



YEAR 12 Senior Science

Information Technology

Due Date: Friday 8 th June	Assessment Name: A Comparison of AM and FM radio signals
Mark: /66	Weighting: 25 %

SYLLABUS OUTCOMES TO BE ASSESSED:

H10 **Discusses** ways in which different forms of energy and energy transfers and transformations are used.

H11 **Justifies** the appropriateness of a particular investigation plan

H12 **Evaluates** ways in which accuracy and reliability could be improved in an investigation

H13 Uses terminology and reporting styles appropriately and successfully to **communicate** information and understanding

H14 **Assesses** the validity of conclusions from gathered data and information

DIRECTIVES TO BE ASSESSED:

Identify: Recognise and name

Discuss: Identify issues and provide points for and against

Justify: Support an argument or a conclusion

Evaluate: Make a judgement based on criteria

Assess: Make a judgement of value, quality, outcomes or results

○ **TASK DESCRIPTION:**

○ You are required to:

○ Plan, choose equipment or resources for, and perform a first hand investigation to compare communication using AM and FM radio waves. Do this under at least two conditions that would affect the reception of radio signals (e.g. near hilly terrain, under powerlines, in a carpark).

1. You have access to AM and FM radio waves through a radio receiver. State the name and frequencies of stations used in your investigation report.

2. Record the quality of AM reception compared to FM reception. Describe the criteria used to assess quality (volume, clarity of signal, interference/noise)

3. **Assess** the quality of the AM and FM signals and relate these to the properties of those waves.

4. **Identify** variables that need to be controlled and explain how this was accomplished or accounted for.

○ Present your results in the correct scientific report format (see attached)

ASSESSMENT CRITERIA – STUDENT CHECKLIST:

You will be assessed on your ability to:

○ Plan and carry out a controlled, reliable and accurate scientific investigation

○ **Communicate** data and conclusions appropriately in the correct scientific report format.

Scientific reports include a descriptive title, an Introduction, Hypothesis, Aim, Materials, Method, Results (including graphs, tables and observations), Discussion, Conclusion and References.

○ Remember to test two conditions that may effect radio reception.

○ Record quantitative data. You may have to create a marking scale (1=good reception, 2= average reception, etc)

○ Indicate how you attempted to control variables

○ **Assess** the accuracy of your results by comparing them with results that other people have reported for similar investigations.

MARKING GUIDELINES

Guideline	Mark
<p>H10 Discusses ways in which different forms of energy and energy transfers and transformations are used.</p> <p>H13 Uses terminology and reporting styles appropriately and successfully communicate information and understanding by including:</p> <ul style="list-style-type: none"> - Title – title is descriptive 1 - Introduction: <ul style="list-style-type: none"> o Include a statement of the problem you are investigating 2 o Discusses features of AM and FM waves (such as how the carrier wave is modulated to carry information) 2 o Describe properties of AM and FM that limit the use of each form 2 o Discuss why AM and FM waves are suited to their roles in communication 2 - Materials <ul style="list-style-type: none"> o Listed 1 o Quantities 1 - Method <ul style="list-style-type: none"> o Clear statement of what is being measured 2 o Method is easily followed 2 o Chronological steps 2 o Written using third person passive voice 2 o Diagram/description/photo of how to set up equipment (diagram is labelled, pencil, with a ruler, photo captioned) 2 o Two conditions that may effect AM and FM waves are tested 2 o Identify variables and indicate how they are controlled 2 - Results <ul style="list-style-type: none"> o Observations and measurements 2 o Quantatative data included 2 o Tables and graphs are relevant and appropriate (Headings, set out properly, lines drawn appropriately) 4 o Tables and graphs are correctly labelled 2 	
<p>H11 Justifies the appropriateness of a particular investigation plan by including:</p> <ul style="list-style-type: none"> - Discussion <ul style="list-style-type: none"> o Statement of what the results demonstrate 2 o Explanation of how the results may be useful 2 <p>H12 Evaluates ways in which accuracy and reliability could be improved in an investigation by including:</p> <ul style="list-style-type: none"> o An Identification of weaknesses/difficulties in your experimental design 1 o A Description of these weaknesses/difficulties 2 o An Explanation of how these weaknesses/difficulties affect the accuracy and reliability of your results. 2 o An Evaluation of how the accuracy of your results could be improved. (Refer to other literature sources). 2 o An Evaluation of how the reliability of your results could be improved. (Refer to other literature sources). 2 	
<p>H14 Assesses the validity of conclusions from gathered data and information by including:</p> <ul style="list-style-type: none"> - Conclusions 2 <ul style="list-style-type: none"> o Relates results back to hypothesis. 2 o Identifies areas that effectively test the hypothesis and areas that were less effective (validity). 3 o Explains the areas identified above. 4 o Assesses how big an effect these areas had on the validity of the investigation. 4 	
<p>H13 Uses terminology and reporting styles appropriately and successfully communicate information and understanding by including:</p> <ul style="list-style-type: none"> o Bibliography showing secondary sources used – at least 3 sources listed 2 o Correct headings for sections within the report 1 o A logical sequence in presenting the report 1 o A table of contents or page numbers 1 	
Total	66

Writing your report

Your final report cannot be completed until you have all your results. You can, however, start to get it together earlier. It should be typed or neatly written on A4 paper (standard sized paper). It should begin with a **Table of contents**, and all **pages should be numbered**. Your report should include the following –

1. **Introduction:** -

- Present all relevant background information. Include things like information about the nature of AM FM waves, their strengths and weaknesses and their applications. You need to include information that you have found from secondary sources, while researching your experiment. Include a description of factors that impact the quality of reception.

2. **Hypothesis:**

- Make a prediction about the outcome of the experiment. Your hypothesis forms the basis of your test.

3. **Aim:**

- Briefly state the purpose of your investigation.

4. **Materials and method:-**

- Begin with a list of the materials you used in carrying out your investigation.
- Describe how you carried out your experiment. It should be clearly written so that another person could repeat your experiment. Make it clear which things are the variables you have controlled in your experiment.
- Label all diagrams clearly.
- Write your method chronologically in an appropriate format.

5. **Results**

- Observations and measurements are recorded here.
- Where possible, present data in tables and graphs. Ensure the tables and graphs are clearly labelled and titled.

6. **Discussion**

- Discuss your results here.
- Begin with a statement of what your results demonstrate.
- Link your results back to research included in the Introduction. Are your findings correct?
- Assess validity and reliability. Talk about any weaknesses in your design or difficulties that you had with your investigation.
- Explain how you could have improved your experiment.

7. **Conclusion**

- This is a brief statement about what you found out. It should be based on your hypothesis and report what you found out about the hypothesis.
- If you did not achieve your aim say so, you will not lose marks if your experiment did not work the way you thought it would, provided you have done everything correctly.
- State if your hypothesis is accepted or rejected

Remember – you have to investigate 2 conditions that may effect radio reception/strength etc of AM/FM radio