

INSPIRE STEAM

TERM 1 GRADE 4

(i) Mission, Pilot Guide, and Printables

(i) R L



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CREATED

for teachers,
by teachers

INFORMATION ABOUT (i)RL

STEAM education forms the future of education and inspires the youth to develop 21st-century skills; for employment opportunities that might not even exist yet. As teacher's, we are the revolutionaries to become this inspiration and require some extra tools to help on the journey. Using the Inspire Africa (i)RL package, we hope to help provide these tools.

Here is some additional information to help you understand how (i)RL could assist you and the guidance it could provide:

- An (i)Mission provides the teacher with a STEAM lesson that includes a real-world challenge activity for the learners.
- This challenge-activity will allow learners to use subject knowledge, together with Tello drones, to engage in a learning experience. The core focus of this activity will be to address a real-world problem.
- An (i)Mission provides a platform for teachers and learners to collaborate across different subjects.
- Using this (i)Mission takes an interdisciplinary approach to learning. It helps learners make connections that form critical thinking skills; by redefining problems outside of normal boundaries and reaching solutions based on a new understanding of complex situations.
- Each hyperlink for additional resources is in **bold** and underlined for convenience, therefore do hover your mouse over the text to find additional videos or informational websites for your classes.
- A **Pilot Guide** is provided for learners, and it accompanies the teacher's (i)Mission, which may be printed as a handout. This guide also provides resources for the learner to take agency over their own learning.
- A **Safety Rules** is provided that teachers could use to ensure safety measures are enforced when using drones or technology within the class.

It is important to note that this is a trial package for our pilot schools, and we hope to iron out any problems that these lessons could present. Therefore, if you have any further suggestions, tips, and informational feedback to give – do not hesitate to contact Inspire Africa's Learning Experience team at learningexperience@inspire.africa.

We hope you can inspire our future leaders with our content and help us to become part of the (R)evolution of education.



(i)Mission Food relief mission



| INSPIRE STEAM | | | | |
|--------------------------|---|--|---|--|
| Lead Subject(s) | Geography | Resources & Equipment | Provided by Inspire Africa | Teacher Sourced |
| Collaboration Subject(s) | <ul style="list-style-type: none">• Mathematics• Natural Sciences | | <ul style="list-style-type: none">○ This (i)Mission guide○ Landing pads○ Pilot guide for learners○ Additional links○ Tello drones | <ul style="list-style-type: none">○ Paper clips○ String○ Cones and desks (items to simulate and mimic obstacles during flight execution)○ Coloured tape |
| Suggested timeframe | 4-5 hours | | | |
| CAPS Alignment | Subject-specific themes or topics | | | |
| | Social Sciences (Geography) | Mathematics | Natural Sciences | |
| | <ul style="list-style-type: none">• Places where people live (settlements)<ul style="list-style-type: none">○ Landmarks and explaining the way• People and their needs | <ul style="list-style-type: none">• Shapes<ul style="list-style-type: none">○ Square○ Cube○ Construction of nets | <ul style="list-style-type: none">• Life and Living<ul style="list-style-type: none">○ What plants need to grow | |

| Driving (i)dea | |
|---|--|
| Drones can assist in delivering packages to remote areas. | |
| Real-World Problem | Aim |
| <ul style="list-style-type: none"> In South Africa, we may have access to food or farm our food, but several factors, including natural weather disasters such as drought and floods, can lead to a drop in the supply of food, especially in rural areas, where farmers rely on natural weather patterns to farm food to supply the local community. Some rural areas are not easily accessible by vehicle, and we need to consider alternative methods to offer relief support. | <ul style="list-style-type: none"> To explore the use of technology in solving a food shortage problem. This (i)Mission will lead to a challenge that requires learners to code a drone to fly to a settlement to deliver a food parcel. |

| Introduction to (i)Mission | | |
|-------------------------------|---|---|
| (i)Mission Teacher's Notes | <ul style="list-style-type: none">• The introduction to the (i)Mission is aimed at creating interest among learners. Learners are encouraged to collaborate on ideas, ask questions and explore any thoughts during the process.• The learner will create a cube-shaped food package and attach it to a Tello drone. They will then be required to code a drone to fly in a square shape to a rural area, land safely to deliver the food package, and return.• Learners are making real-world connections by learning about plant health in Natural Sciences while constructing a cubed food parcel and learning about squares in Mathematics.• The understanding of the direction in Geography assists them in being able to complete a mission to program the delivery of a package via drone technology, to assist a community with food relief. | |
| | (i)Mission details | |
| Steps | Description | Resources |
| 1 | <ul style="list-style-type: none">• <u>What do plants need to grow?</u> Create a mind map.• What is a food shortage? <u>An explanation</u>• Explore reasons for food shortages.• Offer inquiry time for learners to collaborate on discovering possible ways to assist communities in gaining access to food using any form of technology.<ul style="list-style-type: none">◦ Learners can brainstorm ideas. Encourage the use of mind maps. Allow them to share their ideas with the class.◦ Learners must consider limitations such as weather conditions, geographical locations, distances, fuel usages, costs, etc.◦ Encourage learners to consider all real-world options and include any innovative ideas of how technology could be used. New farming methods that do not rely on natural weather patterns can also be explored e.g. indoor hydroponic systems. | <u>Website on food crisis and famine with articles</u> (use teacher discretion) |



(i)Mission



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| 2 | <ul style="list-style-type: none"> • Watch the following news clip link on how drones have been used to distribute urgent medical supplies to remote areas: • Revert to the problem and aim. Discuss expectations with learners. • (Mathematics lesson) Explore polyhedron shapes that could be used to create parcels to deliver a food package to a remote area. | |
| 3 | <ul style="list-style-type: none"> • Construct a cube from the net provided in the Pilot guide. Allow learners to construct on their own. • Provide learners with fastening equipment like string and paper clips to explore ways to attach the cube to the Tello drone. • The cube will represent the package that they deliver | Top 10 heavy lifting drones |
| 4 | <ul style="list-style-type: none"> • Execute the (i)Mission. | DroneBlocks: Box Challenge |
| Additional resources | <ul style="list-style-type: none"> • Polyhedron shapes website • 3D nets website – with examples of polyhedron nets • Wild tomorrow fund website – Current organization that delivers food packages. • News article on flood devastation (2018) (use teacher discretion when showing the site to learners) • Drone inspiration – Drone pulling a surfer shows heavyweight carrying ability | |

(i)Mission Execution

| (i)Mission | Description |
|---|--|
| <p>Deliver a food package to a remote community in the Cederberg mountains.</p> <ul style="list-style-type: none"> • The community has suffered tremendous damage during a flood storm which has damaged all their crops. • There is no way at this point for any person to safely travel into a town to buy food. • There is also no vehicle access. • They need your help to deliver a food package with basic food supplies in them. | <ol style="list-style-type: none"> 1. In this mission, the learner is required to code the Tello drone to fly in a square shape. 2. Additional resource: DroneBlocks: Box Challenge 3. Allow learners time to code their drone to fly in a square shape. <ul style="list-style-type: none"> • Remind learners that a square has four equal sides and four equal angles each at 90-degree angles. • Instruct learners to program each side of the square shape to be 2m long, if space allows. • Choose a location along with the square flight plan to land and deliver the food package, perhaps midway through one of the square sides. Identify and provide guidance on the location. • Provide learners time to detach the package. • Program drone to take off again and continue flight home. 4. Additional lesson ideas could be for the teacher to place an obstacle in the middle of the class to mimic extreme weather conditions or use cones to simulate hazardous areas or mountains. A desk could be strategically placed at the start/home point, and at the delivery point. Below is a setup image a teacher can use in the class. 5. Allow learners to trial and error until they execute the iMission successfully. 6. Extension: Fly a Tello drone and deliver an item to a teacher in another classroom. |

Flight Plan

Below is an example of a classroom setup that could be used to simulate the environment when learners execute their mission.

- Use desks/ landing pads as start and delivery points.
- Cones can be used as mountain ranges.
- Teachers can become even more creative by building models in art classes or suspending items from the roof to mimic extreme weather.
 - An example of this could be cottonwool clouds with lightning bolts to mimic a heavy storm.
- Use coloured tape on the floor to indicate the lines (indicated as flight plan on image) that the drone is required to follow.

Figure 1 (below): Depicts the classroom mock-up of a flight plan for a drone. The drone's route is to fly in a square of two meters by two meters to reach a delivery point. It would have to navigate around the mountain ranges as well as extreme weather conditions.



(i)Mission

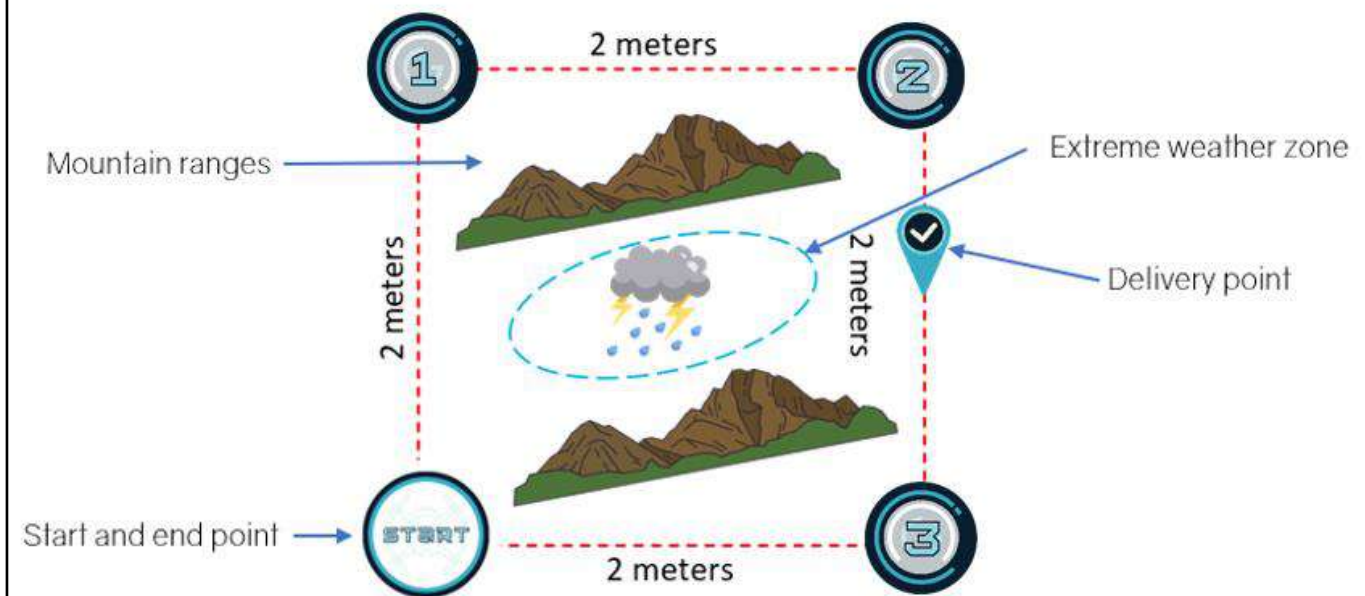


Figure 2 (below): Code for (i)Mission.

