

OUTCOMES OF A SIGNATURE WORKING GROUP: SCAFFOLDED, SCIENTIFIC LAB NOTEBOOK ASSIGNMENTS FOR FOUR COURSES

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A goal common to all lab-based courses taught by physical sciences faculty, from rFLA-Science seminars to our 400-level electives, is teaching students to study the world by applying the scientific method. Scientists make observations, develop hypotheses, test and collect experimental data, analyze the results, and accept or reject their hypothesis. This process typifies a divisional “way of knowing.” Traditionally, records of the scientific method process are organized in a discipline-specific structure known as a “lab notebook.” Notebook record-keeping typically includes three parts: preparatory notes, a detailed, real-time written record of experimentation procedures and observations, and reflection on and analysis of the data. It is at its essence a comprehensive record of the application of the scientific method. The chemistry/physics faculty have all found teaching good notebooking practices very challenging and have struggled with student resistance/arguments about its relevance and broad failure of notebook quizzes, reflecting a persistence of poor notebooking execution through the 300- and 400-level. Indeed, we find that the only time we see true comprehension of the importance of lab notebooking is too little, too late: when students engage in collaborative scholarship in our research labs and they fail to reproduce experiments because they failed to keep accurate notes. Given the central importance of this skill, we designed scaffolded 100-, 200-, and 300-level notebooking assignments. The aim was to create a framework built on universal design principles that can be adapted for any physical science course, from general education (rFLA) through our 400-level courses, because lab notebooking ultimately has the same purpose in any context. We will present the results of deployment of select notebooking assignments along with reflections on their effectiveness and revisions for future assessments.