frequently takes longer than expected (2 hours/weeks/months generally not enough)

Thus, it's not uncommon to have to tell an incomplete story at a conference. Think of it as a work in progress. It can be useful to get feedback along the way!

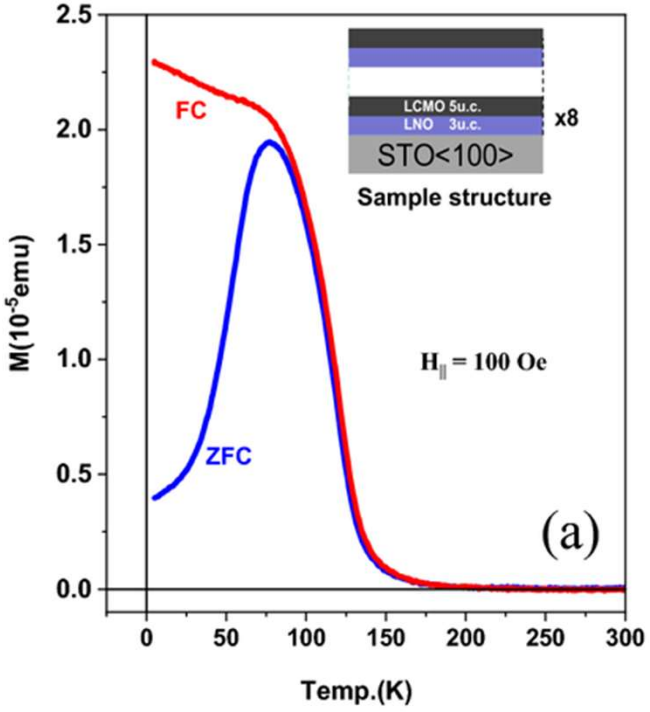
Building a Story When Not Clear or Unfinished

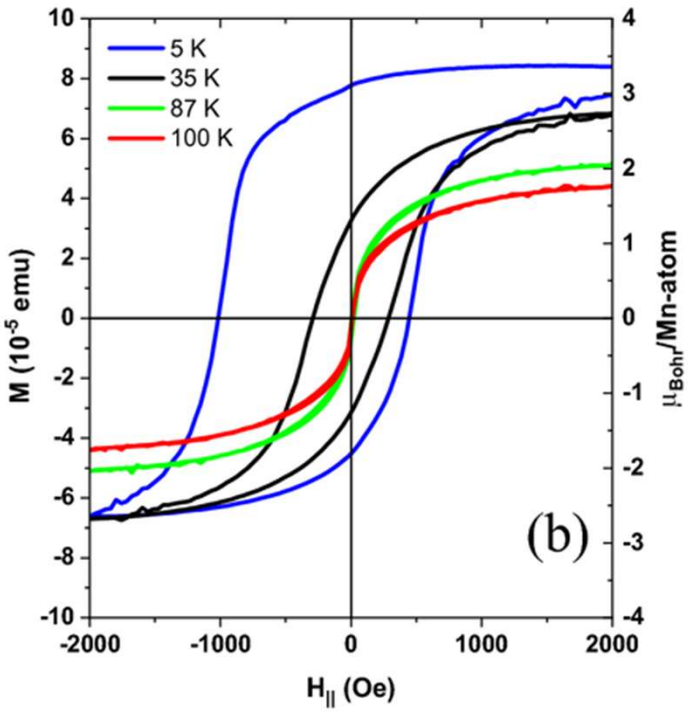
Particularly as undergrads doing research, you get a lot of leeway.

We don’t expect you to be experts. However, we do expect you to have a purpose and at least a rough idea of what you expect to see.

Example 1: What did/will we measure

- Magnetization versus temperature at a particular couple of fields (ZFC and FC)
- Magnetization versus field (hysteresis loops) at several temperatures

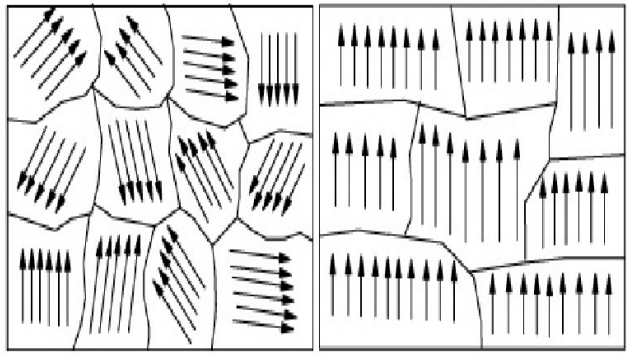




To build a story, you need to compare how things change

What are some things that change here?

What is going on in this example?



What would you compare here?

- Ms, Mr, Hc, one other thing here
- This would be an example where taking more loops would help

