Programming, Apps & Robotics

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Write the instructions; be in control.

A successful SASTA Oliphant Science Awards Programming, Apps & Robotics entry:

- Has accurate science content, and uses scientific principles to get results.
- Serves a scientific purpose.
- Is engaging and interesting to use.
- Is user friendly and almost impossible to crash.

Computers are programmed to help scientists with their work. Programs can:

- ***Simulate behaviour using scientific understanding of interactions***

  Predicting the effects from a change is often difficult. Scientists might write mathematical equations of the many parts involved. They can then enter a virtual world where they can change some parts and the computer will work out the effect. The computer will also show the results in tables or graphs. Simulations are used instead of very long, difficult or dangerous experiments.

- ***Control robots***

  Robots use sensors to get information and then respond to a change. For example a robot could sense the temperature in a glasshouse and open or close vents to suit the growing plants. Some robots move around and can sense their surroundings. They might change their behaviour depending on what they sense. Robots could be used in search and rescue situations to locate people and send a signal of where they are.

- ***Model or help to demonstrate a scientific idea or principle***

  Programs can be written to show scientific concepts, or to model or simulate real life situations that are difficult to measure directly. Also, seeing interactive graphics can often make things easier to understand.

- A successful entry must do more than just follow a fixed sequence of steps. It should be innovative, and should show how the application could be applied to a practical application, or help solve a problem.

Rules for Programming, Apps & Robotics:

- Entries for all year levels may program a robot or application or a computer program.
- A group of up to three students can complete a Programming, Apps & Robotics entry. (The highest year level in the group will determine the year category of the entry)
- All entries will be judged on the elements that are the students' own work, and not on the robot itself, or the computer language that has been applied. The judges will place high value on the originality of the entry and the potential wider practical applications that it may address.
- Robotics entries may use recognised formats such as Lego Mindstorm, eLabtronics, Microbric or similar programs. Robots can be built from a kit, bought ready-made, or individually constructed.
- Programming and Apps entries may use recognised programming languages such as Java, C++, Fortran, or Visual Basic.
- Your entry must include a written report that includes the following:
  - The aim of the entry, and its scientific purpose and potential applications
  - The type of robot or computer/device required to run the program
  - Clear instructions on loading or using the entry
  - A hard copy of the program and an explanation of what the sections of the program do
  - Acknowledgment of any external support provided to the entry
  - A bibliography that acknowledges relevant sources of information.

In presenting your Programming, Apps & Robotics entry:

- **An electronic copy of your report / programming details MUST be uploaded to the Oliphant Science Awards website between 10 June - 1 July.** Details can be found here: https://bit.ly/OSAOnlineSubmission
  - Please be sure to include any links to your program/app or videos/photos of your robot in your report for judges to review. Students are asked to include an email address where they can be contacted directly by the judges should they require any further information.
- You are required to bring your own entry with you for judging. You will need to book an appointment time online for **Saturday 30 July** (booking available in June), to demonstrate your entry to the judges and discuss its features and uses. Robots will be photographed so you will be able to take your robot home with you after judging.