Computer Programming, Apps & Robotics Judging

Student Name (s): _____, Year level: _____

School: _____

Project Title: _____

Type of Project: eg simulation, control of a robot, demonstration of a Science concept, ...

Criteria for Judging

- Years R-7: the entry programs a robot using Lego Mindstorm, eLabtronics, Microbic or similar program.
- Years 7-12: the entry programs a computer using Java, C++, Fortran, Visual Basic or similar language.
- This is a science competition, not a programming contest. Entries should contain a substantial science content.
- Simulations must exhibit a scientific principle and allow other users to vary parameters and see the effects.
- Where possible, two judges should assess each project, and decide on winners by consensus.

The entry meets the programming requirements of Years R-7 or 7-12 as above?	
What programming language(s) and tools were used to create the project?	
Does the entry contain significant Science content? What is this Science concept that is explored or used? Is the science accurate?	
How effective is the robot/ computer program in investigating or demonstrating the Science idea?	
Why did the students choose to do this project? Why did they do it using a computer / robot?	
Does the project have a practical use? Who would use it, and why?	
Is the project appealing? Would another person want to use it?	
Are the images/displays of the project appropriate for the material? (Consider use of pictures, charts, diagrams, numbers displayed appropriate units)	
How robust is the project? Does it gracefully handle bad input from users? Does it crash?	
What documentation accompanies the project? Are there clear instructions explaining how to load and use the program?	
Is there a hard copy of the program, and an explanation of what the sections of the program do?	
Is the project substantially the work of the students? If help was received, has it been acknowledged?	
What is the overall assessment of the project? Which elements are particularly striking?	
Any other comments?	

Science Writing Judging Rubric

Rules and presentation:

- The science writing fits within the word limit for its year level
- It is on one of the titles set
- It has been written by one person
- A Bibliography is included with correct referencing of illustrations, facts / data and quotes. Different methods of referencing are permitted e.g. Harvard or Footnotes. In-text referencing for Yr 7-12

Note: Science Writing can be in a number of genre styles. The entry may also include illustrations to support the genre.

Scientific content	Rich scientific content which is accurate and highly relevant	Scientific content is accurate. Some content lacks depth and relevance	Some scientific content which is not always accurate. Lacks depth and relevance	Lack of scientific content
Originality and creativity	Highly original and creative	Original and creative	Some degree of originality and creative	Not original or creative
Depth of research	Excellent range of Science based resource material used and correctly cited in the entry.	Good range of Science based resource material used and correctly cited in the entry.	Some Science based resource material used in the entry but not always correctly used.	Minimal Science based resource material used and / or not used correctly.
Communication and Science terminology	Science concepts are logically sequenced and communicated very clearly. Very accurate use of scientific terminology	Science concepts are logically sequenced and communicated to a sound level. Good use of scientific terminology with minimal errors.	Some evidence of logical sequencing and communication of science concepts. Uses limited scientific terminology or terminology has some errors	Entry lacks clear sequencing or communication of Science concepts. Scientific terminology missing, or used incorrectly.
Writing skills	Excellent grammatical skills.	Good grammatical skills – few errors.	Some writing skills shown but with many grammatical errors.	Poorly written with many grammatical errors.
Evaluation of information **(particularly for Discussion, Persuasion / Exposition genres)**	Commentary or conclusions are very logical and strongly evidence based. Shows excellent analysis.	Commentary or conclusions are logical and evidence based to a sound level. Shows good analysis.	Some indication of commentary or conclusions being evidence based. Shows some analysis.	Conclusions are missing, or not supported by evidence. Shows little or no analysis.

Scientific Inquiry Judging Rubric

Rules and presentation:

- A scientific method of investigation followed
- must be the entrants' own work and must be original work
- must include a log book / journal, a completed risk assessment form, and the report (scientific style report or poster)
- must meet Animal Ethics requirements if animals were used during the Scientific Inquiry
- any assistance must be acknowledged

Log book / Journal Rubric

Dates			All dates of work clearly recorded.	Most dates of work clearly recorded.	Dates not given or are unclear.
Notes	Log clearly shows extensive work in progress. Log contains all on-going thoughts and notes. Ideas recorded. Research notes recorded. Results recorded.	Log shows most on-going thoughts and notes. Most ideas recorded. Most research notes recorded. Most results recorded.	Log shows evidence of some on-going thoughts and notes. Some ideas recorded. Some research notes recorded. Some results recorded.	Log shows limited evidence of on-going thoughts and notes. Missing one significant component either ideas, research notes or results.	Log incomplete, missing the significant components of ideas, research notes or results.
Research	Extensive research related to topic done. Research links to the investigation. Three or more sources of information used. References recorded.	Some research related to topic done. Research links to the investigation. Two sources of information used. References recorded.	Some research related to topic done, but only one source of information used. Research links to the investigation. Reference recorded.	Some research related to topic done, but only one source of information used. Research not clearly linked to investigation. Reference recorded.	No research related to topic done. No sources of information used. References not recorded.
Results			All results clearly recorded.	Most results recorded.	No results recorded.
Risk Assessment and Assistance	Risks assessed and control measures clearly described. Full details of all assistance clearly given.	Most risks identified and their control measures clearly described. Good details of assistance given.	Some risks identified but little information on controlling them. Details of assistance outlined.	Risks identified but controls not listed. Assistance mentioned but details not given.	Risks not identified. Assistance not acknowledged but evident in project.

Scientific Inquiry Report Judging Rubric

Format		The report is clearly set out and is easily followed. Uses the headings given in rules or similar.	The report has all components but is not well set out.	The report is missing components or is difficult to follow.
Questioning and predicting	The question and prediction of the inquiry is clearly understandable.	Either the question or prediction of the inquiry is clearly understandable but not both.	The question and prediction of the inquiry is unclear.	No question and prediction of the inquiry is recorded.
Planning and conducting	Clearly explains the reasons for doing the inquiry. Many variables identified, clearly states the variable changed and the variable measured. 'Fair test' method clearly outlined. Steps done are detailed and clear, easy to repeat inquiry exactly.	Explains some reasons for doing the inquiry. Some variables identified, clearly states the variable changed and the variable measured. 'Fair test' method clearly outlined. Steps done are missing the detail needed to repeat inquiry exactly.	Does not have a clear reason for doing the inquiry. Only the variable changed and the variable measured are identified, no other variables. Attempts to outline a 'fair test'. Some of the steps done are unclear or incomplete.	Does not have a reason for doing the inquiry. Variables not clearly identified. Little or no evidence of a 'fair test'. Steps done are unclear.
Equipment and materials	All equipment listed. Risks identified, assessed and their control clearly described.	Most equipment listed. Most risks identified and their control clearly described.	Some equipment listed. Some risks identified but little information on controlling them.	Equipment not listed. Risks not identified.
Processing, analysing data	Result details accurately recorded. Presentation of results excellent and appropriate. Analysis highly detailed and patterns identified.	Result details accurately recorded. Presentation of results satisfactory. Some analysis and some patterns identified.	Result details accurately recorded. Presentation of results inaccurate or inappropriate. Little analysis and limited patterns identified.	Results obviously not recorded accurately. Presentation of results inaccurate or inappropriate. Poor analysis.
Evaluating	Identifies and explains appropriate improvements for the investigation. Clearly explains the usefulness of the investigation results. Shows appropriate thinking for future investigations on the topic.	Identifies and explains some appropriate improvements for the investigation. Gives some reasons why the investigation results are useful. Shows some thinking for future investigations on the topic.	Identifies and attempts to explain possible improvements for the investigation. Gives few reasons why the investigation results are useful. Shows little thinking for future investigations on the topic.	Does not identify nor explain possible improvements for the investigation. No reason given for the usefulness of the investigation results. No thought given to future investigation on the topic.
Communication	Conclusions from investigation clearly communicated. Scientific terms used extensively and correctly throughout the report. Contains extensive background information.	Conclusions from investigation communicated Most scientific terms used correctly in the report. Contains some background information.	Conclusions from investigation not clearly communicated. Few scientific terms used in the report or scientific terms used incorrectly. Contains little background information.	No communication of conclusions from investigation. No scientific terms used. Contains no background information.
Bibliography		Detailed recording of information sources.	Some recording of information sources.	Little or no recording of information sources.

Electronic and Board Games Judging Rubric

Rules and presentation:

- The box must be no larger than 60cm x 40cm x 20cm and the game must weigh less than 8kg including box
- Your electronic game must be presented on a platform that is accessible by all digital devices (PC and Mac and/or Android and/or iOS)
- All parts clearly labelled
- Rules clear and easy to follow
- Age group the game is intended for is identified

Board game Packaging & Labelling *(use only for board games)*	Sturdy packaging. Visually appealing, great use of colour and design. Clear layout with good display of game content.	Good packaging. Visually good with good use of colour and design. Details of game content evident	Good packaging. Visually acceptable with some use of colour and design. Some details of game content evident.	Packaging holds the contents. Visually uninteresting and little use of colour and design. Minimal details of game content evident.	Packaging flimsy. Visually unappealing. Details of game content not evident.
Digital game Presentation *(use only for electronic games)*	Easily accessible from any device. Visually appealing, great use of colour and design. Clear layout with good display of game content.	Accessible from only, either computer or tablet devices. Visually good with good use of colour and design. Details of game content evident.	Some restrictions to accessibility on any device. Visually acceptable with some use of colour and design. Some details of game content evident.	Requires specific program/app installation to run. Visually uninteresting and little use of colour and design. Minimal details of game content evident.	Issues with accessibility or running of the game, some merit observed. Visually unappealing. Details of game content not evident.
Science content	A high level of science content and it is stated correctly. Players use an extended range of science facts, skills and processes during the game.	Good science content is present and stated correctly. Players use a good range of science facts, skills and processes during the game.	Science content is present and most stated correctly. Players use a basic range of science facts, skills and processes during the game.	Some science content is present but not always stated correctly. Players use very few science facts, skills and processes during the game.	Science content is very limited or not always stated correctly. Players do not need to use any science facts, skills and processes during the game.
Clarity of rules	All rules are very clearly stated and all points of possible conflict are predicted and solved to the player's understanding.	Most rules are very clearly stated and game can proceed. Most points of possible conflict are predicted and solved.	Most rules are clearly stated and game can proceed at a basic level. Some points of possible conflict are predicted and solved.	Rules are stated but are not all clear. Some points of possible conflict are not predicted or solved.	Rules are not stated. The course of the game is unclear.
Originality of rules	It is a new game idea and has a new or innovative way of proceeding or winning.	It is a new game idea but uses traditional ways of proceeding or winning.	It is loosely based on existing games and has some original ways of proceeding and winning.	It is based on an existing game with some modification to playing and/or winning.	It is a plain copy of an existing game.
Player involvement	All players maintain interest throughout the game. It rewards players who know and use science concepts.	Most players are involved and the game proceeds with interest; more science and skill is needed to keep going.	Most players are involved; the game proceeds smoothly; some science and skill is needed to keep going.	1 or 2 players are involved; some interest is evident; the game proceeds rapidly; lots of chance is involved to win.	Player interest is minimal; the game is over quickly; not all players are involved.

Models and Inventions Judging Rubric

Rules and presentation:

- Must have a short, written report within the word limit for the year level
- Scientific concept or content obvious
- Maximum size 1m x 1m x 1m; maximum weight 8kg
- Original input, not just made from a kit
- No live animals / plants
- Clear labels on all parts
- Risk assessment form completed
- Acknowledge any help

Written report

Scientific principle / concept	Scientific principle / content clearly stated. Relevant science concepts fully explained. Scientific terms used accurately.	Scientific principle / content stated. Relevant science concepts mainly explained. Scientific terms used satisfactorily.	Scientific principle / content stated but with some flaws. Relevant science concepts satisfactorily explained. Some scientific terms used.	Scientific principle / content stated but with many flaws. Relevant science concepts poorly explained. Few scientific terms used.	Scientific principle / content absent. Few scientific terms used.
Construction explained	Construction technique fully explained. Appropriate detail provided to be able to repeat construction. Problems encountered identified and fully discussed.	Construction technique mainly explained. Most detail provided to be able to repeat construction. Problems encountered identified and satisfactorily discussed.	Construction technique explained, however, needs more details to be able to repeat construction. Some problems encountered mentioned but limited discussion.	Construction technique poorly explained. Little detail provided to enable a repeat construction. Problems identified but not discussed.	Limited construction technique. No detail provided to enable a repeat construction. Problems neither identified nor discussed.
Operation instructions	Operation instructions fully explained. Clear instructions.	Operation instructions given. Most instructions clear.	Operation instructions given however, some instructions are incomplete or unclear.	Some operation instructions given however, many instructions incomplete or unclear.	Operation instructions poorly explained or missing
Risk Assessment and Assistance	Risks assessed and control measures clearly described. Full details of all assistance clearly given.	Most risks identified and their control measures clearly described. Good details of assistance given.	Some risks identified but little information on controlling them. Details of assistance outlined.	Risks identified but controls not listed. Assistance mentioned but details not given.	Risks not identified. Assistance not acknowledged but evident in project.

Models and Inventions Judging Rubric

Construction

Creativity / resourceful / originality / new application	Model / Invention shows a high level of creativity and / or innovative approach to deliver science concepts.	Model / Invention shows good creativity and / or unusual approach to deliver science concepts.	Model / Invention shows satisfactory level of creativity and /or approach in delivering science concepts.	Model / Invention shows little creativity and /or approach in delivering science concepts.	Model / Invention is a copy of a 'text book' or other model.
Design and construction	Design and construction shows excellent skill; is neat and very sturdy. Expensive materials are not necessary to fulfil this criterion.	Design and construction shows good skill; is neat and sturdy.	Design and construction shows moderate skill; is neat and moderately sturdy.	Design and construction shows some skill; is fairly neat. Works initially but is not sturdy enough for frequent use.	Design and construction shows little skill; is insufficiently sturdy.
Working	Model / invention is interactive, it works reliably.	Model / invention has some interactive part, it works fairly reliably.	Model / invention has some interactive part, not reliable in working.	Model / invention has some interactive part, but does not work	Model / invention is static.

Multimedia Judging Rubric

Rules and presentation:

A written report, within the word limit, that includes:

- The URL for the web site (if a web based entry)
- A list of any software used to create the video or web page
- A bibliography of all sources of information
- A discussion of any problems and how you overcame them
- Acknowledgment of any assistance with editing, graphics, design, or technical help with equipment or software

The entry must meet the technical specifications set for each type of entry

Communication of main ideas	Presentation has excellent links to topic chosen and obviously tells the story of the topic.	Presentation has good links to topic chosen. Over-all story of topic is clear.	Presentation clearly links to topic chosen. Over-all story of topic is unclear.	Presentation has limited links to topic chosen. Over-all story of topic is unclear.	Presentation not linked to topic chosen. What is the story?
Science content / Student investigation	Obvious and accurate science content that is highly appropriate and reflects the student/s own science investigation.	Obvious and accurate science content that is mostly appropriate and reflects the student/s own science investigation	Science content included. Most science ideas accurate.	Limited science content included. Some science ideas accurate.	Science content absent, unclear or inaccurate.
Originality and Creativity	Highly original and highly creative.	Original and creative.	Moderate degree of originality and creativity.	A minimal degree of originality and creativity.	Not original or creative.
Quality of Production and Technique	Outstanding	Good	Satisfactory	Fair	Poor
Positive Impact on Viewer	Outstanding impact. Eye-catching.	Good impact	Satisfactory impact	Weak impact	No impact

Photography Judging Rubric

Rules and presentation:

- One of the set titles
- 6 or less photos, max size of each print is 25cm x 20cm, each print has a caption
- Mounted on a single sheet of light card maximum size 51cm x 65cm (including border, frame)
- Entrants own work, including any effects. (commercial developing permitted)
- Written statement no more than 100 words on back
  - make and model of camera or technology
  - developing / printing process used
  - special effects processes / packages used

Title			Title heading eye-catching, easy to read.	Title heading eye-catching but not easily read.	Title heading absent or unclear.
Communication of ideas.	All photos have single idea and are clearly linked to the title. Photos obviously tell the story.	Most photos have a single idea and are clearly linked to the title. Over-all story is apparent.	Some photos have a single idea within the title but rely on other photos. Over-all story is unclear.	The photos are complicated trying to explain several ideas within the title. Photos rely on captions to relate the story.	The idea within most photos is unclear. What is the story?
Science content	The entry has excellent and accurate science content.	The entry has good science content included. Science content is accurate.	The entry has some science content included. Most science ideas accurate.	Limited science content included. Some science ideas accurate.	Science content absent, unclear or inaccurate.
Caption / statement	Captions short clear statements and are directly relate to photos and the title. Captions add depth and detail to the story.	Captions short clear statements and relate to photos and to the title. Captions add some detail or depth to the story.	Captions long but clear statements. Captions relate to photos and the title. Captions add limited detail or depth to the story.	Captions very long statements. Captions must be read to understand the photo and relate to the title. Captions dominate the telling of the story.	Captions absent or obscure.
Quality of photos	Excellent quality. Focus, depth of field and exposure is appropriate. Composition draws the viewer's eye to the main idea in the photo.	Good quality. Focus depth of field and exposure or OK. Composition mostly shows main idea in photo.	Satisfactory quality. Focus, depth of field and/or exposure could be better. Composition generally shows the main idea in the photo.	Satisfactory quality. Focus, depth of field or exposure setting distracts from the photo. Composition contains unnecessary, distracting parts which detract from the photos.	Poor quality. Focus, depth of field or exposure setting distracts from the photo. Composition does not show main idea in photo.
Display of photos	Photos displayed in eye-catching way. Order and placement of photos greatly enhances the story. Photos trimmed or framed to enhance the story. Photos dominate the display, not the background or captions.	Photos displayed well. Order and placement of photos simple but helps the story being told. Photos not trimmed or framed to enhance the story. Photos dominate the display, not the background or captions.	Photos displayed satisfactorily. Order and / or placement of photos simple and adds little to the story being told. The background and / or captions dominate the display instead of the photos.	Photos not displayed well. Order and / or placement of photos is jumbled. The background and / or captions dominate the display instead of the photos.	Photos obviously missing. Display unfinished.

Posters Judging Rubric

Rules and presentation

- The poster must be on one of the titles set
- The poster must be no larger than 51cm x 65cm including border, frame and / or overhang
- The poster must be flat not 3D
- The poster must be done or mounted on light weight cardboard, as paper tends to rip
- The poster must have a single science idea
- The poster must be imaginative
- Minimum words, readable at a distance, bold and visually appealing

Science content	Excellent expression of a single science idea. Science content accurate, clear and relevant.	Good expression of a single idea. Science content accurate and relevant.	Expresses more than one science ideas, or science content limited.	Some connection to a science idea. Science content may be inaccurate.	Science content absent.
Communication of ideas	Science ideas, content and graphics / pictures clearly linked to title. Science message simply and clearly expressed.	Graphics/pictures and content linked to title. Science message is satisfactorily expressed.	Graphics/pictures or content tenuously linked to title. Science message apparent but not well expressed.	Science idea, graphics / pictures or content irrelevant to title. Science concept is inaccurate.	Science idea, graphics / pictures and/or content not linked to the title.
Layout of poster	Layout is coherent; information is easy to read at a distance; well supported by relevant pictures/graphics. Excellent visually appealing	Layout is clear; pictures and information well located. Information easy to read at a distance. Good visual appeal.	Layout not coherent; pictures and information are not placed well; cannot be read at a distance. Fair visual appeal.	Layout poor or irrelevant to the title; lacks detail, few pictures or graphics; poster not on cardboard. Limited visual appeal	No effective layout. No connection with the title. Poor visual appeal.
Information relevant to title	All information is relevant to title and correct. There are no spelling mistakes or grammar errors	Most of the information is relevant to the title and correct. There are few or no errors in grammar or spelling	Some of the information is relevant to the title. There are some errors in grammar and spelling	Not enough information relevant to title; frequent spelling and grammar errors, information copied without acknowledgment	Information not relevant to title

Crystal Investigation Judging Rubric

Rules and presentation:

- The crystal must be Potassium Aluminium Sulphate (Potash Alum)
- Students are expected to carry out all manipulations of the material but may be assisted by a teacher or guardian as appropriate. Assistance must be acknowledged in the logbook.
- Crystals are judged upon;
  - Regularity i.e. sharpness of edges,
  - Smoothness of faces
  - Clarity - overall aesthetic appeal
- Size is no longer a major criterion
- Crystals whose largest dimension is less than 9 mm will not be considered for certificates of merit under the RACI national competition guidelines

Where very similar crystals are difficult to rank for prizes or certificates then the logbooks and the hypotheses proposed will be considered to make a decision. The logbook should state dates from the start to the finish of the growing period and each entry dated and countersigned where possible.

Crystal - Regularity	Crystal shows excellent regularity of edges, and symmetrical growth (Diamond shape)	Crystal shows mostly good regularity of edges, with only small imperfections evident. Shows mostly symmetrical growth	Regularity of edges somewhat uneven or chipped. May be somewhat asymmetrical	Poor regularity of edges Crystal highly asymmetrical (not diamond shaped or lop-sided growth)
Crystal - Faces	Faces are highly light-reflective and smooth (no growth lines evident)	Faces are mostly light-reflective and fairly smooth (may be slightly uneven)	Faces are poorly light-reflective, demonstrate minimal growth lines or patterning and/or may show minimal evidence of efflorescence (whitening of crystal)	Faces exhibit little to no light reflection, high levels of uneven growth or patterning and/or high levels of efflorescence (whitening of crystal)
Crystal - Clarity	Excellent clarity of crystal. Highly transparent through the crystal. Crystal is clear (without imperfections) throughout Excellent overall aesthetic appeal	Good clarity of crystal. May have some small imperfections throughout. Good overall aesthetic appeal	Reasonable clarity of crystal. Some small amount of opacity in the centre of the crystal or discolouration throughout or a large number of imperfections. Reasonable aesthetic appeal	Crystal demonstrates high levels of opacity and or discolouration Poor aesthetic appeal
Logbook - Hypothesis	Original and creative hypothesis. Clearly and concisely states scientific purpose. Very accurate use of scientific terminology	Mostly creative hypothesis. Scientific purpose stated well. Accurate use of scientific terminology	Hypothesis shows some originality and/or creativity. Fair expression of scientific purpose although may be somewhat inaccurate with science content. Uses some scientific terminology or terminology has some errors	Unoriginal hypothesis. Unclear scientific purpose or inaccurate or no science content. Hypothesis may be stated as a question Scientific terminology inaccurate or poorly expressed
Logbook - Evaluation and analysis	Science content is accurate and highly relevant Excellent grammatical skills. Analysis and conclusions are highly logical and strongly evidence based. Shows excellent analysis.	Scientific content is mostly accurate with some content lacking depth and relevance Good grammatical skills with very few errors. Analysis and Conclusions are logical and evidence based to a sound level.	Scientific content not always accurate with content lacking depth and relevance Sound grammatical skills shown but with occasional errors. Some attempt at analysis with indication of conclusions being evidence based.	Minimal scientific content evident Poorly written with many errors. Analysis and conclusions are missing, or not supported by evidence.