

**St Joseph's RC Comprehensive Physics Dept.**  
**Advancing Physics A2 for Sept 2001**  
**Module 2863 Component 02: Practical Investigation**  
**Module 2864 Component 02: Research Report**

### Introduction

There are TWO coursework tasks for A2.

1. A Practical Investigation
2. A Research Report

Each one counts for **7.5%** of your A level in physics.

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### The following staff expertise is available to you:

Mr I.C. Robinson and Mr D. Shearer both come from a heavy engineering background. They have worked all over the world on coal, oil and nuclear power station plant up to 800MW electrical output and at steel works, oil refineries and other industrial plant.

They worked for NEI Parsons (now Siemens Power Generation Group) before coming in to teaching.

Their particular area of expertise is modal balancing and solution of vibration problems on the turbine generator rotor and stator systems.

Mr Robinson is a chartered electrical engineer with a particular interest in Particle Physics and Mr Shearer studied for an MSc in Tribology (the study of surfaces in relative motion i.e. lubrication, friction, wear) and has become interested in Medical Physics since teaching A level.

Mr M. Obee has expertise in chemical and pharmaceutical engineering and has worked in Texas, for Nissan and at a call centre. Since joining us he has taken special interest in the Materials section at A level. All staff have wide experience of the real world!

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## Module 2863 Component 02: Practical Investigation

### Overview

- You will investigate of a practical problem related to physics or its applications.
- It is anticipated that you will use a wide variety of experiments and techniques in this extended investigation.
- The most suitable topic is a clearly defined problem, which offers scope for genuine investigation, rather than routine, mechanical and unimaginative work.
- The topic should give you the opportunity to use physics at an Advanced GCE standard and provides an opportunity for you to demonstrate your experimental and investigative skills.

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### What are the aims?

- You should understand where ideas come from, how they make sense, how they may be used.
- An ability to investigate an unfamiliar situation in a sensible and scientific way is useful in tackling practical problems in everyday life.
- The outcome of the task is a written report which describes the process of the investigation and discusses the conclusions which may be drawn from the practical work done.

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### Managing the Practical Investigation

The time allocated to this task is **ten hours of teaching time** and an **equivalent amount of time in research and writing up the report**.

1. To begin you choose an interesting topic for investigation **and carry out some preliminary research** – analysing the topic, getting 'a feel' for the relevant factors, considering the selection of appropriate apparatus and measuring techniques, **carry out a literature search**, if appropriate – with a view to **deciding upon an experimental design** which will allow the first set(s) of readings to be taken.
2. The next stages are to carry out the Investigation in the laboratory, to **write-up** the findings of the experimental work, in the form of a **daily diary**, and then to **submit the finished report** to the teacher for assessment.
3. The assessment will be based on observation of the work done, and on discussion with you, as well as information revealed in the written report.

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### Opportunities for the assessment of Key Skills in this Component

This task presents an ideal opportunity for you to provide evidence that you have reached the required standard in many aspects of key skills.

#### Communication

**C3.3** The Investigation has as the outcome a written document about a complex subject. Candidates are expected to include images where relevant.

#### Application of Number

The Investigation provides an opportunity for candidates to:

**N3.1** collect and interpret a set of data from an experiment;

**N3.2** carry out calculations on the data, using formulae, taking into account the accuracy of the data.

**N3.3** The candidate is then required to interpret the results of the calculations and present their findings in a written report.

#### IT

**IT3.2** Candidates have the opportunity to use IT to bring together the information collected during their investigation and develop it for their report.

**IT3.3** Candidates need to make a written report, which includes some images, text and numbers.

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**Possible Practical Investigation Titles (not restrictive)**

This list was compiled from revised Nuffield suggestions and CAPT:

1. Creep in copper wire
2. Paper strength
3. Hot wire wind speed meter
4. Diffusion of tea through tea bags
5. Measuring paper thickness
6. Formation of sand dunes
7. Effect of oil on evaporation of liquids
8. Resonance of wine glasses
9. Fabric properties
10. Strength of hair
11. Shapes and oscillations of soap bubbles
12. Oscillations and deflection of model suspension bridge
13. Damping of oscillations in liquids
14. Investigation of sails
15. High velocity impacts in sand
16. Properties of liquid droplets on a hot plate
17. Behaviour of copper wires at different temperatures
18. Behaviour of blutac
19. Flight properties of a shuttlecock
20. Fringes in draining soap films
21. Properties of foam plastic
22. Oscillations of wire rings
23. Behaviour of bubbles rising in liquids
24. Aerials
25. Efficiency of a catapult
26. Behaviour of a cantilever
27. Behaviour of rubber bands at different temperatures
28. Absorption of electromagnetic waves by glass
29. Thermocouples using different metal junctions
30. Effect of salt and sawdust on the strength of ice
31. Electromagnetic flowmeter
32. Factors affecting refractive index of liquids
33. Currents induced in ionic solutions moving through a magnetic field
34. Properties of a paste of flour and water (or custard powder and water!)
35. Stability of slopes
36. Rocket propulsion
37. Energy lost in collisions
38. Fluid viscosity
39. Araldite bonds (or Comparing the strength of different glues)
40. Thickness of paint
41. Parachutes
42. Reaction time of thermistors
43. Factors affecting flight of darts
44. Transmission of light through water
45. Catamaran sail design
46. Viscous flow of golden syrup
47. Quantifying the frictional drag on a PASCO dynamics trolley.
48. Coupled pendulums.
49. What is the optimal position for a guitar pick up?
50. Damped SHM of PASCO trolley between two springs.
51. Can the standing waves on a stretched wire be used to measure its change in diameter when under load?
52. Refractive index of ionic solutions.
53. Viscosity of syrup and slowly moving jars (when you do Chapter 14 you'll recognise this!)

54. Measuring speed using interference fringes.
55. The I V characteristics of a planar diode.
56. Electrical conductance of flames.
57. How can the hardness of blutac be measured?
58. Oscillating LC circuits.
59. How do colliding metal bars bounce?
60. What is the optimal size for a hole in pin hole camera?
61. Does hair conditioner make any difference?
62. How does sand fall from an hour glass?
63. The bounciness of a "rubber band" ball.
64. The viscosity of engine oils.
65. The effectiveness of reflective materials
66. Energy from waves
67. Electromagnetic flowmeters
68. Sedimentation
69. The flight of shuttlecocks
70. Electromagnetic braking
71. Stability of slopes
72. Vortices in fluids
73. Heat exchangers
74. Why do flags flap?
75. The physics of squash balls
76. Stability of high-sided vehicles in cross-winds
77. The acoustic properties of double-glazing
78. Crash barriers
79. Ski jumps
80. River meanders - a question of chance?
81. Corona discharge
82. Piezoelectric effect
83. Behaviour of water drops on hot plates
84. Defects in a reed and their effects (uses Cool Edit)
85. The Human Voice
86. Ski Jumps
87. Optimising a water mill's output.
88. Windmills
89. Newtons law of Cooling – When does it break down?
90. Behaviour of a gyroscope
91. Damping effects of SHM
92. Physics of snooker
93. Wind speed and angle of attack of an aerofoil.
94. Characteristics of golf balls
95. Evaporation of water affected by soap solutions

N.B. 66 onwards are from OCR advice or AP Newsletter.

There is some further guidance for both teachers and students on the A2 CD-ROM.

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**Suggested Headings for Report**

*Safety of personnel and equipment is, as ever your No. 1 priority and should be given due mention.*

*The final write up must come from your Journal which will detail what happened every time you did some work on the investigation - allow time to write this AS IT HAPPENS - at the end of each session.*

*Include results, instruments, calibrations, even thoughts - which may be important later. It should be word processed and use spreadsheets for graphing and analysis.*

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**Aim**

The investigation simply stated and explained

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**Abstract**

Brief summary of the whole investigation - as it would appear if a short news item was done on your work.

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**Introduction**

Explain the physics involved - include images/diagrams

Describe the experiment as it developed - include any "blind alleys" or "false starts"

List the variables involved and those you decide to investigate.

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**Plan**

A detailed plan based on your abstract, introduction and any preliminary work.

A list of apparatus with ranges, references and characteristics.

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**Results**

Final results to be discussed.

Include range and precision of equipment

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**Discussion**

Graphs and any conclusions you make - even if tentative.

Error bars on graph points if appropriate.

Draw together your results from the journal and discuss possible outcomes.

What steps you took to minimise uncertainties in your equipment and readings.

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**Evaluation**

Problems you had with the investigation, how you overcame them.

How "good", reliable your conclusions are.

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**Conclusions**

What you found out - concise, use bullet point or numbered list - relate to pages or dates or graphs you have drawn.

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**References**

Include texts, web addresses any print outs you have generated (but not a forest full!)

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## Module 2864 Component 02: Research Report

You must produce an individual written report on a topic of physics of your own choosing. The work is expected to be exploratory, with the aim of collecting and analysing information about an issue in which a range of physics ideas are significant.

You must also consider some aspect of the wider context of the physics, considering social, historical, economic, or environmental issues.

### Aims

Assess your ability to:

1. Find information from a variety of sources
2. Compare and analyse information obtained
3. Use this material to discuss an issue and draw conclusions
4. Bring together ideas from different parts of the subject in a synoptic (summary of the whole course) way.

The Research Report gives you an opportunity to display, and be rewarded for, the skills you have developed during the course.

The assessment rewards such skills as:

- working independently;
- drawing together ideas from different aspects of physics;
- selecting and extracting information from a variety of sources;
- applying knowledge and understanding of basic ideas
- translating and interpreting information
- placing the physics ideas in a wider human or social context
- communicating scientific ideas in continuous prose using good English.
- using published material as part of research.

You must do your own research from a range and variety of sources:

- books
- journals
- pamphlets
- surveys
- interviews
- libraries
- data bases
- visits
- web sites on the Internet.

The outcome is a individual written report on a topic of physics of your own choosing.

**The exact topic must be approved, in advance by the class teacher.**

The teacher should ensure that the candidate chooses a topic which will enable them to demonstrate their skills in drawing together a variety of physics ideas.

**The report should be between 2000 and 4000 words (about 10 pages - plus any images which are expected)**

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## Managing the task

1. To begin choose a suitable topic for research and then spend some time collecting relevant information from a range of sources.
2. Locate and consult a range of source material in order to obtain a sample of the information available.
3. This initial phase of the research may be spread over several weeks, and is carried out in your own time.
4. Staff will monitor the candidate during the project and are willing to offer tactful advice at any stage during the work, so that you become fully aware of how to maximise your performance.
5. If help is asked for it will be given, as far as possible, in a way which allows you to gain credit for using such advice in their own way.
6. The next stage is to select an interesting aspect /issue/ application/ problem which has arisen from the material surveyed and to research it more thoroughly.
7. Then summarise the findings of the research in the form of a written report or article addressed to scientifically knowledgeable readers.
8. You should use word-processing and other IT packages.
9. The time allocated for making sense of the information collected (*analysis*) and for writing the scientific article (*communication*) is about 10 hours of 'physics teaching' and the equivalent amount of 'homework' time.
10. All information sources consulted must be listed and published material used should be given full references.

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## Assessing the Research Report

This task provides an opportunity for you to demonstrate your research, analysis and communication skills.

At this level, in A2, you are expected to be able to draw together ideas from different parts of physics, to synthesise their ideas and place the physics in a wider context.

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## Opportunities for the assessment of Key Skills in this Component

The *Research Report* present an ideal opportunity for candidates to provide evidence that they have reached the required standard in many aspects of the key skills.

### Communication

**C3.2:** To carry out the research candidates need to read at least two extended documents and draw together the ideas there.

**C3.3:** The outcome for this task is a written document about a complex subject. Candidates are expected to include images.

### Application of Number

**N3.2:** Depending on their choice of topic candidates may collect and interpret a set of data; carry out calculations on the data, using formulae, taking into account the accuracy of the data.

**N3.3:** The candidate will interpret the results of the calculations and present their findings in a written report.

### IT

**IT3:** In preparing for the Research report candidates have an opportunity to carry out a substantial activity which provides evidence for all or some of the aspects.

**IT3.1:** They need to carry out research in a variety of ways which may include using CD-ROMs, databases and the Internet.

**IT3.2:** They may need to bring the information together and develop it for their presentation.

**IT3.3:** Candidates need to make a written report, which may include some images, text and numbers.

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## **Suggested Headings for Research Report**

**These are just a guide feel free to add any extra ones.**

### **Title**

The overall title of your research.

### **Aim**

What you were researching, and why.

### **Introduction**

Give a summary of your background research to decide on the project

### **Contents**

List of contents of numbered sections of your report.

### **Title**

Again as you are now in the body of the report...

This is the main section, split into a logical set of sub-headings (numbers referenced to the title page)

This will be specific to your work.

Include numbered references in the report.

### **Bibliography**

Numbered list, to include texts, web addresses, private communications etc.

### **Acknowledgements**

If anyone gave you specific help of great value.

### **Marks Awarded**

“Best Fit” approach is used to assign these marks;

**1 Mark: meets only the simplest demands of the task**

**3 Marks: meets a reasonable proportion of the significant demands of the task competently**

**5 Marks: shows wide ranging skill and competence in meeting most demands of the task**

Intermediate marks (2, 4) are possible.

The assessment criteria for each task are listed at the end of this document.

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**Possible titles for the Research Report**

These are only suggestions and you are NOT restricted to them BUT PICK SOMETHING YOU ARE INTERESTED IN...

The Case Studies (A2 Text p.229 on) may generate some ideas.

1. Hybrid Vehicles
2. Batteries
3. Wave energy
4. Geothermal energy
5. Nuclear Energy
6. Something to Do With Space or Satellites or GPS or Earth Resources
7. Something to do with Medical Physics – we have texts, resources and contacts.
8. Digital Music
9. Modelling in Science
10. Electric Motors
11. Radioactivity
12. Resonance in Use
13. Physics and Art
14. Physics and Sport
15. Physics and (specific) Material
16. Physics and Medicine
17. Vehicle Safety
18. Tyre Design
19. Suspension Design
20. Engine Design
21. Lubrication
22. Rocket Design
23. Supersonic Flight (or other flight related topic)
24. Physics and The PC
25. Telescopes
26. Physics and Television
27. Current Issues in Particle Physics
28. Physics and The Internet
29. Digital electronics and ECG monitors
30. Modern control technology in farm machinery
31. Speech synthesis and recognition
32. Guitar electronics
33. Human fitness monitoring
34. Methods for traffic control
35. Automatic flight control (fly by wire)
36. Artificial intelligence and neural networks
37. Robotics
38. CT Scanners (we have contact at STDH)
39. Electronic weather recording
40. Satellite communications
41. Autofocus systems in cameras
42. Our Sun, the largest fusion reactor in the Solar System - for how long?
43. What decides the surface temperature of planets?
44. Combined Heat and power, or Power from waste (we have a video)

**You will be assessed against these criteria for the Practical Investigation:**

<b>PRACTICAL INVESTIGATION 2863/02</b>				Centre No :			
A copy of this sheet must be attached to each candidate's work as a record of the assessment.				Candidate No :			
Candidate Name:				Candidate No :			
In iti at iv e a n d in de pe nd en ce:	<b>A</b>	<p><b>Problem:</b> There is clear analysis of the problem. Appropriate variables are selected for investigation. A thoughtful plan was constructed.</p> <p><b>Independence</b> Personal responsibility was taken for plans and decisions.</p>	<p>The definition of the problem is sound but lacks some detail.</p> <p>A reasonable plan was made.</p> <p>The student's own ideas are sound, and advice given was acted upon</p>	<p>The problem has been defined in simple terms.</p> <p>Some evidence of planning.</p> <p>Help and advice given were usually acted upon.</p>	<p><b>Use of resources:</b> To good effect; advice and sources were well used.</p> <p><b>Experimental design</b> Careful choice of equipment, methods and techniques</p> <p><b>Safety</b> Safety was given due regard.</p>	<p>Some resources put to good use</p> <p>Equipment, methods and techniques are adequate</p> <p>Some attempt is made to address safety</p>	<p>Required direction</p> <p>Simple apparatus used in a direct way</p> <p>Safety measures are somewhat basic</p>
U se of ph ys ic s	<b>B</b>	<p><b>In devising the strategy:</b> Knowledge of physics is used to inform decisions about the progress of the investigation</p> <p><b>Experiments</b> A good range of experiments, showing progression and development. The potential of the experimental work has been fulfilled.</p>	<p>Some knowledge of physics was used in planning but some work was empirical.</p> <p>A related set of experiments is used, or some aspects of one experiment are investigated. Some of the potential of the work has been developed.</p>	<p>The work was largely empirical</p> <p>Experimental work relates to the task, but is limited in certain important respects.</p>	<p><b>In executing experiments:</b> Practical knowledge and skill are put to good use</p> <p><b>Experimental design</b> There is evidence of experimental design.</p> <p><b>Effects:</b> Effects which might affect results are seen and dealt with.</p>	<p>Some practical skill is shown; the work is competent.</p> <p>There is some evidence of experimental design.</p> <p>Effects which might affect results are commented upon.</p>	<p>Apparatus used in a direct way</p> <p>Little knowledge of physics is brought to bear.</p> <p>Effects which might affect results are not considered.</p>
C o m m u ni c at io n	<b>C</b>	<p><b>Observations</b> Observations &amp; measurements made with appropriate precision</p> <p>The number and range of results are appropriate.</p> <p><b>Record of observations</b> The collection and recording of data are well organised.</p> <p><b>Uncertainties</b> The limitations on accuracy, are appreciated. Steps are taken to minimise uncertainties.</p>	<p>Observations are recorded clearly. The number and range of results are satisfactory.</p> <p>The collection and recording of data are satisfactorily achieved.</p> <p>Some steps are taken to minimise uncertainties.</p>	<p>Observations are those expected for the task, but may be lacking in detail, range or precision.</p> <p>Tables of results lack significant details.</p> <p>Little attempt has been made to reduce uncertainties.</p>	<p><b>Presentation:</b> The report is concise and presents results with impact and clarity.</p> <p><b>Graphs and tables:</b> Graphical plots are well-chosen, to display results effectively. Graphs and tables are correctly labelled.</p> <p><b>Use of English:</b> The quality of English is good.</p>	<p>Work is generally neat and orderly.</p> <p>Graphs are basic, neat and without distracting elements. Attempts are made to choose the most appropriate plots.</p> <p>The quality of English is adequate to express complex ideas clearly.</p>	<p>The report is essentially a summary of the work done.</p> <p>Tables and graphs are presented, perhaps without much comment.</p> <p>The quality of English is adequate to express simple ideas clearly.</p>

<b>PRACTICAL INVESTIGATION A2 2863/02</b>				Centre No :			
Candidate Name:				Candidate No :			
Evaluation and discussion	<b>D</b> (i) Evaluation  (ii) Conclusions	<p><b>Analysis</b> The results are well analysed, to reveal the underlying relationships.</p>	General trends in the data are established using appropriate techniques.	There is some attempt to identify trends in the data, but the analysis lacks depth.	<p><b>Critical thought</b> The work shows evidence of critical and connected thought.</p>	The work shows progression and development.	The progress of the task was not affected by the effects observed
		<p><b>Relationships</b> Relationships proposed are consistent with the evidence and supported by underlying principles.</p> <p><b>Discrepancies</b> Discrepancies or anomalies are dealt with. Error bars have been used effectively on graphs to reflect the uncertainties.</p> <p><b>Limitations of methods</b> The limitations of the experimental procedures used are fully appreciated</p>	Relationships proposed are consistent with the evidence.  Some discrepancies are commented upon.  The main limitations of the experimental procedures are appreciated	Expected relationships are assumed to be present though they may be unsupported by the evidence.  Discrepancies are largely ignored.  There is little awareness of the limitations of the experimental procedures used	<p><b>Physics</b> Qualitative results are interpreted with care and insight. Basic errors in physics are avoided.</p> <p><b>Conclusions</b> The uncertainties inherent in the data are reflected appropriately by the tentative nature of the conclusions.</p> <p>The work is interesting, achieving results new to the student.</p>	Results are given some physical interpretation, even if this reveals minor misunderstandings. There are few errors in basic physics.  Conclusions, though supported by the evidence, may not be qualified as necessary.	The work is largely empirical with little attempt to interpret the physics.  Conclusions, which may be qualitative, are limited and focus on the more obvious results.
				(i) /5	(ii) /5		
<b>RATING TOTAL</b>				<b>/40</b>			
Additional comments to support and explain ratings.							
Assessors signature :					Date :		

CW TSA1

## You will be assessed against these criteria for the Research Report:

<b>RESEARCH REPORT Side 1 2864/02</b>				Centre No :			
A copy of this sheet must be attached to each candidate's work as a record of the assessment.							
Candidate Name:				Candidate No :			
I n i t i a t i v e a n d i n d e p e n d e n c e :	<b>A</b>	<p><u>Scope</u> <b>The report as a whole is a sustained, interesting, worthwhile study.</b></p> <p><u>Variety</u> <b>The report covered relevant and varied physics, achieving results, some of which are new to the student.</b></p> <p><u>Independence</u> Personal responsibility was taken for decisions.</p>	<p>The topic has interest and potential, and some of this is developed</p> <p>Incorporates a variety of relevant physics.</p> <p>Some independent decisions have been made; help given acted on appropriately.</p>	<p>A definite topic has been chosen.</p> <p>Simple physical ideas are used from more than one area of the subject.</p> <p>Guidance was needed at all stages.</p>	<p><u>Use of resources:</u> A good range and variety of relevant sources are used.</p> <p><u>References</u> Sources are acknowledged appropriately in the report. It is made clear which sources provide which information</p>	<p>More than one relevant source of information is used. The sources complement each other.</p> <p>Some reference is given to the sources (e.g. publication information, web-site location, dates and places of interviews with named people).</p>	<p>At least one source of information is used. The information gained is relevant.</p> <p>The source is clearly identified.</p>
	<p>(i) Initiative and Independence</p> <p>(ii) Resources</p>			(i) /5	(ii) /5		
U s e o f p h y s i c s	<b>B</b>	<p><u>Ideas</u> Theories and arguments are logically introduced or developed.</p> <p><u>Variety</u> A significant understanding of a range of physics ideas.</p>	<p>Relevant theories, models or arguments are presented but without much comment.</p> <p>Recognition that a variety of physics ideas are involved.</p>	<p>Simple physics ideas presented.</p> <p>There is a variety of physics ideas, but at a simple level.</p>	<p><u>Analysis</u> There is good and clear analysis of information, and the conclusions drawn are clearly stated and linked to the evidence.</p> <p><u>Links</u> The links between the different aspects of physics are drawn out.</p>	<p>Data and information are presented directly.</p> <p>There is some attempt to explain ideas using a variety of physics ideas.</p>	<p>The report is entirely descriptive with no attempt at analysis.</p> <p>There is recognition of the variety of physics ideas but the connections are not made.</p>
	<p>(i) Use of physics</p> <p>(ii) Analysis and Interpretation</p>			(i) /5	(ii) /5		
Additional comments to support and explain ratings <b>A</b> and <b>B</b> :							

**CW TSA2**

RESEARCH REPORT Side 2 2864/02		Centre No :					
Candidate Name:		Candidate No :					
C o m m u n i c a t i o n	<div style="border: 1px solid black; padding: 2px; text-align: center; width: 40px; margin: 0 auto;">C</div> <p>(i) Content of the report</p> <p>(ii) Quality of report</p>	<p><b>Interest</b></p> <p>The report is clear, logical and interesting. The main argument or ideas are clearly summarised at the beginning or end.</p>	<p>The report is interesting to read. There is evidence of organisation which makes it easy to follow.</p>	<p>The report is a factual account of the work done.</p>	<p><b>Presentation</b></p> <p>The report makes an impact (e.g. particularly good and relevant illustrations). It adds value to the work done. It is not excessively long or verbose.</p>	<p>The report is neatly produced.</p>	<p>The report is poorly presented and detracts from the value of the work done.</p>
		<p><b>Structure</b></p> <p>There is a particularly good organisation of difficult ideas or complex data, and arguments are made easy to follow.</p>	<p>There is some continuity in the development of ideas, and the relationships between different aspects of the topic are clear.</p>	<p>The logic or development is hard to follow, with the structure perhaps dictated by the sequence in which evidence was gathered.</p>	<p><b>Illustrations:</b></p> <p>Illustrations are relevant, clear, and contribute to the communication of ideas. Graphical plots are well-chosen, to display results effectively.</p>	<p>Illustrations and graphs are basic, neat and without distracting elements.</p>	<p>Illustrations and graphs may be inadequate, or irrelevant and are not integrated into the text</p>
E v a l u a t i o n  a n d  c o n n e c t i o n s	<div style="border: 1px solid black; padding: 2px; text-align: center; width: 40px; margin: 0 auto;">D</div> <p>(i) Evaluation</p> <p>(ii) Connection</p>	<p><b>Evaluation</b></p> <p>There is good evaluation of the reliability, accuracy or suitability of the sources. The student may comment on any difference in views or ideas from the sources.</p>	<p>Some attempt is made to evaluate the accuracy and reliability of the sources, even if at a superficial level.</p>	<p>The student accepts the information collected, with little attempt to check reliability.</p>	<p><b>Connections</b></p> <p>There is interesting material from the wider context, which is related thoughtfully to the other concerns of the report and deepens or illuminates the account.</p>	<p>Information about the wider context is mentioned, but is limited to descriptive reporting without discussion or comment.</p>	<p>Some aspect of the wider context for the physics is mentioned, but without detail or discussion.</p>
		<p><b>Synoptic aspects</b></p> <p>The way in which the various aspects of physics work together are discussed.</p>	<p>The student identifies the different aspects of physics studied.</p>	<p>There is some attempt to identify the various aspects of physics.</p>			
<b>RATING TOTAL</b>		(i) /5	(ii) /5	/40			
Additional comments to support and explain ratings <b>C</b> and <b>D</b> :							
Assessors signature:				Date:			

CWTS A2