

illumin8 STEM Club Resource Package

This resource package has been developed as a 'ready to implement' science club for community use across Australia, to inspire a positive relationship for young people and their families with the fields of science, technology, engineering and mathematics (STEM).

The package is designed to provide fun, hands-on, activity based exploration across six STEM themes, each broken into 3 sessions (18 sessions in total):

- **Module 1: Air and Flight**
 - 1.1 Aerodynamics
 - 1.2 Rockets & the Laws of Motion
 - 1.3 Fluid Dynamics and Vortex Rings

- **Module 2: Water**
 - 2.1 Wonderful Water
 - 2.2 Water Filtration
 - 2.3 Ocean Properties

- **Module 3: Weather**
 - 3.1 Weather Forecasting
 - 3.2 Temperature
 - 3.3 Wild Weather and Natural Disasters

- **Module 4: Electronics**
 - 4.1 Energy
 - 4.2 Circuits
 - 4.3 Motors

- **Module 5: Engineering**
 - 5.1 What's it all about?
 - 5.2 Environmental Engineering
 - 5.3 Chemical Engineering

- **Module 6: Computers & Coding**
 - 6.1 Computer Talk
 - 6.2 Block Coding
 - 6.3 Algorithms & Apps

Material has been designed to enable facilitators with all levels of scientific background to readily present each session. Links to references for further reading (online) have also been provided for each module, to support and extend facilitator's understanding of content.

Resources provided for each module include:

- **Coordinator notes:** outlining session content, lesson plans, technology required, experiment procedures / expected results, materials needed and references for additional reading.
- **Risk Assessments**
- **Videos:** Short video demonstrations of more complex experiments / activities and hands-on challenges have been provided to support facilitator understanding.
- **PowerPoint slides,** to aid visual learning styles and support explanation of content.

Note: Presenter notes for each slide set have been provided within the PowerPoint files and as a separate Pdf version, for use as “scripts” by facilitators. Pdf versions of essential slides have also been included for each module, which facilitators may choose to print as booklets for participants, to allow easy adaptation for low technology venues.

Modules have been designed with flexibility and adaptability in mind. Lesson plans provided enable delivery of either 45 minute, 75 minute, 90 minute or 120 minute session durations. Before selecting the ideal duration for a club, facilitators should note the following:

- **120 minute or 2 x 60 minute session durations:** Provide engaging background information to deepen understanding of concepts related to the module theme, include 1 or more short experiments/activities to explore module theories and promote hands-on engagement with science, and include an exciting hands-on “challenge” activity. This session length suited to upper primary and lower secondary schools students (NSW Stages 3 – 4) due to the increased theory component. *These sessions can be delivered as 2 hour blocks, or, lesson plans indicate when to break for delivery of content into 2 x 1 hour concurrent sessions.*
- **90 minute session durations:** Provide slightly reduced theory components, include 1 or more short experiments/activities, and an exciting hands-on “challenge” activity. Suited to both upper primary and lower secondary school aged students.
- **75 minute session durations:** Include core theories relevant to understanding of concepts for the module’s exciting hands-on “challenge” activity. May include 1 or more short experiments / activities to build understanding prior to undertaking the “challenge”. Suited to middle primary, upper primary and lower secondary school aged students.
- **45 minute session durations:** Include only basic theory relevant to understanding of concepts for the module’s exciting hands-on “challenge” activity. A reduced version of the weekly challenge is included. Suited to smaller clubs (15 or less participants) and to middle primary, upper primary and lower secondary school aged students.

Note: Some 45 minute sessions may benefit from being extended to 60 minutes, particularly for larger groups.

At the facilitator's discretion, Clubs may choose to use notebooks as 'science journals' during sessions (one per participant) for making predictions, recording hypotheses and results, or noting important facts. Alternatively, this can be achieved through group discussion.

A short list of group engagement activities have been included with this resource package. These may be useful as ice-breaker games at the beginning of club sessions, or, for engaging students during experiments with long wait times.

Feedback forms have been provided for students, parents/guardians and coordinators to complete at the end of each session. Feedback assists with continued improvement of your club experience, assessment of the resources, and informs development of future modules. Please encourage feedback forms to be completed to help you refine your program. Inspiring Australia would be interested to hear of your findings.

Most importantly, enjoy yourself and the Club! We have provided a 'ready to use' resource, however, please feel free to adapt and build on the tools provided to best suit participant needs, interests, venue, and materials available in your location. Good luck with your activities. Inspiring Australia would love to hear how it goes!

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