Your EdVenture into Robotics
10 Lesson plans

Links to the Australian Curriculum

for years 3, 4, 5, 6, 7 and 8

www.roboticswps.com.au

www.meetedison.com

Relevance to NAPLAN testing (Australian national student testing)

Students find robotics highly engaging which assists in rapid learning in areas such as science, technology, engineering and maths (STEM). However there are other educational elements can be leveraged from this high level of engagement.

Throughout the lesson plans students provide written responses to describe their programs and the actions that their robots take. In the design brief worksheets students get to plan and create their own programs. They also write descriptive behaviours for icons used in their program.

The experience of Robotics WPS has shown that most students struggle with taking information from a visual stimulus and transferring it to written text.

These lesson plans, assist students with written responses from visual stimulus being a picture, graph or chart. This is a critical skill that is assessed in NAPLAN testing.

This is one of the areas where Robotics WPS has seen huge improvements in student's developing their ability and understanding of how to transfer the acquired knowledge of their programs to written text.

Example of a completed design brief worksheet

Year 3

Science – Science Inquiry Skills

Questioning and predicting
With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge (ACSIS053).

Planning and conducting
Suggest ways to plan and conduct investigations to find answers to questions (ACSIS054).

Communicating
Represent and communicate ideas and findings in a variety of ways such as diagrams, physical representations and simple reports (ACSIS060).

Maths

Number and place value
Represent and solve problems involving multiplication using efficient mental and written strategies and appropriate digital technologies (ACMNA057).

Data representation and interpretation
Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies (ACMSP069).

Interpret and compare data displays (ACMSP070).

Year 4

Science – Science Inquiry Skills

Planning and conducting
Safely use appropriate materials, tools or equipment to make and record observations, using formal measurements and digital technologies as appropriate (ACSIS055).

Questioning and predicting
With guidance, identify questions in familiar contexts that can be investigated scientifically and predict what might happen based on prior knowledge (ACSIS064).

Maths

Data representation and interpretation
Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values (ACMSP096).

Year 5

Science – Science Inquiry Skills

Questioning and predicting
With guidance, pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be (ACSIS231).

Planning and conducting
With guidance, plan appropriate investigation methods to answer questions or solve problems (ACSIS086).

Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate (ACSIS087).

Processing and analysing data and information
Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (ACSIS090).

Evaluating
Suggest improvements to the methods used to investigate a question or solve a problem (ACSIS091).

Communicating
Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts (ACSIS093).

Maths

Number and place value
Solve problems involving multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies and appropriate digital technologies (ACMNA100).

Use efficient mental and written strategies and apply appropriate digital technologies to solve problems (ACMNA291).

Data representation and interpretation
Pose questions and collect categorical or numerical data by observation or survey (ACMSP118).

Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies (ACMSP119).

Year 6

Science – Science Inquiry Skills

Planning and conducting
With guidance, plan appropriate investigation methods to answer questions or solve problems (ACSIS103).

Decide which variable should be changed and measured in fair tests and accurately observe, measure and record data, using digital technologies as appropriate (ACSIS104).

Processing and analysing data and information
Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (ACSIS107).

Compare data with predictions and use as evidence in developing explanations (ACSIS221).

Evaluating
Suggest improvements to the methods used to investigate a question or solve a problem (ACSIS108).

Communicating
Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts (ACSIS110).

Maths

Data representation and interpretation
Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables (ACMSP147).

Interpret secondary data presented in digital media and elsewhere (ACMSP148).

Year 7

Science – Science Inquiry Skills

Questioning and predicting
Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSIS124).

Planning and conducting
Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (ACSIS125).

In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task (ACSIS126).

Processing and analysing data and information
Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships, including using digital technologies as appropriate (ACSIS129).

Evaluating
Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method (ACSIS131).

Communicating
Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate (ACSIS133).

Maths

Data representation and interpretation
Identify and investigate issues involving numerical data collected from primary and secondary sources (ACMSP169).

Year 8

Science – Science inquiry skills

Questioning and Predicting
Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (ACSIS139).

Planning and Conducting
Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (ACSIS140).

In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task (ACSIS141).

Processing and analysing data and information
Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships, including using DIGITAL TECHNOLOGIES as appropriate (ACSIS144).

Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions (ACSIS145).

Evaluating
Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method (ACSIS146).

Use scientific knowledge and findings from investigations to evaluate claims (ACSIS234).

Communicating
Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate (ACSIS148).

Maths

Data representation and interpretation.
Explore the practicalities and implications of obtaining data through sampling using a variety of investigative processes (ACMSP206).