



<p><b>Bloom:</b>  <b>Synthesis</b>  <b>Evaluation</b>  <b>Analysis</b>  <b>Application</b>  <b>Comprehension</b>  <b>Knowledge</b></p>	<ol style="list-style-type: none"> <li>7. <b>Identify</b> potential safety hazards and <b>explain</b> how it reduce risk. (13.A.3a)</li> <li>8. Conduct an <b>experiment</b> that controls all but one variable. (11.A.3b)</li> <li>9. Collect and <b>record</b> data. (11.A.3c)</li> <li>10. <b>Analyze</b> data by <b>creating</b> data tables and graphs in Microsoft Excel. (10.A.3a)</li> <li>11. Explain the existence of unexpected results in a data set. (11.A.3d)</li> <li>12. <b>Calculate</b> mean, median, mode and range of the data as appropriate for the particular experiment. (11.A.3e; 10.A.3b)</li> <li>13. As appropriate, some students will <b>calculate</b> standard deviation and experimental error for their project.</li> <li>14. <b>Interpret</b> and represent results of <b>analysis</b>. (11.A.3f)</li> <li>15. <b>Compose</b> a final report based on the Illinois Junior Academy of Science Policy Manual expectations.</li> <li>16. <b>Report</b> and <b>display</b> the process and results of their investigation at the K-12 Waterloo District Science Fair. (11.A.3g)</li> </ol> <p>Some students will be invited to participate at the Regional Science Fair held in March at Southern Illinois University at Edwardsville.</p> <p>Some students will earn an invitation to participate at the State Exposition of the Illinois Junior Academy of Science held in May at the University of Illinois.</p>
<p><b>Rationale</b></p>	<p><b>Why Goal 11 Is Important:</b> The inquiry process prepares learners to engage in science and apply methods of technological design. This understanding will enable students to pose questions, use models to enhance understanding, make predictions, gather and work with data, use appropriate measurement methods, analyze results, draw conclusions based on evidence, communicate their methods and results, and think about the implications of scientific research and technological problem solving. (Source: <a href="http://www.isbe.net/ils/science/word/goal11.doc">www.isbe.net/ils/science/word/goal11.doc</a> )</p>
<p><b>Key Curriculum Components</b></p>	
<p><b>How will you engage the learner?</b></p>	<p>A variety of activities are used to engage the learner in selecting a topic of their own choosing!</p> <ul style="list-style-type: none"> <li>• Students read 'letters of advice' from the previous eighth grade class. Many students will find letters from students that they know.</li> <li>• Programs from the previous school fair are shared...complete with the names of the exhibitors and project titles.</li> <li>• Partner Contracts are offered and students may choose to work with a partner!</li> <li>• Colorful posters are displayed with photographs and newspaper articles praising the accomplishments of students who have participated in science fair since 1992 when the K-12 Waterloo District Science Fair began!</li> <li>• Scrapbooks of science fair participants and winners from previous years are available for students to look at.</li> <li>• In 2006, WHS student and three-time Intel International Science &amp; Engineering Fair participant, Jonathan Naber presented a Power Point presentation highlighting his experiences in International competition! This included a video segment provided by Science Service.</li> </ul>
<p><b>Individual Student Assessments</b></p>	<ol style="list-style-type: none"> <li>1) Review of Literature Process Grade Sheet (100 pts)</li> <li>2) Review of Literature Final Paper Grade Sheet (100 pts)</li> <li>3) Data Table Quiz (32 pts)</li> <li>4) Graphing Quiz</li> <li>5) Final Project Paper (212 pts)</li> <li>6) Display Board (100 pts)</li> <li>7) Journal (100 pts)</li> </ol>

<b>Final Team or Project Based Performance</b>	The culminating activity for all students is to exhibit their projects at the K-12 Waterloo District Science Fair and receive at least a ribbon for their efforts! A team of two volunteer judges using the Judges' Score Sheet evaluates all projects.
<b>Teaching and Learning Events</b>	<ol style="list-style-type: none"> <li>1) Engaging the learner activities.</li> <li>2) Getting to know students' abilities and personal interests/hobbies/science fair goals.</li> <li>3) Visiting the school library to consider print resources available.</li> <li>4) Utilizing the school network/Internet access in the computer lab to research possible topics and seek information for the Review of Literature.</li> <li>5) Using the online APA citation assistance at: <a href="http://www.citationmachine.net">www.citationmachine.net</a></li> <li>6) Investigating the Illinois Junior Academy of Science website at: <a href="http://www.ijas.net">www.ijas.net</a></li> <li>7) Gathering a minimum of five different references to complete the Review of Literature.</li> <li>8) Preparing Source Cards, Note Cards, an outline, rough draft of the Review of Literature with a minimum of five internal citations and a corresponding Reference List.</li> <li>9) Conducting an experiment controlling all but one variable.</li> <li>10) Recording events in the science journal (Mead composition book) with a minimum of six different dated entries.</li> <li>11) Creating data tables and graphs in Microsoft Excel and analyzing the results.</li> <li>12) Identifying possible sources of experimental error.</li> <li>13) Preparing a final report based on the Illinois Junior Academy of Science Policy Manual expectations.</li> <li>14) Reporting and displaying the process and results of the investigation at the K-12 Waterloo District Science Fair.</li> </ol>

### Differentiation Documentation Form

Strategies		Differentiation Plans
<b>Process Choices</b>		<ol style="list-style-type: none"> <li>1. <u>Different Grouping:</u> <ul style="list-style-type: none"> <li>• Students may choose to work alone or with one partner.</li> <li>• As needed, some students with I.E.P.'s may work with a small group of three or four students as the Special Education teacher feels is appropriate.</li> </ul> </li> <li>2. <u>Different Interests:</u> <ul style="list-style-type: none"> <li>• Students may choose their own topic ☺ !!!</li> </ul> </li> <li>3. <u>Different Learning Rates:</u> <ul style="list-style-type: none"> <li>• Although students are given target dates to accomplish each task, there is no penalty for 'being late' as long as the student communicates the progress and the reason(s) extensions are needed.</li> <li>• Students who have participated in science fair in the past, or who simply grasp tasks quickly are free to work ahead at their own pace.</li> </ul> </li> <li>4. <u>Different Audiences:</u> <ul style="list-style-type: none"> <li>• Although all students prepare their projects for the community K-12 Waterloo District Science Fair, some students are targeting the audience of spectators and judges at the regional and state level of competition, too!</li> </ul> </li> <li>5. <u>Different Places:</u> <ul style="list-style-type: none"> <li>• Science classroom</li> <li>• School library</li> <li>• Computer lab</li> <li>• School, home, local business, or laboratory to conduct the experiment</li> </ul> </li> </ol>
X	Different levels of learning (Bloom's)	
X	Different interests	
	Learning styles (multiple intelligences)	
X	Different learning rates	
	Different questioning	
X	Different audiences, mentors, community involvement	
X	Different places	

<b>Product Choices</b>		<p>All students are required to complete a final, typed science fair project paper and display board in accordance with the Illinois Junior Academy of Science Policy Manual. In this sense, all final products are “the same”.</p> <p>However, because students select their own topic and design their own experiments, there are significantly different levels of difficulty and a wide variety of quality in the final products. Some students work toward simply meeting classroom requirements, while other students hope to qualify for participation at the Regional Science Fair and perhaps the State.</p>
	Variety of ways to “show what you know”	
X	Using different levels of difficulty	
X	Quality	
<b>Content Choices</b>		<p><u>Teacher identified resources:</u> science text, IJAS web site, IJAS Policy Manual</p>
X	Resources	<p><u>Student identified resources:</u> students select their own resources for Review of Literature including books, journal articles, online references, personal interviews. Since materials are self-selected there is a wide variety of reading levels and most are appropriate to the student.</p> <p><u>Technology:</u> all students will utilize the Internet, Word, and Excel and other technology applications will vary with the individual projects selected</p>
X	Multiple reading levels (& math, etc.)	
X	Technology	
X	Individual and groups	
	Other	
<b>Extensions</b>		<p><u>Challenge:</u> students with special interest and/or ability in the Language Arts and/or science are encouraged to double or triple the number of references used in preparing the Review of Literature. Students who hope to qualify for State are encouraged to utilize 10 to 15 references. Students with a special interest and/or ability in math are encouraged to far exceed the minimum number of trials in their experiments to produce more reliable data. They are expected to conduct statistical analysis which may include standard deviation and percent experimental error.</p>
X	Challenges/ Acceleration/ Enrichment	<p><u>Modifications:</u> accommodations are made for IEP students depending on their needs. For example, while most students must use a minimum of five references for their Review of Literature, IEP students with difficulty in Language Arts may be asked to only utilize three references.</p>
X	Modifications	

Template format adapted from Rockwood Gifted Program