

Chatham Kent Regional  
**Science**  
**Fair**

2008-2009  
Information Booklet

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Chatham Kent Secondary  
School  
April 3<sup>rd</sup> and 4<sup>th</sup>

ENGAGING AND SUPPORTING YOUNG SCIENTISTS OF CHATHAM-KENT

## Message from the Chairperson

Fall, 2008

The 44<sup>th</sup> annual Chatham Kent Regional Science Fair will be held April 3<sup>rd</sup> to April 4<sup>th</sup> at Chatham Kent Secondary School in Chatham. The Fair is open to individual students and teams of up to 2 students in grades 5 to 12 in all Public, Catholic and Private and French language schools in the Municipality of Chatham-Kent.

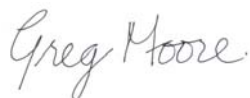
The Science Fair process is an excellent learning experience for students. Research projects demonstrate the validity of the scientific method and provide problem-solving experiences with emphasis on the inquiry-centered approach. Fair venues provide our young people with an opportunity to meet students from across the county and exchange project ideas.

The judging process is structured to provide encouragement, offer meaningful feedback and create a friendly environment when meeting the students and evaluating the respective research and project development.

Science Fair projects should be fun and exciting while motivating students to do research projects at higher academic levels. Many professional people cite their science fair experiences as being responsible for their decision to pursue the sciences and technology for the rest of their lives.

For those school districts and students who are past or current participants, we look forward to another exciting year of working together in this special forum. To our new participants, we offer assistance and support as you become acquainted with and actively engaged in our program. Together we will make a difference.

Sincerely,



Greg Moore  
Chair  
Chatham Kent Regional Science Fair



### Canada Wide Science Fair 2007

Truro, Nova Scotia

**Right** - Josh Segeren of Chatham-Kent

**Gold Medal** - Biotechnology & Pharmaceutical Sciences

Intermediate EnCana **Platinum Award** - Best Intermediate Project

# CHATHAM KENT REGIONAL SCIENCE FAIR 2008-2009

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### Canada Wide Science Fair 2007

Truro, Nova Scotia

Victoria Marchand of Chatham-Kent

**Bronze Medal** - Computing & Information Technology

Junior

## INTRODUCTION

For over 40 years the Chatham Kent Regional Science Fair (CKRSF) has provided an opportunity for students in the Chatham Kent area to engage in inquiry-based science and technology projects.

The Chatham Kent Regional Science Fair is an annual two-day fair for students from Grades 5 to 12. Students in Grades 5 to 6 compete in a Junior Fair while students in Grades 7 to 12 compete in a Senior Fair. Winners from the Senior Fair are eligible to participate in the Canada Wide Science Fair in May. Thanks to increased sponsorship, CKRSF has been sending 3 finalists to the Canada Wide Science Fair for the last 5 years. The number of finalists for 2009 will be dependent on the availability of funds.

The Chatham Kent Regional Science Fair is a non-profit, registered charitable organization. CKRSF relies on the local business and agricultural communities, both the Lambton Kent District School Board and the St. Clair Catholic District School Board, as well as dedicated parents and teachers for support.

The 2009 Chatham Kent Regional Fair will be held at Chatham Kent Secondary School in Chatham on April 3<sup>rd</sup> and April 4<sup>th</sup>.

## MISSION

Our mission is to encourage students in the Municipality of Chatham Kent in their interest and involvement in the pursuit of excellence in science and technology.

The CKRSF exists for the following purposes:

1. to organize, raise funds for, support, stage and promote the Chatham Kent Regional Science Fair
2. to provide assistance to students to participate in the Chatham Kent Regional Science Fair and the Canada Wide Science Fair

## INFORMATION FOR TEACHERS

Parallels for the Science Fair entry categories and the Ontario Curricula for Grades 1-8 and Grades 9 and 10 are indicated below.

The Ontario Curriculum Grades 1-8 page 4 states that a goal for students is:

- To develop the skills, strategies, and habits of mind required for scientific inquiry and technical design. In the Specific Expectations for grades 5 to 8 numerous references to the scientific methods embodied in the Science Fair project can be found in each of the 5 strands.

The Ontario Curriculum Grades 9 and 10 page 4 also states that a goal for a student is:

- To develop the skills, strategies, and habits of mind required for scientific inquiry. References also exist in the Specific Expectations for each of the 4 strands which support the Science Fair concept.

For **resources, materials, handouts** and **rubrics** please visit: <http://www.cksciencefair.com/links.htm>

## INFORMATION FOR STUDENTS

### Eligibility

1. To be eligible to participate in the Chatham Kent Regional Science Fair, a student must currently be registered and attending classes in Grades 5 to 12 in a Public, Catholic, French Language, or

Private school. Home schooled students living in the Municipality of Chatham Kent are also eligible.

2. Regional Science Fair entrants are NOT required to participate in a School Science Fair and may enter the Regional Science Fair independently.

### Grade Categories

1. Grade 5 – Grade 5 individual or Grade 5 team
2. Grade 6 – Grade 6 individual or Grade 6 team or Grade 5/6 team
3. Grade 7 – Grade 7 individual or Grade 7 team or Grade 6/7 team
4. Grade 8 – Grade 8 individual or Grade 8 team or Grade 7/8 team
5. Secondary – High school individual or team

Project teams, consisting of a **maximum of two students**, will be entered in the category of the more senior student; that is, a project team consisting of a grade 7 student and a grade 8 student will be entered into the Grade 8 category.

**Under no circumstances** will a Grade 5 or 6 student or Grade 6/7 team be eligible for participation in the Canada Wide Science Fair.

### Exhibit Divisions

1. A **Life Sciences** project examines:
  - i. Some aspects of the life or lifestyle of an organism.
  - ii. Biomedical or clinical aspects of human life or lifestyles and how that translates to improved health, health services or health products.
  - iii. Either a topic relating to planetary processes or the relationships of organisms to those processes, or between or among organisms.
  - iv. An application of biological systems to solve a problem, create a product or provide a service. It will fall into one of three subject fields: crop development, animal science and microbial.
2. A **Physical & Mathematical Sciences** project studies an abiotic phenomenon in order to understand the relation of identified factors, perhaps including a cause and effect relationship, or the use of math to solve theoretical problems.
3. An **Engineering & Computing Sciences** project deals with innovative software and hardware design, or applies physical science knowledge to solve a problem or achieve a purpose.

### Types of Projects

**Experiment:** an investigation undertaken to test a specific hypothesis.

**Study:** a collection and analysis of data to reveal evidence of a fact, situation or pattern of scientific interest. It could include a study of cause and effect relationships or theoretical investigations of scientific data.

**Innovation/Invention:** the development and evaluation of innovative devices, models, techniques or approaches in technology, engineering, or computers.

## GETTING STARTED

Here is what you should do once you have chosen your topic.

### **Step 1: Research your Topic**

Read books from the library; observe related events; gather existing information; look for unexplained or unexpected results. Talk to professionals; write to companies; and obtain or construct needed equipment.

### **Step 2: Organize and Theorize**

Organize your research. Narrow down your hypothesis by focusing on a particular idea.

### **Step 3: Make a Timetable**

Choose a topic that can be done in the amount of time you have. Identify important dates. Allow plenty of time to experiment and collect data. Leave time to write a paper and put together an exhibit.

### **Step 4: Plan your Experiment, Study or Innovation**

Write a research plan to explain how you will do your experiment.

### **Step 5: Consult your Teacher/Supervisor**

Discuss your work with an adult supervisor on an ongoing basis.

### **Step 6: Conduct Your Experiments, Study or Innovation**

Keep detailed notes of every experiment, measurement and observation. Change only one variable at a time when experimenting. Include control experiments in which none of the variables are changed. Include sufficient numbers of test subjects in both control and experimental groups.

### **Step 7: Examine Your Results**

When you complete your experiments, examine and organize your findings. Did your experiment give you the expected results? Was your experiment performed with the exact same steps each time? Are there other causes that you had not considered or observed? Were there errors in your observations? If possible, analyze your data statistically.

### **Step 8: Draw Conclusions**

Which variables are important? Did you collect enough data? Do you need to conduct more experimentation?

### **HELPFUL HINTS**

- Your title should be simple and represent your research accurately.
- If elements of your project cannot be safely exhibited at the fair, incorporate photographs of important phases of your experiment to use in your display.
- Your display should be presented logically and be easy to read. When you arrange your display, imagine you are seeing it for the first time.
- Make your display stand out. Use neat, colourful headings, charts and graphs.
- Homemade equipment, construction paper and coloured markers are excellent for project displays. Pay special attention to the labelling of graphs, charts, diagrams and tables.
- Be sure to adhere to the size limitations and safety rules when displaying your project.
- Make sure your display is sturdy.

**Project idea list** can be found at [www.cksciencefair.com](http://www.cksciencefair.com).

## NATURE OF THE PROJECT

There are three essential components to a good science fair project.

### 1. Investigation and Design

Having selected your topic, follow the eight steps out-lined in the Getting Started section of this booklet. For entry into the science fair, determine how to best classify your project based on exhibit division, grade category and type of project. Consult with your teacher and the chair of your regional fair and follow the information from page 5 of this booklet to make these decisions.

### 2. Written Materials

A science fair project requires the following written materials.

**Abstract:** An abstract is written once your research and experimentation are complete. It should include a statement of the problem/purpose of the experiment, the procedures used, and your conclusions. For the Chatham Kent Regional Fair, your abstract should be a minimum of 30 words and a maximum of 65 words.

Here is one example of a good abstract:

*This project studied the effectiveness of two pollution barriers (man-made and natural) and buffer zoning in reducing particulate pollution levels. Particulate levels were measured using home designed equipment. Man-made barriers were found to have the highest particulate reduction rate. Moving a distance of 5-10m from pollution sources also reduced particulates effectively.*

— Jordan Bowman, Intermediate Gold Medalist, CWSF 2005.

**Project Data Book:** A project data book should contain accurate and detailed notes to demonstrate consistency and thoroughness to the judges and to assist you with your research paper.

**Project Report:** A project report is typed. The text shall be in 12 point Times, Arial or equivalent type, double-spaced with margins of 1 inch all around. The Project Report has a maximum of five letter-sized (8.5" x 11" pages). Appendices may be used to include charts, diagrams, etc.) The Project Report includes the following:

1. **Title Page:** Centre the project title and put your name, address, school and grade at the bottom right (**not counted as one of the five pages**).
2. **Table of Contents:** Include a page number for the beginning of each section (**not counted as one of the five pages**).
3. **Introduction:** An explanation of what prompted your research and what you hoped to achieve.
4. **Purpose, Questions, Problem:** Make a brief statement about your investigation. This can be written as a question.
5. **Hypothesis:** Write the hypothesis. Remember this is your "educated guess," based on your previous knowledge and the research you completed.
6. **Materials:** Make a detail list of the materials used. These include consumables (e.g., water, paper towels). Be specific about the sizes and quantities. These also include non-consumables (e.g., test tube, beaker)
7. **Procedure:** Describe in detail the methodology used to collect your data. Include enough information for someone to repeat the experiment. Remember to write this in numbered steps, past tense, and passive voice.
8. **Observations / Results:** Present your observations and results in a form that is easily understood. The data should be in tables, graphs, or illustrations, each with a title. Include any calculations that are used. The results of the calculations can be shown in a table. Include detailed photographs or drawings.
9. **Discussion:** Thoroughly discuss exactly what you did in your project. Your results should be compared with theoretical values, published data, commonly held beliefs and/or expected results.

A discussion of possible errors should be included as well as how the data varied between repeated observations, how your results were affected by uncontrolled events, what you would do differently if you repeated the project and what other experiments should be conducted.

10. **Conclusion:** A summary of your results.
11. **Acknowledgements:** Credit individuals, businesses and educational or research institutions which assisted you. Identify financial support or in-kind donations (**not counted as one of the five pages**).
12. **References:** Always cite your resources. List any documentation that is not your own (i.e., books, journal, articles). Failing to do so is considered plagiarism. It is unethical and illegal (**not counted as one of the five pages**).
13. **Changes to a continued project:** If the project is a continuation of work done in a previous year or years, you must highlight any changes or modifications made (**not counted as one of the five pages**).

### 3 Display

The project should attract and inform, be easy to assess the study and results and make the most use of space with clear and concise displays. Displays must conform to the official Canada-Wide Science Fair maximum-size restrictions: 1.2 metres wide; 0.8 metres deep; 3.5 metres high from the floor. The display should include headings that stand out, posters containing written material and charts, clearly drawn and correctly labelled graphs and diagrams and some of the apparatus used so that key aspects of the project can be demonstrated.

#### Backboard

Backboards are an essential element for display of projects. They can be purchased or constructed. They must be self-supporting, light weight, and easily to assemble and disassemble.

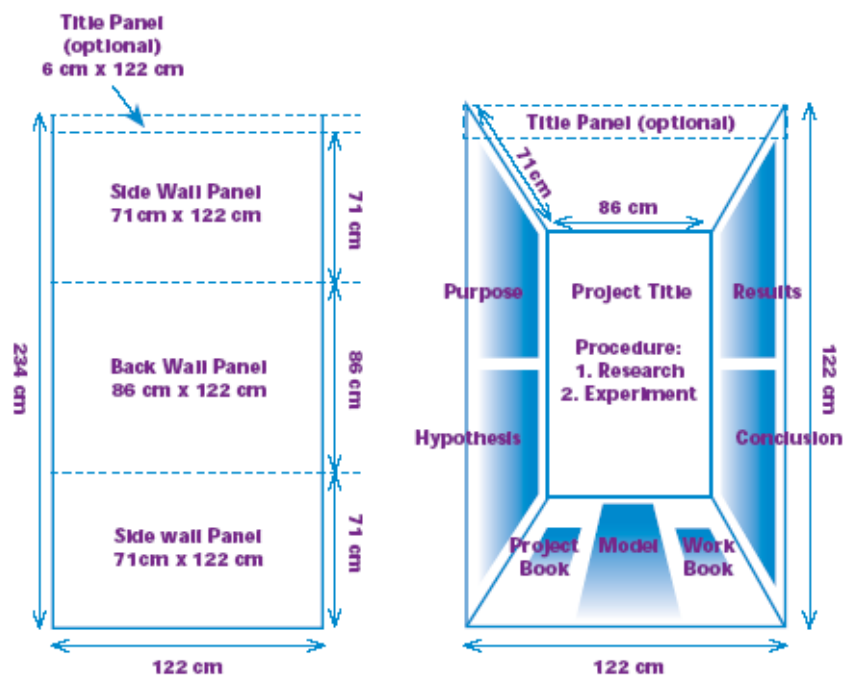
#### Additional backboard suggestions:

- Avoid air pockets behind any paper used to decorate backboard.
- Avoid overlapping sheets of paper.

#### A display can not...

- Display live vertebrates, live or dead plant life, flammable, corrosive, caustic, radioactive or toxic substances
- Display dangerous biological materials or unsealed biological samples, petri dishes, etc.
- Display gases under pressure without release valves
- Have open flames
- Have uncovered drive belts
- Have uninsulated electrical wires, cables or uncovered electrical circuits
- Be constructed of unapproved materials or use unapproved electrical equipment
- Be larger than the dimensions shown or unstable
- Contain photographs of people unless written consent has been obtained.

Display Layout



### **Important!!!**

- If hazardous materials or vertebrates were used, then a qualified person must have supervised the experiments
- No procedures can cause harm or distress to animals
- Power cords must have 3 wire grounded connections
- No lasers are operated during public display
- X-ray or other high energy radiation sources must be registered and approved by provincial authorities
- No manipulation of recombinant DNA or animal viruses

## **SAFETY REGULATIONS**

There are strict safety requirements which must be adhered to at all times. Safety requirements are constantly being reviewed and updated. Please refer to Chatham Kent Regional Science Fair 2006-2007 Project Display and Safety Regulations Booklet or follow the link [www.cksciencefair.com](http://www.cksciencefair.com) for complete and up-to-date safety information and regulations.

All participants must pass a safety inspection. Component(s) of a project or project in violation of safety regulations will be removed.

Projects which create the risk of harm for the student or others must be appropriately supervised ie. projects using firearms, ammunition, explosives, flammables or projectiles.

## **ETHICAL REQUIREMENTS**

Projects involving the participation of humans or the use of animals and where there is non-trivial risk require ethical approval from the project supervisor before experimentation is started. All projects under consideration for Canada Wide Science Fair must comply with ethical standards of the Youth Science Foundation of Canada (YSF). The policies are available for download from the YSF Canada web site as follows:

### **Use of Human Subjects**

[http://ysf.ca/files/PDF/governance/policy/en/4.1.1\\_Humans.pdf](http://ysf.ca/files/PDF/governance/policy/en/4.1.1_Humans.pdf)

### **Use of Animals**

[http://ysf.ca/files/PDF/governance/policy/en/4.1.2\\_Animals.pdf](http://ysf.ca/files/PDF/governance/policy/en/4.1.2_Animals.pdf)

**Failure to comply with YSF Canada ethical standards could result in your project being declared ineligible for participation for the Canada Wide Science Fair.**



### **Canada Wide Science Fair 2007**

TRURO, NOVA SCOTIA  
CHATHAM KENT REGIONAL SCIENCE FAIR TEAM  
(Left) Victoria Marchand, Josh Segeren, Greg Moore,  
Jenna Noorenberghe

## **PRIZES AND AWARDS**

### **DIVISIONAL FAIR PROJECTS**

Each project will be judged 2 or 3 times, on a judging criterion, which will be forwarded with the registration booklet and posted on the website – [www.cksciencefair.com](http://www.cksciencefair.com). as early as January. Projects will be awarded divisional prizes as follows:

Gold Level – Medal and \$50 per project  
Silver Level – Ribbon, certificate and \$30 per project  
Bronze Level – Ribbon, certificate and \$20 per project

### **TOP PROJECTS AWARDS** - (subject to sponsorship availability).

Of the gold medal winners in the Junior Fair, one will be named Top Grade 5 Project and one Top Grade 6 Project.

Top Grade 5 Project in 2007 was sponsored by **Burger King Restaurant - \$100.**  
Top Grade 6 Project in 2007 was sponsored by **McDonalds Restaurants - \$100.**

Of the gold medal winners of the Senior Fair, up to 3 participants will receive an all expense paid trip to the Canada Wide Science Fair being held in Winnipeg, Manitoba in May 2009. Value of each Canada Wide Science Fair bursary is valued at \$1600.

Canada Wide Bursaries in 2008 were sponsored by:

**International Truck and Engine Corp  
Ontario Power Generation Inc – Lambton Generating Station  
BFI Canada / Ridge Landfill  
Sci-Tech Ontario**

From the Canada Wide Bursary Winners, one project will be selected BEST IN SHOW and will receive the **Pfizer Canada Minister's Award of Excellence.**

### **COMMUNITY SPONSORED AWARDS**

Special Awards, as indicated below, were given in 2008. Additional Community Awards for 2009 are subject to sponsorship renewal. Additional Community awards may be added. Please check website for updated list.

#### **AGRICULTURE AWARDS**

- Prairie Engineering Inc
- Syngenta Inc
- 4 H Club – Chatham-Kent

#### **AERODYNAMICS**

- Sontair Ltd

#### **CHEMISTRY**

- Shopper's Drug Mart – Nortown Plaza  
Clair, Chatham
- Shopper's Drug Mart - Tilbury

#### **ELECTRONICS/COMPUTER TECHNOLOGY**

- Canada Business Services

#### **ENERGY**

- Ontario Power Generation Inc, Lambton  
Generating Station

#### **ENVIRONMENT**

- Jim Todgham Memorial Award – Mr.  
and Mrs. Herb Todgham
- EnviroExpo Award - VIA Rail Canada

**INNOVATION**

- Chatham Chapter - Ont. Assoc. for Certified Engineering Technicians & Technologists

**LABORATORY**

- Ontario Association of Medical Laboratories

**MUSIC/SOUND**

- Frank's Music
- Strings and Things
- Tapp Sound Production

**NEW TECHNOLOGY**

- Professional Engineers of Ontario – Chatham-Kent Chapter

**DIVISIONAL AWARD SPONSORS**

- Todgham & Case Associates Inc
- Mallory Industries
- Catherine McVean I.O.D.E.
- Thames Sales Yard

**GENERAL SPONSORS**

- Lambton Kent District School Board
- St. Clair Catholic District School Board
- Kiwanis Club of Chatham Kent – Golden K
- Knights of Columbus #1412
- Association of Professional Engineers (Kent Chapter)
- Arctic Glacier
- Staples - Chatham
- Hon. Ray Lawson Canadian Legion Branch 28
- Randolph Churchill I.O.D.E.
- Commercial Copy Centre
- Chatham Kent Chapter Professional Engineers of Ontario
- Meritor Suspension System Company – Chatham

- Dillon Consulting
- University of Ontario Institute of Technology

**PROJECT TESTING AND MARKETING**

- Chatham and District Chamber of Commerce

**PHYSIOLOGY OR ANATOMY**

- Chatham Kent Chiropractic Society

**SCHOLARSHIP**

- University of Ottawa (Senior Project in Grades 11 or 12)
- Nipissing University ( Project in Grades 9 to 12)

**DIVISIONAL SPONSORS**

- Chatham Optimists Club
- CAW Local 35
- AGRIS Co-Operative Ltd
- St. Agnes Catholic Women League

- International Truck and Engine Chatham Plant
- Essex Kent Chapter of Consulting Engineers
- International Brotherhood of Electrical Workers, Local 773
- Chatham Chapter - Ont. Assoc. for Certified Engineering Technicians & Technologists
- Laidlaw Education Service
- Thompson Limited
- Greenfield – Commercial Alcohol Limited
- Dresden Rotary Club
- Jody A O'Neil
- Denise Spadotto and Paul Greco
- Mr. Greg & Catherine Moore
- Chamberlain / Mercury Press

Please visit our website for up-to-date information on Awards, Scholarships, and Bursaries:

[www.cksciencefair.com](http://www.cksciencefair.com)

## FOR MORE INFORMATION

### PUBLIC SCHOOLS

Lisa Smith  
Blenheim District  
Secondary High  
School  
519-676-5485

### CATHOLIC SCHOOLS

Greg Moore  
Our Lady of Fatima  
Catholic School  
519- 351-4040

### FRENCH LANGUAGE SCHOOLS

Bernard Tremblay  
École secondaire de  
Pain Court  
519- 352-1614

### PRIVATE SCHOOLS & INDEPENDENT ENTRIES

Greg Moore  
Our Lady of Fatima  
Catholic School  
519- 351-4040

## ENTRY FORMS AND DEADLINES

Entry form package will be forwarded to all schools and posted on the Website by January 31<sup>st</sup>, 2009.

Entry deadline is Thursday, March 27th, 2009.

## STAPLES - OFFICIAL PROJECT DISPLAY BOARD SPONSOR

Staples in Chatham will be offering students involved in the Chatham Kent Regional Science Fair a 15% discount on project display boards. Offer starts January 1<sup>st</sup>, 2009 and expires April 3<sup>rd</sup>, 2009.

# JUDGE'S MARKING SHEET

Project Number: \_\_\_\_\_ Project Title: \_\_\_\_\_

Student Name(s): \_\_\_\_\_

<b>PART A: VISUAL DISPLAY 10%</b>	<b>Max</b>	<b>Mark</b>
Layout: <input type="checkbox"/> logical, organized and makes efficient use of space <input type="checkbox"/> attractive and well-constructed	4	
Content: <input type="checkbox"/> headings stand out <input type="checkbox"/> any charts, graphs and diagrams are clearly labeled and drawn <input type="checkbox"/> displayed written material is free of grammatical / spelling errors	6	
<b>Total Mark for Visual Display</b>	<b>10</b>	

<b>PART B: ORAL PRESENTATION 10%</b>	<b>Max</b>	<b>Mark</b>
Presentation: <input type="checkbox"/> clear and enthusiastic <input type="checkbox"/> logical, well-organized flow <input type="checkbox"/> preparation and rehearsal evident	6	
Responses to questions: <input type="checkbox"/> clear and logical <input type="checkbox"/> demonstrate understanding	4	
<b>Total Mark for Oral Presentation</b>	<b>10</b>	

<b>PART C: PROJECT WRITTEN MATERIALS 10%</b>	<b>Max</b>	<b>Mark</b>
<b>Abstract</b> is a clear and concise statement of the problem/purpose, procedures used, data and conclusions. <b>Project Data Book</b> is an accurate and detailed record demonstrating consistency and thoroughness	4	
<b>Project Report</b> is a five page summary consisting of the following (completed neatly and accurately): <input type="checkbox"/> Proper report format: (title page, table of contents, introduction, purpose, hypothesis, materials, procedure, observations/results, discussion, conclusion) <input type="checkbox"/> Acknowledgments of support/assistance <input type="checkbox"/> References Listed	6	
<b>Total Mark for Written Materials</b>	<b>10</b>	

<b>PART D: ORIGINAL CREATIVITY 25%</b>			
<b>LEVEL 1 (low)</b> Mark Range 5 to 10	<b>LEVEL 2 (fair)</b> Mark Range 10 to 15	<b>LEVEL 3 (good)</b> Mark Range 15 to 20	<b>LEVEL 4 (excellent)</b> Mark Range 20 to 25
<input type="checkbox"/> Little imagination shown. Project design is simple with minimal student input. A textbook or magazine type project.	<input type="checkbox"/> Some creativity shown in a project of fair to good design. Standard approach using common resources or equipment. Topic is a current or common one.	<input type="checkbox"/> Imaginative project, good use of available resources. Well thought out, above ordinary approach. Creativity shown in design and/or use of materials.	<input type="checkbox"/> A highly original project or a novel approach. Shows resourcefulness. Creativity in design, use of equipment and/or construction of project.
Mark			

<b>PART E: SCIENTIFIC THOUGHT 45%</b>					<b>Mark</b>
<b>Type of Project</b>					
<b><u>Experiment</u></b> An investigation undertaken to test a scientific hypothesis using experiments. The variables, if identified are controlled to some extent.		<b><u>Innovation</u></b> The development and evaluation of innovative devices, models or techniques or approaches in technology engineering or computers (hardware or software).		<b><u>Study</u></b> A collection and analysis of data to reveal evidence of a fact or a situation of scientific interest. It could include a study of cause and effect or theoretical investigations of scientific data.	
<b>Assessment Evidence:</b>		<b>LEVEL 1 (low)</b>		<b>Mark Range 5 to 15</b>	
<input type="checkbox"/> Duplication of a known experiment to confirm hypothesis. <input type="checkbox"/> Hypothesis is totally predictable.		<input type="checkbox"/> Model/device duplicates existing technology.		<input type="checkbox"/> Study of existing printed material related to the basic issue.	
<b>Assessment Evidence:</b>		<b>LEVEL 2 (fair)</b>		<b>Mark Range 15 to 25</b>	
<input type="checkbox"/> Extension of a known experiment through modification of procedures, data gathering, and application.		<input type="checkbox"/> Makes improvement to, or demonstrates new applications for existing technological systems or equipment. <input type="checkbox"/> Justifies improvements or new applications.		<input type="checkbox"/> Study of material collected through a compilation of existing data and through personal observations. <input type="checkbox"/> Display attempts to address a specific issue.	
<b>Assessment Evidence:</b>		<b>LEVEL 3 (good)</b>		<b>Mark Range 25 to 35</b>	
<input type="checkbox"/> Devise and carry out an original experiment with controls. <input type="checkbox"/> Identify and control some significant variables. <input type="checkbox"/> Carry out analysis using graphs/simple statistics.		<input type="checkbox"/> Design and build innovative technology or provide adaptations to existing technology <input type="checkbox"/> Identifies human benefit and/or economic applications.		<input type="checkbox"/> Study based on observations and literary research illustrating various options for dealing with a relevant issue. <input type="checkbox"/> Includes appropriate analysis (arithmetic, statistical or graphical) of some significant variable(s).	
<b>Assessment Evidence:</b>		<b>LEVEL 4 (excellent)</b>		<b>Mark Range 35 to 45</b>	
<input type="checkbox"/> Devise and carry out original experimental research. <input type="checkbox"/> Attempts to control or investigate most significant variables. <input type="checkbox"/> Includes statistical analysis of data.		<input type="checkbox"/> Integrate several technologies, inventions or designs and construct an innovative technological system. <input type="checkbox"/> Identifies important human benefit and/or commercial benefit.		<input type="checkbox"/> Study correlating information from a variety of significant sources which may illustrate cause and effect or original solutions to current problems through synthesis. <input type="checkbox"/> Identifies significant variable(s) with in-depth statistical analysis of data.	
<b>TOTAL MARKS</b>					<b>FINAL MARK</b>
PART A /10	PART B /10	PART C /10	PART D /25	PART E /45	<b>/100</b>
<b>Judge's Name (Please Print):</b>			<b>Judge's Signature:</b>		