~Apologia Physical Science~
Lesson Plans and Guide for Modules 9-16

You are now familiar with how to write up lab experiments using a basic format. Since most of the remaining modules in this text involve more mathematical formulas and the introduction to physics may be more challenging, lab experiment documentation will be shortened to include the title of the experiment and the date, observations and data, and a conclusion or summary discussing what was done and learned doing the experiment.

Title | Date | Observations/Data | Conclusion/Summary
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A scientist biography activity is scheduled during Module 13. This is an optional activity, not included in the text.

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<th>2nd semester</th>
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<tr>
<td><strong>OPTIONAL Co-op Day:</strong></td>
<td>Discuss goals and lesson plans of this semester. Introduce formulas for speed, acceleration, and distance from Module #9 and practice solving sample problems. (Refer to Examples or make up your own.)</td>
<td>Need paper, pencil, and eraser. Mom can use a large chalk or marker board for visual ease to work problems.</td>
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<td><strong>#1 Co-op Day:</strong></td>
<td>Do Experiments 9.1 and 9.3. Need four eggs, two strips of strong cardboard, several books, scissors, newspaper, paper towels, a stopwatch, a heavy ball or rock, chair or small stepladder, a tape measure, a pencil.</td>
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<td><strong>#2 Co-op Day:</strong></td>
<td>Do Experiments 10.1 and 10.2. Need a coin, a 3 x 5” index card, a small glass, a raw egg, a hard-boiled egg, aluminum pie pan, scissors, a marble.</td>
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<td><strong>#3 Co-op Day:</strong></td>
<td>Do Experiments 10.3 and 10.4. Need an unfinished board at least 2 ft. long, a block eraser, an ice cube, a small block of wood, a relatively flat rock, sandpaper, books, a ruler; a plastic, 2-liter bottle, a stopper that fits the bottle, a cup of vinegar, two teaspoons of baking soda, aluminum foil, four pencils.</td>
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<td><strong>Week 20</strong></td>
<td>Test for Module #10 (bring with you to next co-op)</td>
<td>Module #11 Read pp 261-265. Do OYO.</td>
<td>Read pp 265-269. Do OYO p. 269 &amp; define terms.</td>
<td>No assignment</td>
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<td><strong>#4 Co-op Day:</strong></td>
<td>Do Experiment 11.1. Need a mechanical pen, a black marker, thin white string or thread, 5 metal washers (all the same size), a stopwatch, safety goggles or glasses, scissors.</td>
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<td><strong>#5 Co-op Day:</strong></td>
<td>Do Experiments 11.2 and 11.3. Need a soft seat cushion from a couch, a bowling ball, a marble, two baseball size balls, a stopwatch, a large, open space.</td>
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<td><strong>Week 22</strong></td>
<td>Test for Module #11 (bring with you to next co-op)</td>
<td>Module #12 Read pp 289-294. Do OYO.</td>
<td>Read pp 295-299. Do OYO.</td>
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<td><strong>#6 Co-op Day:</strong></td>
<td>Do Experiments 12.1 and 12.2. Need two balloons, thread, cellophane tape, a glass, a plastic lid that fits over glass (can be larger, but not smaller), a paper clip, two 5 cm x 1.5 cm strips of aluminum foil, a balloon, a pair of pliers.</td>
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### #7 Co-op Day:
Review tests. [Receive assignment to write a brief biography on one of the following scientists that contributed to the development of the Periodic Table of Elements: **Johann Dobereiner, John Newlands, Julius Lothar Meyer, Dmitri Mendeleev, Henry Moseley, Glenn Seaborg.** This assignment is optional of course. *]

| Week 24 | **Test for Module #12**  
(bring with you to next co-op) | **Module #13**  
Read pp 317-323.  
Do OYO. | Read pp 323-top of 328.  
Do OYO. | Read 328-332.  
Study Example 13.3.  
Do OYO. |

### #8 Co-op Day:
Review tests. [Discuss progress of biography assignment. Due next week!]

| Week 25 | Read pp 333-337.  
Study Example 13.4.  
Do OYO. | Read pp 337-340.  
(bring with you to next co-op) |

### #9 Co-op Day:
[Read aloud biographies.] This could be your break week if not doing biography assignment.

| Week 26 | **Module #14**  
Read pp 345-348.  
Define boldface terms.  
Do OYO. | Read pp 348-351. | Read pp 351-355.  
Study Examples 14.2 & 14.3.  
Do OYO. | |

### #10 Co-op Day:
Do Experiments 14.1 and 14.2. Need plastic wrap, scissors, tape, candle, matches, plastic 1- or 2-liter bottle, large pot, wooden spoon, large bowl, uncooked rice, two medium-sized rocks, a stopwatch, a 250-meter stretch of sidewalk, or paved road, a tape measure or meterstick.

| Week 27 | Read pp 355-360.  
Define boldface terms.  
Do OYO. | Read pp 361-362.  
Do Exp. 14.4 at home this week.  
Do OYO. | Read pp 363-368.  
Do OYO. | |

### #11 Co-op Day:
Discuss observations and conclusions of Experiment 14.4. Do Experiments 14.3 and 14.5. Need water, a glass bottle (approximately 2-liter) with a narrow neck; a stringed instrument like a guitar or a plastic margarine tub, a rubber band.

| Week 28 | Do Study Guide pp 371-372. | **Test for Module #14.**  
(bring with you to next co-op) | **Module #15**  
Read pp 373-376.  
Do OYO. | Read through Exp. 15.1 p 377. |

### #12 Co-op Day:
Do Exp. 15.1. It must be a SUNNY DAY! Need a flat pan (like a cake pan), a medium-size mirror, a sunny window, a plain white sheet of paper, water.

| Week 29 | Read pp 377-top of p 381.  
Define boldface terms.  
Do OYO. | Read pp 381-384.  
Do OYO. | Read pp 385-387. | |

### #13 Co-op Day:
Do Experiments 15.2 and 15.3. Need a flat mirror, two sheets of white paper, a pen, a protractor, a flashlighthouse, a sheet of black construction paper, tape; a square or rectangular glass or clear plastic pan, water, milk, a spoon, flashlight with cover from 15.2, a ruler.

| Week 30 | Read pp 388-393.  
Do OYO. | Read pp 393-397. | Read pp 397-400.  
Do OYO. | |

### #14 Co-op Day:
Do Experiments 15.4 and 15.5. Need a quarter, a deep, nontransparent bowl, water, a pitcher; two plain white sheets of paper, a bright red marker.

| Week 31 | Do Study Guide pp 403-404. | **Test for Module #15**  
(bring with you to next co-op) | **Module #16**  
Read pp 405-408.  
Define terms.  
Do OYO. | Read through Exp. 16.1 p 425.  
(We did this ahead to finish co-op by a certain date.) |

### #15 Co-op Day:
Do Experiment 16.1. Need a balloon and two colors of markers. Review tests.

| Week 32 | Read pp 409-412.  
Define terms.  
Do OYO. | Read pp 412-417.  
Define terms.  
Do OYO. | Read pp 417-422.  
Define terms.  
Do OYO. | Read pp 422-427.  
Do OYO. |

Week 33 | Do Study Guide pp 430-431. | **Test for Module #16**  
(have mom grade it) | |

### CONGRATULATIONS!
You have completed *Exploring Creation with Physical Science!*
Way to go! Have a great summer!

* [http://members.optushome.com.au/scottsoft/Pintro.htm](http://members.optushome.com.au/scottsoft/Pintro.htm) This site is a good place to find some biographical info on the scientists.