SHE MAPS

FREE VERSION

DRONE CLUB by She Maps

www.shemaps.com

CONTENTS

WELCOME

This Drone Club Kit is a package of information, resources, advice and planning, created to make the role of the Drone Club Coordinator easier; from identifying the purpose of your club, deciding who participants should be, planning for safety, to identifying the budget.

Whether you are just starting out or looking for a new direction in your STEM club, this kit is a reliable planning tool for coordinators of Drone Clubs for a variety of situations.

The activities in this kit will support students to explore a range of 21st century skills, including:

1. Critical thinking
2. Creativity
3. Collaboration
4. Communication
5. Information literacy
6. Media literacy
7. Digital literacy
8. Flexibility
9. Leadership
10. Initiative
11. Productivity
12. Social skills

This is the free version of the Drone Club Kit, gifting you 9 of the total 30 activities. To access the full Drone Club kit and the other 21 activities you will need to purchase a She Maps Membership. This annual membership gives you unlimited access to ALL our amazing teaching resources, providing you with an endless supply of lessons and inspiration.

Here is what is included in this pack:

1. Resource Library (sample activities)
2. Plan
3. Safety Guide (full kit only)
4. Posters

We can't wait to see you all flying!

Paul Mead
Managing Director
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CHECKLIST

Requirement: This Drone Club program is designed for indoor flying.

It is recommended that all participants, both teachers and students, begin with **Classroom Drone Essentials**. This short course provides participants with the skills needed to develop the foundational drone skills to tackle any of our suggested Drone Club activities.

This program is included as part of our She Maps Membership and if you don't have access to this program click here for more details.

CLUB ORGANISATION	DURING SESSIONS
◦ **Drone Kit:** Drones, Tablets, Landing Mats, Safety Gear. ◦ **Schedule** a Drone Registration Event ◦ **Posters** for Advertising Drone Club Registration Event. ◦ **Lesson Materials** (e.g. Obstacle Course, Image Mats, Design Materials, Drone Attachments)	◦ Flight Package: 1 drone, tablet and landing mat per team. 3 x Safety Goggles ◦ Safety Zones marked out ◦ Safety Posters visible and on all entry doors ◦ Resources Materials

PLAN

Identifying the purpose of your Drone Club is essential to creating a successful program. Consider the following and then fill out your plan on the following page.

- **Drone Club Coordinator:** Have at least one Coordinator and an assistant. The assistant can take the place of the coordinator in their absence. It is suggested that both the coordinator and assistant have completed the Classroom Drone Essentials Professional Learning so that they are confident and competent to lead the club.

- **Year Level and Number of Participants:** Will your club be for only one selected year level or is it open to all levels? You want to be able to control your numbers so that all participants are engaged throughout the sessions.

- **Goals:** What do you want to achieve - Manual Flight, Coded Flight, Design Activities or even activities without flying drones? Record at least three goals that will be achieved by the Club during their sessions. Use these goals to plan your activities.

- **Drone Club room:** Where will it be held? We recommend flying microdrones indoors to maximise successful flights, minimise weather concerns and so that there is no need to worry about local airports.

- **Drone Packs**: Which drones will you need? How many? She Maps have drone packs that make the decision a lot easier and you can chat to someone on the team if you have a question about any of our classroom packs. Click here to view our classroom kits.

- **Essential Resources:** What other resources will you need to host the activities?
  We've added the essential items, but you have some choices to make about whether you need an obstacle course, physical coding resources (image mats etc).

DRONE CLUB PLAN

Drone Club Name: _____

Drone Coordinator and Assistant: _____

Drone Club Room: _____

Year Level/s: _____ **Number of Participants:** _____

Goals:

1. _____
2. _____
3. _____
4. _____
5. _____

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ESSENTIAL ITEMS

1. **Classroom Drone Essentials**
2. **Drone Equipment** - Microdrones, tablets, safety glasses and landing mats. To purchase drone equipment click here for Classroom Kits. Set up your tablets and drones before your first session.
3. **Identified indoor flying area -** Drones and excited students require a reasonable amount of space!
4. **Safety Checklist**
5. **Hair Ties -** All loose hair must be tied back.
6. **Spare batteries and chargers -** Saves time and hassle of charging the battery in the drone itself.
7. **LiPo battery bags -** Flame retardant bags or containers to keep the Lithium Polymer batteries, to reduce the very small risk of fire - one for charged and one for discharged batteries.
8. **A downward facing camera -** 3D printed attachment to utilise the use of the forward facing camera in a Tello.
    - Mirror mount
    - Mirror sheets
9. **Landing mats -** mouse pads are great.
10. **Spare parts -** especially propellers.
11. **Safe storage area -** Where will the drones be kept safely between sessions?
12. **Know Your Drone -** CASA Poster - Know Your Drone

Extra Resources

Anything that improves the experience:
Obstacle course, Image Mats, 3D printed attachments, craft materials, extra tablets/laptops

1ST SESSION

SAFETY AND TEAM ORGANISATION

SUGGESTED LESSON TIME: 1 HOUR

This session asks students to exercise critical thinking and collaborative skills as they consider potential dangers, suggest practical solutions, and carry out a safety check on their microdrone. This lesson also serves as a critical prerequisite and basis for further activities and lessons related to using drones in a safe and responsible manner.

This lesson should be revision of their knowledge of **Classroom Drone Essentials** and the safety protocols they followed during those sessions.

Resources:

- Drone packs - including tablets, landing pads and safety goggles
- Room set up planned. Consider if students are going to assist with room set up

Instructions

- Be explicit with your instructions. Creating a routine that members will understand is essential for starting Drone Club sessions and is memorable.
- Assign members to groups of two to three per drone. No pilot should ever fly solo.
- Discuss the different roles of each member
- Watch Flying For Fun
- Go through the safety guidelines.

Provide enough time for teams to have their first flight during this lesson. This is a satisfying reward for going through the mandatory safety checks.

Tips & Tricks

This session is not the most exciting, but it is essential. Encourage students to repeat the safety checks at the beginning of every Drone Club session so that it becomes second nature to them and they understand all aspects of being a drone pilot.

MANUAL ACTIVITIES

1. Obstacle Course
2. Drone Baseball
3. Simon Says
4. Blind Folded Pilot
5. Treasure Hunt
6. Search & Rescue
7. Battleship
8. Target Practice
9. Golden Drone
10. Photography

MANUAL ACTIVITIES

OBSTACLE COURSE

Suggested Lesson Time: 1 Hour

Introduction
Using microdrones, teams are required to navigate an obstacle course in a set pattern - think Red Bull Air Racing, but with microdrones!

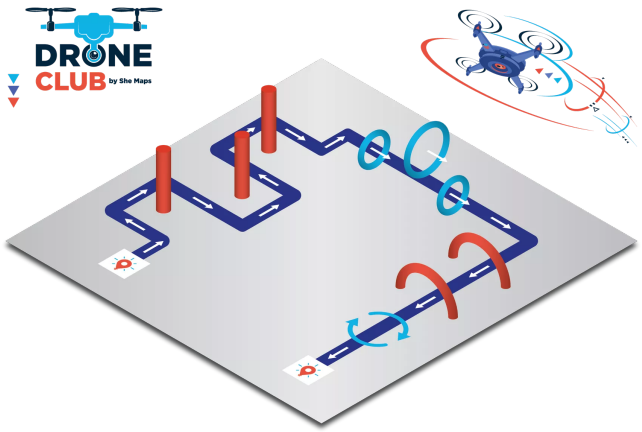
Objectives:
- To use manual flight to navigate a series of obstacles.
- To use positive encouragement within the team to complete course.

Resources:
- Pool noodles, hoops, cones or other building materials.

Instructions
The obstacle course should consist of a minimum of 3 obstacles that challenge the teams to fly in different ways. This can include direction and height (remembering for safety that drones should not fly above shoulder height).

- Always start on landing mat.
- Complete in a set order.
- The challenge can be timed or untimed.
- Participants can use manual or coded flight to complete the challenge.

Tips & Tricks
To increase the difficulty, challenge students to code their drones through the obstacle course. Can they do it without any errors? How quickly can they complete the course?



MANUAL ACTIVITIES

DRONE BASEBALL

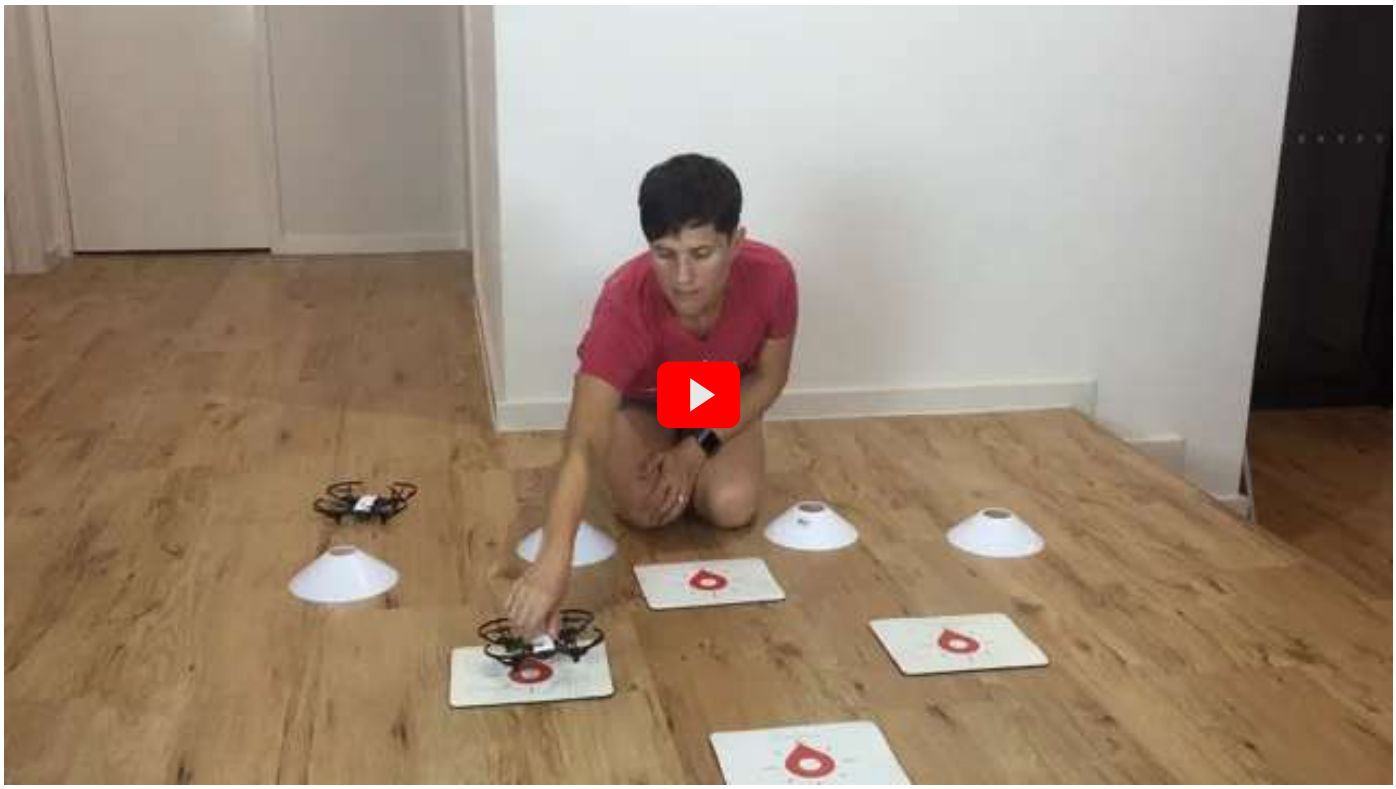
Suggested Lesson Time: 30 Minutes

Introduction
A simple game involving microdrones with a baseball diamond. Suitable for all students. Get ready for a fast-paced, noise inducing, laughter packed activity!

Objectives:
- To use manual flight to take off, move and land on the next landing mat.
- To use positive encouragement within the team to complete a home run.

Resources:
- Four "landing mats"

Instructions
Drone Baseball Lesson Plan



Tips And Tricks
Talk about the stress of trying to be successful within a certain amount of time. Remind students of battery life and working together to encourage each other. There is also a coded flight drone baseball lesson, use them together or separately.

MANUAL ACTIVITIES

SIMON SAYS

Suggested Lesson Time: 30 Minutes

Introduction

Think 'Simon Says' with drones. Participants must listen carefully to the instructions given. If teams don't complete the instruction or they don't complete it within a certain time, they are out.

Objectives:

- To use manual flight to complete a series of verbal instructions.
- To follow the rules of the game and to identify when they have been eliminated.

Resources:

- Drone teams
- One Leader

Instructions

Demonstrate a game of drone 'Simon Says'. Give a verbal instruction that a drone can complete. For example, "Simon says, turn the drone 90 degrees to the right". All teams should complete the task with their drone.

- **Beginner:** Leader gives a single instruction for each team to complete.
- **Intermediate:** Leader gives 2-3 instructions for each team to complete within a 2 minute time period.
- **Advanced**: Leader gives a series of verbal instructions that each team must code and complete successfully within a 10 minute time period.

Examples:

- **Beginner:** Yaw to the right 90 degrees.
- **Intermediate:** Decrease elevation, move forward approximately 20cm and flip to the left.
- **Advanced:** Code drone to move make a 1m x 1m square. Camera must be facing in one direction throughout flight.

Tips And Tricks

The 'Simon Says' rules can be applied - If the leader doesn't say "Simon says" the team is eliminated.

MORE LESSONS?

This great teaching resource has been created exclusively for She Maps Members, schools and teachers who pay an annual membership fee to access all our world-class teaching resources.

If you purchase a She Maps Membership, you will gain access to the other **21 lessons** included in this resource. You'll also get access to ALL our other teaching resources which will save you heaps of planning time.

Become a She Maps member for $240 AUD per user to unlock all activities.

LEARN MORE

CODED ACTIVITIES

1. **Aerial Survey**
2. **Obstacle Course**
3. **Drone Baseball**
4. Drone Choreography
5. I-Spy
6. Eagle Eyes
7. Cinematography
8. Tight Squeeze
9. Search & Rescue
10. Relays
11. Advanced Coding Activities

Become a She Maps member to unlock all activities.

CODED ACTIVITIES

AERIAL SURVEY

Suggested Lesson Time: 1 -2 Hours

Introduction
Challenge students to code and collect photographic data over a simulated natural disaster. How will they code their microdrone?

Objectives
- To effectively block code their drone over a identified area.
- To download and identify quality data.

Resources:
- Image Mat or planned scene for drone to fly over.

Instructions

This activity is designed to be an open-ended challenge. There is no right or wrong answer to the coding challenge.

Inform students that there has been a natural disaster (earthquake, cyclone, flooding, bushfire) in a local area and they are the geospatial scientists that have been tasked with programming their drones to fly over the area to collect image data.

Encourage students to step out, draw and design their code as they plan their flight. This allows students to start creating to code that has fewer errors so they experience greater success.

Allow students to test blocks of code in stages to make sure they are successful before creating the full project.

Tips & Tricks
If you are interested in Image Mats please click on the following link and scroll to the bottom of the page.
She Maps STEM Gear

CODED ACTIVITIES

OBSTACLE COURSE

Suggested Lesson Time: 2 Hours Or More

Introduction
Have your students mastered the obstacle course with their manual flight skills? Why not try coding it?

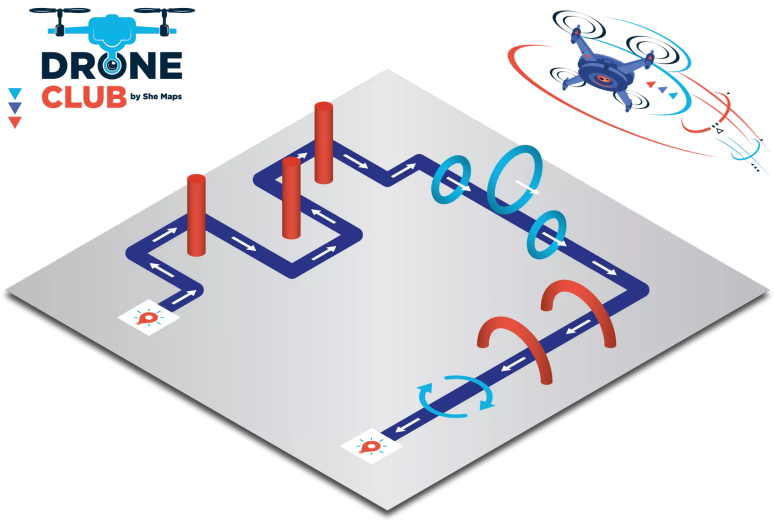
Objectives
- To use coded flight to navigate a series of obstacles.
- To use positive encouragement within the team to complete the course.

Resources:
- Pool noodles, hoops, cones or other building materials.

Instructions
The obstacle course should consist of a minimum of 3 obstacles that challenge the teams to fly in different ways. This can include direction and height (remembering for safety that drones should not fly above shoulder height).

- Always start on landing mat.
- Complete in a set order.
- The challenge can be timed or untimed.

Tips & Tricks
Obstacle courses can be teacher designed or challenge students to create their own. There is no limit to the types of courses you can create. The team may have to pick up an item at the other end and bring it back to the landing zone as an added challenge.



CODED ACTIVITIES

DRONE BASEBALL

Suggested Lesson Time: 1 Hour

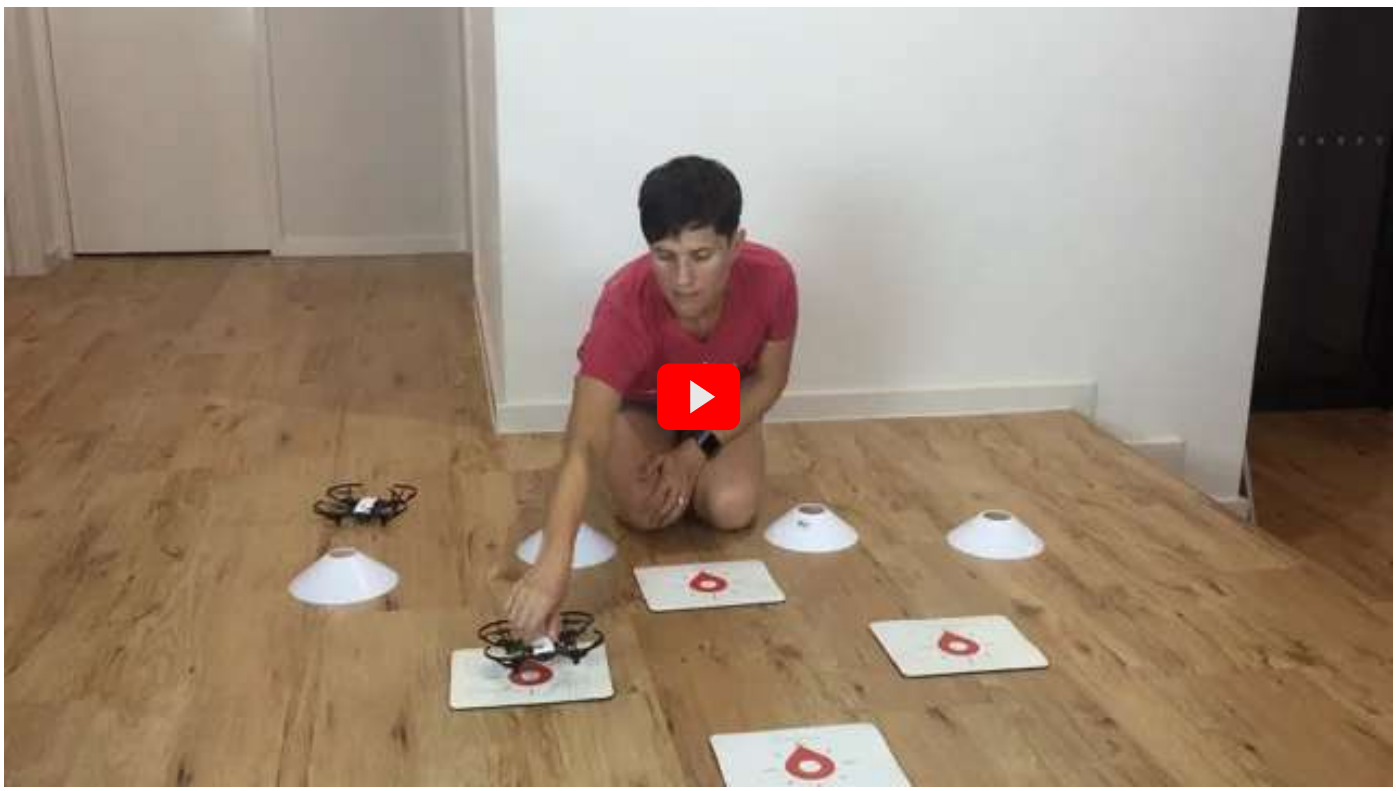
Introduction
The manual flight game with a baseball diamond, but increase the difficulty by adding coding to the challenge.

Objectives:
- To use coded flight to take off, move and land on the next landing mat.
- To use measurement and geometry to solve a problem.
- To use positive encouragement within the team to complete a home run.

Resources:
- 4 X "landing mats"

Instructions
Drone Baseball Lesson Plan

Use the same rules as the manual flight drone baseball, but challenge students to achieve a home run using code. Discuss identifying distances between bases and the angles needed to achieve a successful flight.



Tips And Tricks
Talk about the stress of trying to be successful within a certain amount of time. Remind students of battery life and working together to encourage each other.

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LEARN MORE

DESIGN & BEYOND ACTIVITIES

1. Safety Poster Design
2. Drones For The Future
3. Microdrone Attachment
4. Propeller Challenge
5. GIS Treasure Hunts
6. Stepping Out Code
7. Dronie App
8. Drone Drop
9. Invent A New Drone Challenge

Become a She Maps member to unlock all activities.

DESIGN AND BEYOND ACTIVITIES

SAFETY POSTER DESIGN

Suggested Lesson Time: 1 Hour

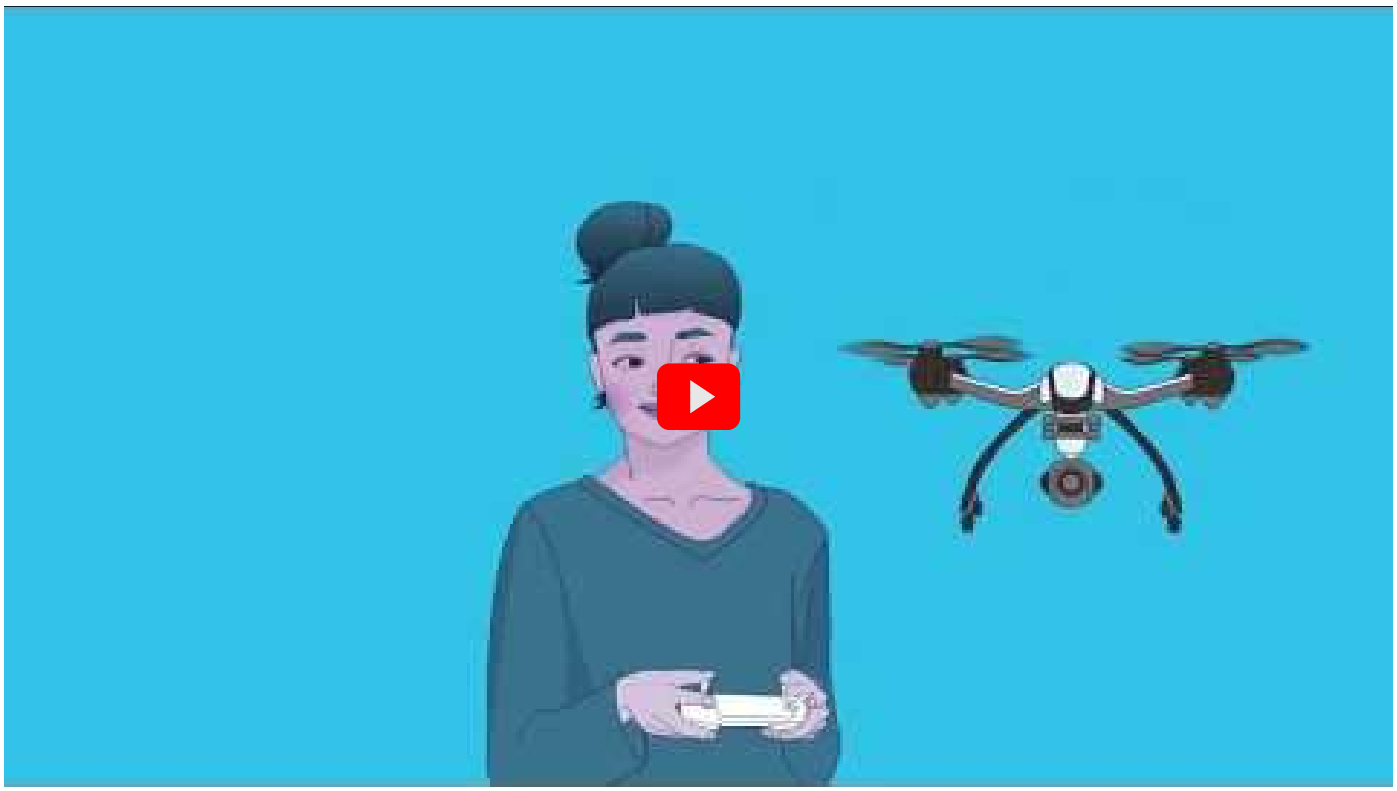
Introduction
Challenge students to create their own safety posters to remind club members of their roles and responsibilities as drone pilots.

Objectives
- To understand the roles and responsibilities of a drone pilot.
- To design and create a poster that reminds others of rules and regulations for drone flight.

Resources:
- CASA Know Your Drone

Instructions
- Challenge students to create safety posters that remind members of the rules and regulations that all drone pilots must follow. Use the CASA safety brochure and the website, Know Your Drone to help inspire students.

Tips & Tricks
Create digitally designed posters or use craft materials such as pencils, felt-tip pens, pastels or paint.



DESIGN AND BEYOND ACTIVITIES

DRONES FOR THE FUTURE

Suggested Lesson Time: 2 Hours Or More

Introduction
What jobs could you see drones doing in the future? Do some research and design your own drone!

Objectives
- To research the jobs that drones are involved in now
- To imagine and design what drones can do in the future

Resources:
- Writing and drawing materials
- Recyclable/craft materials
- 3D printer

Instructions

- There are plenty of videos on YouTube to inspire future drone design. Present some of your choices to the class, or get students to do their own research.

- Challenge Drone Club members to think about jobs that are a part of our society. Brainstorm different careers and tasks. Now challenge them to design a drone to be used in a particular job.

- Draw a diagram of their design for a future drone with detailed labels. Write a brief description to explain the type of job that it will complete.

- Using recyclable materials or if the Drone Club has access to a 3D printer students can create a model of their design.

Tips & Tricks

A great way to finish this activity is to have a "drone conference" where students present their drones from booths, with marketing, posters, digital presentations, etc. Each team can visit booths and see what others have created.

DESIGN AND BEYOND ACTIVITIES

MICRODRONE ATTACHMENT

Suggested Lesson Time: 1 Hour Or More

Introduction

Most microdrones can fly and take pictures, but what if you could create an attachment to broaden its range of skills?

Objectives

- To imagine and design an attachment for a microdrone

Resources:

- Writing and drawing materials
- Recyclable/craft materials
- Optional 3D printer

Instructions

- Challenge Drone Club members to design a new attachment for their microdrone.
- They can draw a diagram of their idea. They can also write a brief description to explain the type of job that it will complete.
- Using recyclable materials or if the Drone Club has access to a 3D printer students can create a model of their design.
- **Warning:** Just remember that microdrones have a small payload and if the attachment is too heavy it will affect the engine and can cause burn out.

Tips & Tricks

Create a parade of updated microdrones so each team can demonstrate their attachment.

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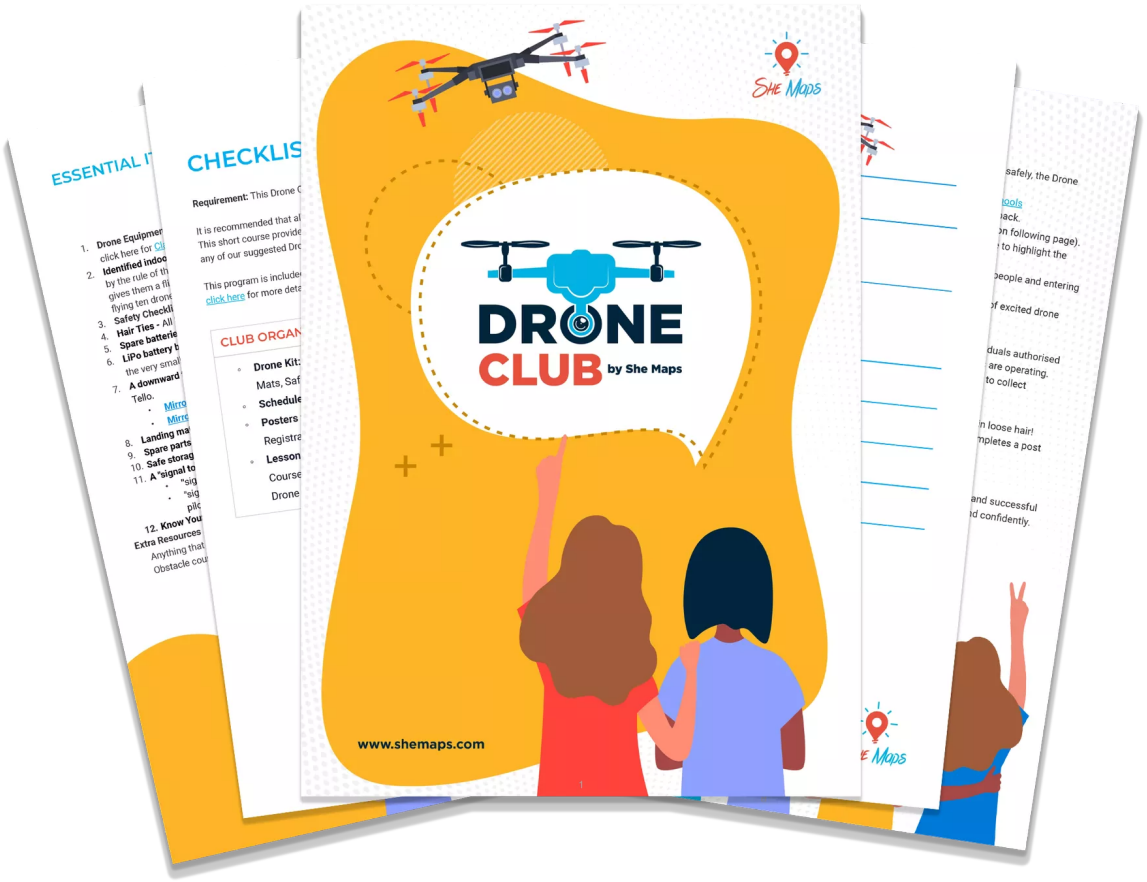

Remotely Piloted Aircraft Operating

CAUTION

AIRCRAFT MAY BE OVERHEAD

FOR YOUR SAFETY PLEASE LOCATE AND OBSERVE

DRONE CLUB by She Maps

REGISTRATION DAY

DATE:

TIME:

LOCATION:

TOP 10 DRONE CLUB TIPS

1. Focus on the fun and the skills.

2. Be organised. Have drones, batteries and tablets ready to go before every session.

3. Define the safety guidelines at the beginning of every session.

4. Be flexible.

5. Create a club that welcomes diversity.

6. More than one activity during a session encourages curiosity.

7. Provide opportunities for student members to become Drone Club assistants.

8. Encourage other staff to contribute.

9. Get creative.

10. Be involved, you can fly too!

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TEACHER RESOURCES

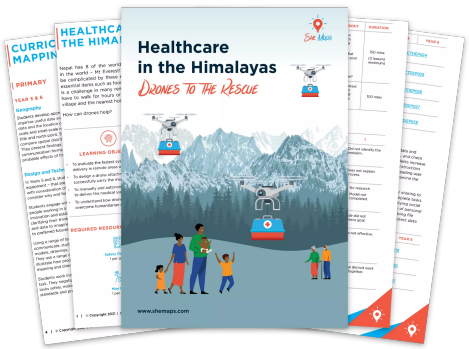
If you liked these activities, check out our microdrone teacher resources which provide teachers with Australian Curriculum mapped units of work, student activities, and teacher presentations. These are linked to real world learning, with industry partners supporting the development of the resources. A full unit of work for each resource is available in our Orbit membership.

Code, Fly, Deliver

Through short videos, the Swoop Aero team guides the students to follow five important steps to create their own drone delivery solution that solves a community need.

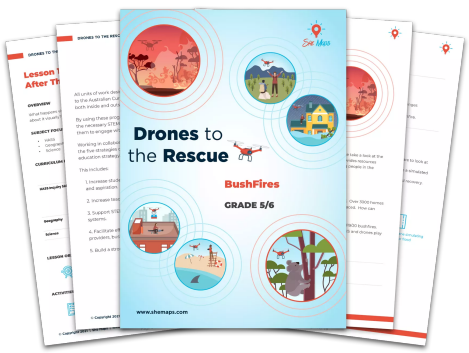
Healthcare in the Himalayas

Using the real world application of drone technology, with our partner Nepal Flying Labs, students will simulate the transport of critical medical supplies to remote villages in Nepal.



Drones to the Rescue

A series of units of work where drones and spatial data are used in Public Safety applications, including bushfires and floods.



Tournament of Drones

A fully developed inter or intra school event, with manual and coded flight activities and full event templates.

LEARN MORE

THANK YOU

This teacher resource has been brought to you by She Maps. We hope that you enjoy our resource, and you are excited for what we will release next!

We have a hard working education team spinning something up, but, to continue to pay them, we ask you to share our name.

We want everyone to have access to our resources, so by sharing who we are and where they can get our resources it helps us to support more teachers to be awesome!

So you can be the giver of good news, ask them to use this coupon code to grab 20% off any of our online resources - **FRIEND20OFF**

We're always looking for recommendations for topics or themes for drones and geospatial teaching resources. If you've got something in mind then please email us at programs@shemaps.com

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