## Learning Module Outline

### Learning Objectives

**Student Learning Objectives for this module**

Upon completion of this module, you will be able to:

- Design and conduct an experiment, and write a laboratory report
- Reach conclusions about the physical world using experimental design processes
- Develop a research project report using supporting media
- Create a spreadsheet using Excel/Calc to make charts and graphs
- Demonstrate the basic principles of experimental design by collecting and analyzing data
- Record your processes and data in a science log
- Conduct data analysis and reporting using the SPSS software
- Use PowerPoint/Impress to presenting your data findings

### National Educational Technology Standards (NETS)

**Standards**

- Collaborate with peers, experts, and others to contribute to a content-related knowledge base by using technology to compile, synthesize, produce, and disseminate information, models, and other creative works
- Routinely and efficiently use online information resources to meet needs for collaboration, research, publications, communications, and productivity
- Select and apply technology tools for research, information analysis, problem-solving, and decision-making in content learning

### Learning Resources

**Required Resources**

- Science log book
- Physics text book
- Microsoft office (Excel and PowerPoint)
- Open office (Calc and Impress); [http://www.openoffice.org/](http://www.openoffice.org/)
- SPSS software

**Additional Resources**

- Assessment Rubric
- Digital camera (use of cell phone is accepted)
- Internet Resource site; [http://probesight.concord.org/](http://probesight.concord.org/)
### Faculty-created Online Learning Activities

<table>
<thead>
<tr>
<th>Self-assessment and Learning Activities to be created by the faculty</th>
</tr>
</thead>
</table>
| • Flash cards  
• Glossary (comprise of text and images)  
• Fill-in-the-blank  
• Practice Questions  
• Fact Cards  
• Matching  
• Crosswords  
• Challenge  
• Quiz  
• Pick a Letter |

### Learning Activities

<table>
<thead>
<tr>
<th>Activities for this module to master the basics</th>
</tr>
</thead>
</table>
| • Complete the online learning activities  
• Engage in a lab experiment using experimental design techniques  
• Use Excel/Impress to record your data findings for a science log  
• Using digital cameras to capture your processes and data  
• Install SPSS and insert data from your lab experiment for data analysis  
• Learn basic features of PowerPoint and Impress  
• Develop your Presentation using PowerPoint or Impress template |

### Self/Peer Assessment

<table>
<thead>
<tr>
<th>Opportunities for students to check their progress and receive feedback</th>
</tr>
</thead>
</table>
| • Use a Wiki to develop their lab report (add scanned graphs and images); See Lab rubric  
• Use a blog to provide text and online resources found to support your topics  
• Journal for reflection on each lab experiment and processes observed  
• Participate in a Discussion board on experimental design processes  
• Develop a group glossary on key physics terminologies |

### Graded Assessment

<table>
<thead>
<tr>
<th>Evidence to proceed</th>
</tr>
</thead>
</table>
| • Upload final Lab report assignments  
• Presentation of your findings  
• Participation in discussion board explanations of the experiments  
• Complete assigned tests  
• Completed Wiki |
# Group and Individual Assessment Rubric

## Plunging Into Physics

### Group Assessment Rubric

<table>
<thead>
<tr>
<th>Student:</th>
<th>Group:</th>
<th>Class Period:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Experimental Design</strong></th>
<th><strong>Conducting the Experiment</strong></th>
<th><strong>Analysis</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The question is worthy and can be answered by the experiment. Plan shows effective and reliable data collection procedures.</td>
<td>Sufficient and accurate data is collected. Data is well organized. Tables or charts made interpretation clear.</td>
<td>Logical conclusions are based on the data and connect to the scientific principles being studied.</td>
</tr>
<tr>
<td>The question is worthy. The experimental design is generally strong, but links between question and plan are unclear.</td>
<td>Data is accurate, but more data would improve interpretation. Tables and charts are appropriate.</td>
<td>Data analysis may be generally accurate, but does not make strong connections to scientific principles.</td>
</tr>
<tr>
<td>The question and experimental design do not match. Additional support is needed to plan project.</td>
<td>Data may be inaccurate or limited, making interpretation difficult. Tables and charts are needed.</td>
<td>Analysis is flawed or does not lead to conclusions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Presentation</strong></th>
<th><strong>References</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Science concepts are expressed well. Presentation is well organized and effective. Multimedia supports presentation.</td>
<td>References are complete and properly cited.</td>
</tr>
<tr>
<td>Science concepts are presented, but not in depth. Presentation is generally organized and effective. Multimedia supports the presentation, but may distract from the message to a degree.</td>
<td>References are complete, citations may need work.</td>
</tr>
<tr>
<td>Concepts are not presented in an effective or organized manner. Multimedia does not support the message.</td>
<td>References are incomplete or poorly cited.</td>
</tr>
</tbody>
</table>

Group Score: ________ / 15
### Individual Assessment Rubric

<table>
<thead>
<tr>
<th>Participation</th>
<th>Score</th>
<th>Class Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative team member who shows leadership. Contributes significantly to group effort. Uses time and materials properly.</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Cooperative team member. Contributes to group effort. Uses time and materials properly, may need reminders.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Does not contribute fully to team effort, or distracts partners. Problems with time and materials management interfere with group’s progress.</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Rate yourself on a scale from 1 to 5 on the level of participation in the project, with 1 being the least involved to 5 being a major contributor of ideas and effort.

1 2 3 4 5

Participation Score + Self Evaluation = Total Individual Score ____________/10

Reference: