**Appendix A: Collaborative Inquiry Project Instructions**

Collaborative engagement in scientific inquiry is a cornerstone of scientific discovery and is a valuable component of science instruction. During the semester, you will participate in a collaborative scientific inquiry project. Each of you will be assigned to a small group (2–4 students) that will engage in a hands-on, collaborative project. Your group will identify a question that interests you (related to the guided inquiry activity you just completed) and design and conduct an investigation to help answer that question. As a group, you will document your communication and progression through the inquiry using the group discussion board (or other communication tools of your choosing). Keeping detailed communication records is important, and evidence of group communication occurring outside of the group discussion board must be shared with the instructor as part of your final project reflection.

For this project, you will turn in (1) a group digital science notebook and (2) an individual reflective paper over your experiences. The details for each portion of the project are below.

**Digital Science Notebook\*\***

Each group will submit a Digital Science Notebook entry that contains the following information:

1. Research question your group investigated.
2. Background Information: Your group will need to conduct some basic background research on the topic in order to help you make sense of your data—scientists do this as part of every investigation they complete.
3. Methods used to investigate the research question.
4. Data Collected: Data should be included in an appropriate visual display (e.g., table, graph, or diagram)
5. Your Conclusions: Your conclusions should be based on BOTH the data your group collected AND your research into the scientific content knowledge.

\*\*A digital notebook entry is simply a digital format for capturing and communicating information. You can use any format you prefer as long as your product on its own fully presents the elements listed above. Some possibilities are:

* A Prezi with audio/video embedded
* Google Slides/PowerPoint with audio/video embedded
* An Adobe Spark presentation/video
* A Padlet
* A blog
* A digital poster
* Your idea?

**Individual Reflection**

The intent of this portion of the assignment is to complete a reflective analysis and evaluation of your experiences participating in the collaborative inquiry project with your group. Your paper should be approximately 2–3 double spaced pages (with 1-inch margins and a 12-point font) and answer each of the following questions in detail:

1. How was your experience with collaboration? What worked well? What was challenging?
2. What strategies did you use for communicating with each other and managing the project remotely? Please provide evidence or a summary of anything else you used besides your group discussion board.
3. How did you and your group mates support and complement each other? How did you define your roles and tasks within the group?
4. How do your experiences working collaboratively on this project impact your perceptions about how you might incorporate collaborative experiences in your own classroom (both face to face and remote)?

**Appendix B: Example Research Questions Explored by Students**

**University 1: Oobleck**

* How does temperature affect Oobleck’s properties?
* What happens to Oobleck if you add a greater proportion of water or cornstarch?
* What properties occur when cornstarch is mixed with liquids other than water?
* Does Oobleck behave differently from when it is fresh compared to when it has been sitting out for an extended period of time?
* Does the temperature of the water affect the properties of Oobleck?
* Will changing the liquid substance to milk, juice, oil, or vinegar, rather than water, in the Oobleck affect the consistency or overall outcome of the experiment?
* How does baking Oobleck in the oven affect its physical properties?
* What happens if we substitute flour for cornstarch?
* Can an item sink into Oobleck to the depth of 1 inch?

**University 2: Hot Wheels**

* How does the position of the loop impact the speed of the car?
* How does the ramp material impact the distance the car travels?
* How does the mass of an object affect the distance it travels?
* How does the height the car is launched from impact how far the car travels backward after hitting the wall?
* How does the material that the Hot Wheels car collides with affect the ricochet distance of the car?
* How will the transfer of kinetic energy to Car 2 (sitting at the bottom of a ramp) change depending on the potential energy of Car 1 (at the top of the ramp) and/or the length of the ramp?
* How will the friction of various surfaces affect how far a Hot Wheels car can go after being released down a ramp with constant height?

**Appendix C: Example Student Research Projects**

Timeline

Description automatically generated

Calendar

Description automatically generated with low confidence