

**Title:** Scientific Method Unit Timeline

**Grades:** 10-12 Biology

**Protocol:** Birds

**Abstract:**

This unit will be used at the very beginning of the school year to introduce the scientific method. The unit will take about 12 days. We will go through notes over scientific method and various activities to reinforce each step of the method. I will incorporate a bird study at the end of the unit to have the students go through an entire experiment and lab write-up. The students will need to be familiar with common birds first, which we will spend a few days working on. Then the classes will be put into groups of 3 to think of a research question they want to answer involving birds and their abundance or diversity in the schoolyard. The students will need to develop a hypothesis and an experimental design to begin. They will have 2 days in class to collect data and then they will analyze their data and write a formal lab report.

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## Scientific Method Unit Timeline

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**School:** Mountain View High School

**Grades:** 9-12

**Protocol:** Birds

**Brief Description:** This is a beginning unit to introduce the students to the scientific method. The students will actually go through the steps of the scientific method process and carry out an experiment over this 12-day unit.

| Day | Standard or Objective  | Activity   | Materials   |
|-----|--|--|---|
| 1   | Obj: Know the difference between an observation and an inference.                          | Introduce observations and inferences; do skull observation lab<br><b>HW:</b> Study questions on skulls  | Observation/Inferences Notes, skulls, skull worksheet, study question worksheet   |
| 2   | S1C1: PO2<br>Develop questions from observations that transition into testable hypotheses. | Finish skull lab; Begin notes on scientific method- step 1 and 2; Practice writing hypothesis worksheet<br><b>HW:</b> Finish hypothesis worksheet  | Skulls, Scientific Method Note slides, hypothesis worksheet   |
| 3   | Obj: Be able to identify a dependent and an independent variable.                          | Continue scientific method notes-steps 3 and 4; Practice worksheet with independent and dependent variables; Practice writing prediction statements and explain variable charts<br><b>HW:</b> None | Scientific Method Note Slides, prediction statement worksheet, IV/DV worksheet  |
| 4   | Obj: Be able to write an analysis and a conclusion for a formal lab report.                | Finish Scientific method notes-steps 5 and 6; Do graphing rules and jigsaw graph activity; Practice writing analysis and conclusion worksheet<br><b>HW:</b> Finish conclusion ws                   | Scientific Method Note Slides, graphing rule worksheet, graphing checklist, jigsaw activity (graph info, colored pencils), conclusion worksheet |
| 5   | S1C2:PO2<br>Identify the resources needed to conduct an investigation.                     | Introduce bird project; begin teaching bird ID w/ flashcards and classify activity; talk briefly about bird behavior<br><b>HW:</b> watch birds in yard for 20 minutes tonight.                     | Bird project ws, bird classify cards and info, flashcards, bird behavior worksheet  |

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|----|---|--|--|
| 6  | S1C2: PO2<br>Identify the resources needed to conduct an investigation.   | Review birds and go out on campus to look at birds; Look for different sites to put birdseed out.<br><b>HW:</b> think of question  | Binoculars, bird ID books, flashcards                  |
| 7  | S1C1: PO3<br>Formulate a testable hypothesis.<br>S1C2:PO3<br>Design an appropriate protocol for testing a hypothesis.   | Do pre-lab write up with group of 3; Have question, hypothesis, prediction statement, and experimental design done; Give list of materials to teacher for tomorrow!<br><b>HW:</b> None | Data tables, instructions                              |
| 8  | S1C2:PO4<br>Conduct a scientific investigation that is based on a research design.<br>S1C2:PO5<br>Record observation, notes, etc using charts, graphs, etc.   | Perform experiment and collect data<br><b>HW:</b> bad graph ws   | Data tables, bad graphs worksheet                      |
| 9  | Same as day 8   | Perform experiment and collect data<br><b>HW:</b> scientific method ws   | Scientific method worksheet                            |
| 10 | S1C3: PO2, PO4, PO7<br>Evaluate whether data supports hypothesis, identify possible errors, propose further investigations<br>S1C4:PO2, PO3<br>Produce graphs that communicate data clearly and logically | Do post lab write up in class with group; Do graph, analysis, and conclusion; Record data on group sheet to share results.<br><b>HW:</b> finish lab write-up for tomorrow              | Group data table overheads                             |
| 11 | S1C4:PO1, PO3<br>Communicate results clearly and logically  | Discuss class results; scientific method review; test tomorrow<br><b>HW:</b> study for test  | Class result overheads, scientific method review sheet |
| 12 | Obj: To test knowledge of the scientific method.  | Scientific Method Test   | Test   |