



Drone Education Kit

Getting Started Guide

Get classroom ready with your
new Drone Education Kit



Instructions

With the Drone Education Kit students can program their own flight paths, capture amazing imagery and use virtual reality headsets to control their drone in first person! This set of instructions will assist in the setup of your kit and how to get started with your first Drone Education Kit.

Package Contents:

- 30/15 Ryze Tello Edu Drones
- 3/1 Multi Port Rapid Chargers
- 1 Pelican Case and Storage
- 120/60 Mission Pads
- 30/15 Charging Cables

Most Importantly:

Once you have received your Drone Education Kit, open up your kit and check that all items listed above are accounted for and without any physical defects. All parts of the Drone Education Kit will be activated and set up for your use, so all that is required is to switch on the drones, connect to your app of choice and be ready for lift-off!

Teacher Tablet Device:

1. Read the product safety docs below before you or your students use your drone kit
2. Download the 'Tello' app on your Tablet or smartphone
3. Connect each drone via WiFi
4. Test each drone
5. Download the 'Tello EDU' app on your tablet or smartphone
6. Start coding your drone to change the world!

*Please note there are several Tello apps in the Google Play store and App Store. Search 'Tello' to unleash the full potential of your Drone Education Kit!

Product Safety:

Drone safety is paramount, especially within the school environment. Please see the following documents which outline the risks, how to mitigate them as well as general safety information.

- [Risk Assessment](#)
- [Health & Safety Guidelines](#)

Pairing Drone Kits with VR/AR Education Kits:

Your new Drone Education Kit works fluidly with [Lumination's VR/AR Education Kits](#). As you require a tablet or mobile device to control, code and fly your drones, utilising the powerful capabilities of the Android devices of VR/AR Education Kits is a must. These high resolution Android devices harness the power of the Google Play store, the largest repository of Tello apps available. Most importantly, your drones have the ability to capture VR footage! Capture the VR video using your drone and view it through the VR/AR Education Kit VR headsets!

Helpful Links:

[Product Homepage](#)

[Tello](#) - App - Google Play/App Store (Free)

The original Tello apps allows you to free fly your drone, apply updates, calibrate flight settings and start to utilise the camera. This app is the first port of call when powering up drones and test flying.

[Tello EDU](#) - App - Google Play/App Store (Free)

Tello EDU takes your drone to the next level. This app harnesses the power of coding and is designed for the school environment. With extensive tutorials and virtual testing, this app teaches your students how to block code, test and then fly your drone within the capabilities of your school environment. This app is your one stop shop for learning drone flight and coding!

[Droneblocks](#) - App - Google Play/App Store (Free)

Droneblocks is a secondary coding app that is functional with the Tello EDU drone. This also teaches the ability to script code on your PC using the [Drone Education website](#). Enrol your students for easy and simple coding lessons!

[Tello FPV](#) - App - Google Play/App Store (Paid)

Tello FPV is the premium app for Tello control. It allows your students to delve deeper into drone control and functionality. While it is a paid app, it can take your students drone flight to new heights!

For further support, please contact our Technical Specialist, Mark Cooper.

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Partner

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Pedagogy Guide

Explore New Heights

with your Drone Education Kit

Congratulations on your purchase of a Lumination Drone Kit! Watch as your students' design thinking skills take off and their understanding of the world around them soars with these engaging educational drones.

The Drone Kit can be used across the curriculum for all sorts of inquiry learning tasks - from investigating angles in mathematics, recording and analysing performances in sport and drama, to creative storytelling in arts and language lessons. The Drone

Kit is an especially innovative and exciting tool for developing students' process and production skills across the Digital Technology and Design and Technology curricula, and is well suited to teaching coding skills in a real-world context.

This guide is designed to support educators to use their new Drone Kits in meaningful and pedagogy driven ways, and is split into three sections:

Preparing to Pilot, Production and Flight, and Assessing and Reflecting.



Preparing to Pilot

Production and Flight

Assessing and Reflecting



Preparing to Pilot

1. Considering Safety

There is a bit of preparation required before lift off, and getting your students involved at this early stage is a great way to help them develop not only their critical thinking skills but also an appreciation of the technology they're about to use. Working as a class to identify risks involved in using the drones and agree on steps that everyone will take to keep each other safe helps students understand the purpose and importance of the rules, and increases their self-efficacy when approaching similar situations in future.

2. Connect to the Real World

While the drones naturally lend themselves to tasks such as coding and simple video recording, this is only the tip of the iceberg. Embedding drone use within a real-world scenario can not only open up educational opportunities but also increase engagement both through use of an exciting technology and also through fostering student appreciation of real-world applications for the skills they are developing. For example, set up a simple obstacle course simulating a farm environment, and have students decide how best to use their drones to apply fertiliser to target areas. You can set your students broad challenges to stimulate their critical thinking - e.g., 'apply fertiliser using the best method you can' and have students plan and justify their choices, or you can set your students challenges that target specific skills and knowledge, e.g., apply fertiliser using the fastest method (e.g., travelling salesperson problem), apply fertiliser with no reuse of paths (e.g., Euler circuit) or using the smallest number of lines of code.

3. Articulating Problems and Designing Solutions

Design Thinking is a useful technique for approaching a whole range of topics, and connects particularly well to the Process and Production Skills space in both the Design and Technology and Digital Technologies curricula. Using Design Thinking, students gain a deep understanding of their real-world problem and then use this understanding to define the problem and any requirements and constraints. Once the problem has been well articulated, students can begin ideating using techniques such as sketchstorming, options explosions, and jotting down snippets of pseudocode, and then select their best idea to implement.



Production & Flight

1. Implementing Solutions

There are two key ways to control your drones – either using remote control, or through writing code. For predictability, efficiency and safety, we are big fans of having students code their solutions, regardless of whether the subject area is specifically STEM focused. Students can then test in virtual reality to confirm the code behaves as expected, and only once all the wrinkles are ironed out do students deploy their code to the real drone. An additional benefit of this approach is that it encourages students to critically assess their own work as they go, which is a great skill in general. It also fosters best-practice approaches to code development, whereby students implement, test and refine only a small ‘unit’ of drone behaviour at a time, and gradually build up to their big picture solution. This ‘one bite at a time’ approach makes identifying and fixing problems much easier than it is when students try to implement their whole solution in one go!

2. Testing and Iterating

Once students deploy their code to their drone, they may encounter issues that were not picked up during virtual testing. This is to be expected, and opens up a great opportunity for discussing ‘theoretical’ versus ‘real-world’ considerations. How does the drone cope with air movement from a fan or the wind? Are there additional obstacles or constraints that weren’t initially noticed? What happens when the drone’s battery starts to get low? Exploring these situations helps students to recognise and account for similar issues in future.

The Design Thinking methodology, like any engineering or development life-cycle, is more cyclical than linear. For this reason, try to allow time in your lessons for students to revisit their solutions and adjust them after the initial deployment. Learning how to iterate from an initial design to a refined and robust solution is not only satisfying, but can help students to build resilience and recognise their own potential as skilled problem solvers.



Assessing & Reflecting

1. Assessing Solutions and Communicating Ideas

Once students have completed their solutions, the next logical step is assessment. Self and peer assessment can be useful tools in developing communication skills, critical thinking and metacognitive skills, and encouraging students to be realistic and honest in their assessments will support their future self-efficacy and resilience. Some good techniques to ensure feedback is both helpful and tactful include 'TAG feedback', 'traffic light feedback' and 'I like, I wish, what if'.

2. Recognising Growth and Identifying Skills to Learn

The conclusion of your students' drone experience is a great opportunity to get them to reflect on their own learning processes. Help students to identify what skills they have developed, what skills they'd like to learn next, and in what ways they have grown - perhaps this was a chance for a student to shine as a team leader, or speak up when they are usually a quiet achiever; perhaps they're aware of some new technical skills, or were persistent in the face of challenges. Drones are a fun and engaging way for students to not only learn new technical skills and design thinking techniques, but also to develop their transferable skills and nurture their confidence and identity as a capable problem solver, setting them up well for lifelong learning.

Thank you for Reading.

For more resources, visit our [website](#).



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Sparking the lightbulb moment.

For further support, please contact our Technical Specialist, Mark Cooper.

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