Student Name: ___________________________
Title: Individual Research Project
Year & Course: Year 8 Science
Date issued: 29/01/2016 (Friday Week 1, Term 1)
Proposal due: 05/02/2016 (Friday Week 2, Term 1)
Final Report due: 23/02/2016 (Tuesday Week 5, Term 1)
Assessment value: 25%

Task Details
This Research project requires YOU to investigate a problem. It may be a problem of your own choice or one from the list pages provided by your teacher. You will have to do most of your project at home and your teacher will assist you at school.

A small amount of class time will be spent completing your topic, as well as learning how to carry out research and actually doing your project.

See below for specific details

Outcomes Being Assessed:

<table>
<thead>
<tr>
<th>Outcomes Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appreciates the importance of science in their lives and the role of scientific enquiry in increasing understanding of the world around them</td>
</tr>
<tr>
<td>Identifies questions and problems that can be tested or researched and makes predictions based on the scientific knowledge</td>
</tr>
<tr>
<td>Presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations.</td>
</tr>
</tbody>
</table>

This assessment task should be given to your teacher on the due date in class

If you are late you must:
1. Inform your teacher.
2. Get a misadventure form from the Head Teacher.
3. For Years 7-9 complete all paper work and obtain note from your parent/caregiver.

Late assessment tasks receive a ZERO score
Specific Instructions/Requirements:

The investigation and reporting process

- Use the scaffold and marking criteria for extra assistance in each area.

1) **Choosing an aim:** Identify a problem.
2) **State your hypothesis:** Make a single sentence statement that can be tested.
3) **Identify the risks involved:** Make sure these risks are towards humans.
4) **Identify the variables involved:** Independent, Dependent and ones to be kept the same.
5) **Method:** Write a list of materials. State your method in a step by step manner so that your younger brother or sister could read your instructions and carry out your experiment.
6) **Draw a scientific diagram:** of how you will conduct your experiment.
7) **Record the results:** Write observations, construct and use tables and graphs.
   
   *NB: If your experiment does not allow you to graph your data then you need to rethink the design of your experiment in order to gain full marks.*
8) **Discussion:**
   - Was your hypothesis supported by the results of your experiment?
   - Link your findings with background research and your experiences in conducting the experiment.
   - Discuss relationships, patterns and trends in data/ results
   - Identify any limitations or sources of error in your experiment.
   - Identify any improvements or modifications you think need to be made to the experimental method in the future or suggest other avenues to investigate.
9) **Conclusion:** A simple statement that responds to your aim in a few short single sentences.
10) **Submit your final project.**

**Checklist to help complete the assignment**

<table>
<thead>
<tr>
<th>Time to be completed around</th>
<th>Task</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal</td>
<td>Choose your topic and think about your aim.</td>
<td></td>
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<tr>
<td></td>
<td>Identify your variables</td>
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<tr>
<td></td>
<td>List required equipment.</td>
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<tr>
<td></td>
<td>Design your experiment.</td>
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<td></td>
<td>Identify areas where safety could be an issue within your experiment</td>
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<tr>
<td></td>
<td>Discuss your project with your teacher.</td>
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<td></td>
<td>→ Resubmit your proposal if requested by your teacher</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refine your experimental method (if needed) and discuss with your teacher</td>
<td></td>
</tr>
<tr>
<td>Final report</td>
<td>Organise your required equipment</td>
<td></td>
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<tr>
<td></td>
<td>Conduct your initial experiments.</td>
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<td></td>
<td>Analyse your results and refine your experiment if necessary.</td>
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<tr>
<td></td>
<td>Continue and / or repeat your experiment.</td>
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<tr>
<td></td>
<td>Analyse your final results.</td>
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</tr>
<tr>
<td></td>
<td>Calculate sources of error e.g. sample size &amp; selection, measurements, poor control of variables, etc.</td>
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<tr>
<td></td>
<td>Discuss your results with your teacher.</td>
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<td></td>
<td>Write up your report.</td>
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<td></td>
<td>Discuss your draft report with teacher and edit it as needed.</td>
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<tr>
<td></td>
<td>Submit final report</td>
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</tbody>
</table>
Helpful Hints

Choose a topic
- Pick something you are interested in and you have the resources to complete the project. Look in library books/magazines for ideas.
- Ask for help from your teachers.
- Think carefully to decide if your idea can be completed in the time allocated. Can it be investigated by experiment? Can you get and afford the materials you need?
- Perhaps the most difficult part of the Research project for some of you, is deciding on what to do. See the list of suggestions posted outside the Science staffroom that may help you think creatively.

Plan your Research Project
- Write down exactly what you are trying to find out. Begin your project by writing down your ideas in a notebook.
- Think of ways you could test your ideas (try to keep your experiments simple).
- Plan your procedures (try to use flowcharts)
- Draw some diagrams
- Keep things in logical order
- Think of better ways. Improve older inventions by modification
- Think of new or other uses for things that have already been invented.
- Use and develop things from ideas found in nature e.g. Velcro

Carry out your investigation
- Keep careful notes of what you have done. Put your notes straight into your project journal/logbook/diary so they are not lost.
- make use of throwaway things
  - cotton reels
  - bottles/jars
  - boxes/cartons
  - tyres
  - cans
  - plastic/paper/foil
- Use tables, photographs, graphs wherever you can.
- Record your successes and failures – you often learn more from your failures.
- Realise you may not always get the answer you expect.
- After each experiment, ask ‘What if ……..’ then try it.
- Make sure you do each component of the experiment more than once to obtain repeatable results.
- Be prepared to change your ideas as you get results from your experiments.

Write a report
- Tell others what you have found out.
- Make sure your report is easy to read and understand. You must also submit your project journal/logbook/diary as part of your report.
**Some ideas for your Project**

- What is the average size of soap bottles?
- Which brand of pen lasts the longest?
- How much writing can be done by one pen? Compare it with others!
- Which glue sticks best?
- Which toilet paper is the strongest?
- Do all iron objects rust at the same time?
- Are all the pea seeds in a pod the same size?
- Is there a relationship between types of paper and their strength?
- Do all papers of the same type have the same strength?
- Is paper from a recycled source as strong as paper in its first use?
- Do seeds of the same type germinate at the same rate?
- Which coins are most affected by standing in vinegar?
- Will Coca Cola really rot teeth (simulation marble chips)?
- Does the moon rise in the same place every night?
- Which metal corrodes more quickly in water?
- Which battery lasts the longest?
- Which detergent makes the most suds?
- Which pens can write on all surfaces?
- Which pens will write upside down?
- What is the least amount of salt that will prevent 100ml of water from freezing?
- What brand of cricket ball is most durable?
- Which hair rinse colour lasts the longest?
- How does lantana grow so well not allow native plants to grow in its area?
- Why does the sea not dry out completely?
- How are people’s fingerprints different?
- Which detergent is the most effective at removing stains?
- Which colour balloons blow up the biggest?
- Which substances dissolve quickly in water.
- Which brands of chips match their actual mass with the stated mass?
- Which twigs from different species of tree burn the fastest or longest?
- Which stain removers are most effective at removing common stains?
- Does the price paid for paper towel reflect its quality?
- Compare the frequencies of male and female voices
- Which brand of nappies can absorb the most moisture in a controlled setting?
- To examine the effect of different forms of damage to a CD on its ability to be read by a computer
- Which brand of batteries lasts the longest in an MP3 player
- To test the keep qualities of different types of food
- To test whether microwaving fruits decreases their weight
PROPOSAL

Experiment topic idea: ____________________________________________

Aim of experiment:
________________________________________________________________________
________________________________________________________________________

Rational: Why did you choose this experiment?
________________________________________________________________________
________________________________________________________________________

Identify your variables:

Independent Variable (the one you are going to change):
________________________________________________________________________

Dependent variable (the one you are going to measure):
________________________________________________________________________

Other variables to be kept the same: (at least three)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Equipment list:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Basic method (Include time required to do the experiment and repeated trials):
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Safety aspects to your experiment:
________________________________________________________________________
________________________________________________________________________

Is there anything that you want help with?
________________________________________________________________________
**Experimental Research Project – Assignment Template**

**Title:** ____________________________________________

**Aim:** (What you are trying to find out, be specific)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

**Hypothesis:** (Educated guess, clearly stated)
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

**Risk Assessment:**

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Risk</th>
<th>Control</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>What is it?</em></td>
<td><em>What could happen?</em></td>
<td><em>How will you keep it safe?</em> (preventative measures)</td>
<td><em>What should you do if it happens?</em></td>
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</tr>
</tbody>
</table>

Identify variables (independent, dependent, and the ones you keep the same)

- Independent
  __________________________________________________________
- Dependent
  __________________________________________________________
- Ones to keep the same
  __________________________________________________________
  [List at least 3] ____________________________________________

________________________________________________________________________
________________________________________________________________________
Method:

Equipment: (Remember quantities)

- __________________________  
- __________________________  
- __________________________  
- __________________________  
- __________________________  
- __________________________

Step by step procedure: (past tense, logical order (includes adequate timeframe), quantities included, repeated trials included, your analysis of results included)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
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________________________________________________________________________

Scientific Diagram:
Results:

Observations:

________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________
________________________________________________________________________________________

Table: (includes all data and an average)
Graph: (averages graphed only)
Discussion:

Was your hypothesis supported by the results of your experiment?

________________________________________________________________________________________________________________________

Link your findings with background research and your experiences in conducting the experiment.

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

Discuss relationships, patterns and trends in data/results

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

Identify any limitations or sources of error in your experiment.

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

Identify any improvements or modifications you think need to be made to the experimental method in the future or suggest other avenues to investigate.

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

Conclusion: (brief statement that summarises how the experimental results support or contradict the aim of the experiment. Any other relevant questions can be answered here)

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________

________________________________________________________________________________________________________________________
### Marking Criteria:

<table>
<thead>
<tr>
<th></th>
<th>Not included</th>
<th>Limited (Needs work)</th>
<th>Basic (Okay)</th>
<th>Sound (Satisfactory)</th>
<th>High (Has depth)</th>
<th>Outstanding (Goes beyond expectations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposal</td>
<td>0</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>2.5</td>
<td>3</td>
</tr>
<tr>
<td>Title - appropriate and relevant</td>
<td>0</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aim - identify problem, correct format and wording</td>
<td>0</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothesis - clearly stated, correct wording</td>
<td>0</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk assessment - identify and manage two hazards</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Variables - variables &amp; at least 3 kept the same</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Method - equipment listed &amp; quantities required - procedure correctly written &amp; given suggestions</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Scientific Diagram - drawn in pencil &amp; labelled</td>
<td>0</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Results - Observations written</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Discussion - addresses results and explains answer using prompted questions</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Conclusion - appropriate to aim</td>
<td>0</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>2.5</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL /53</strong></td>
<td><strong>0</strong></td>
<td><strong>1</strong></td>
<td><strong>1.5</strong></td>
<td><strong>2</strong></td>
<td><strong>2.5</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>

### Science – Course Performance Descriptors

<table>
<thead>
<tr>
<th>Areas for Assessment</th>
<th>Limited</th>
<th>Basic</th>
<th>Sound</th>
<th>High</th>
<th>Outstanding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowing and understanding - models, theories and laws</td>
<td>identifies some scientific models, theories and laws, and recalls some processes that can be used to test them.</td>
<td>recalls scientific models, theories and laws to outline scientific phenomena, and identifies the processes that are used to test them.</td>
<td>relates models, theories and laws to scientific phenomena, and outlines the processes that are used to test and validate them.</td>
<td>describes scientific phenomena using models, theories and laws, and outlines the processes that are used to test and validate them.</td>
<td>explains scientific phenomena using models, theories and laws, and describes the processes that are used to test and validate them.</td>
</tr>
<tr>
<td>Planning and conducting investigations</td>
<td>with guidance, individually and in teams, plans and undertakes elementary first-hand investigations and draws simple conclusions from selected data.</td>
<td>individually and in teams, develops elementary plans, and undertakes first-hand investigations and, with guidance, draws relevant conclusions from selected data.</td>
<td>independently and in teams, uses identified strategies and problem-solving skills to plan and conduct first-hand investigations and draw relevant conclusions from the data collected.</td>
<td>independently and in teams, selects strategies and problem-solving skills to plan and conduct first-hand investigations, gather and process data, and draw valid conclusions.</td>
<td>engages, independently and in teams, in creative problem-solving processes to plan and conduct first-hand investigations, gather and process data, and draw valid conclusions.</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>with guidance, locates information from provided resources to identify simple trends, patterns and relationships.</td>
<td>locates and extracts information from provided resources to outline trends, patterns and relationships.</td>
<td>independently locates and summarises information from a variety of sources to describe trends, patterns and relationships.</td>
<td>independently locates and processes information from a variety of sources to explain trends, patterns and relationships.</td>
<td>independently locates and processes information from a wide variety of sources to explain trends, patterns and relationships.</td>
</tr>
<tr>
<td>Communicating</td>
<td>with guidance, communicates information to an audience.</td>
<td>communicates their scientific understanding to an audience.</td>
<td>selects a suitable way to communicate their scientific understanding to an audience.</td>
<td>selects suitable ways to communicate their scientific understanding to an audience.</td>
<td>communicates their scientific findings, understanding and viewpoints in a variety of ways to an audience.</td>
</tr>
</tbody>
</table>
### Woonona High School

<table>
<thead>
<tr>
<th>STUDENT NAME</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SUBJECT/COURSE</td>
<td>8 Science</td>
</tr>
<tr>
<td>ASSESSMENT TASK TITLE</td>
<td>Individual Research Project</td>
</tr>
<tr>
<td>DATE DUE</td>
<td>23/02/2016 (Tuesday Week 5, Term 1)</td>
</tr>
<tr>
<td>DATE SUBMITTED</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Self Reflection and Future Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>(When possible, complete before submitting the task and again after feedback from teacher)</td>
</tr>
</tbody>
</table>

#### Positives in performance
Comment:

#### Gaps in performance
Comment:

#### Strategies for further improvements
Comment:

This assessment task has been prepared by me in accordance with the school assessment guidelines and is my own work.

Student Signature

Date

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The teacher will give you this receipt when the assessment task is submitted. The student must keep this receipt as evidence of having submitted the assessment task.