DRONE ODYSSEY CHALLENGE 2019

COMPETITION ANNOUNCEMENT

22 APRIL 2019 @NEWTON ROOM

Content

1. **Overview of Drone Odyssey Challenge**
   - Background
   - Categories/ Stages
   - Competition Schedule
2. **Categories/ Gameplay**
3. **Learning Journey**
   - Workshops
4. **Resources**
   - Registration
   - Drone Kits & Accessories
   - Student/Teacher Packages
5. **Q & A**
   - Questions & Answers

OVERVIEW

Background

- An exciting game-based competition that promises plenty of fun while inculcating technical skillsets, critical thinking and an appreciation of new and disruptive technologies relevant to the modern world.
- Open to primary and secondary students, this competition will see participants working together to code their programmable drones to performing a series of tasks relevant to the challenges.
- The competition is organised by Science Centre Singapore with support from the Ministry of Education (MOE) and various partners.

Categories/ Stages

Main Category	Sub-Category	Allowed Drone	Education Level	Stages
Category A – Coding with Drones	Category A1	Parrot Mambo	Primary Schools	Preliminary Rounds and Finals
	Category A2	DJI Tello Edu		
Category B – Coding with Drones	Category B1	Parrot Mambo	Secondary Schools	Preliminary Rounds and Finals
	Category B2	DJI Tello Edu		
Open Category – Drone Swarming	Open Category	DJI Tello Edu	Secondary Schools	Finals

*Each team should consist of **TWO (2) to THREE (3)** Members.*

Competition Schedule

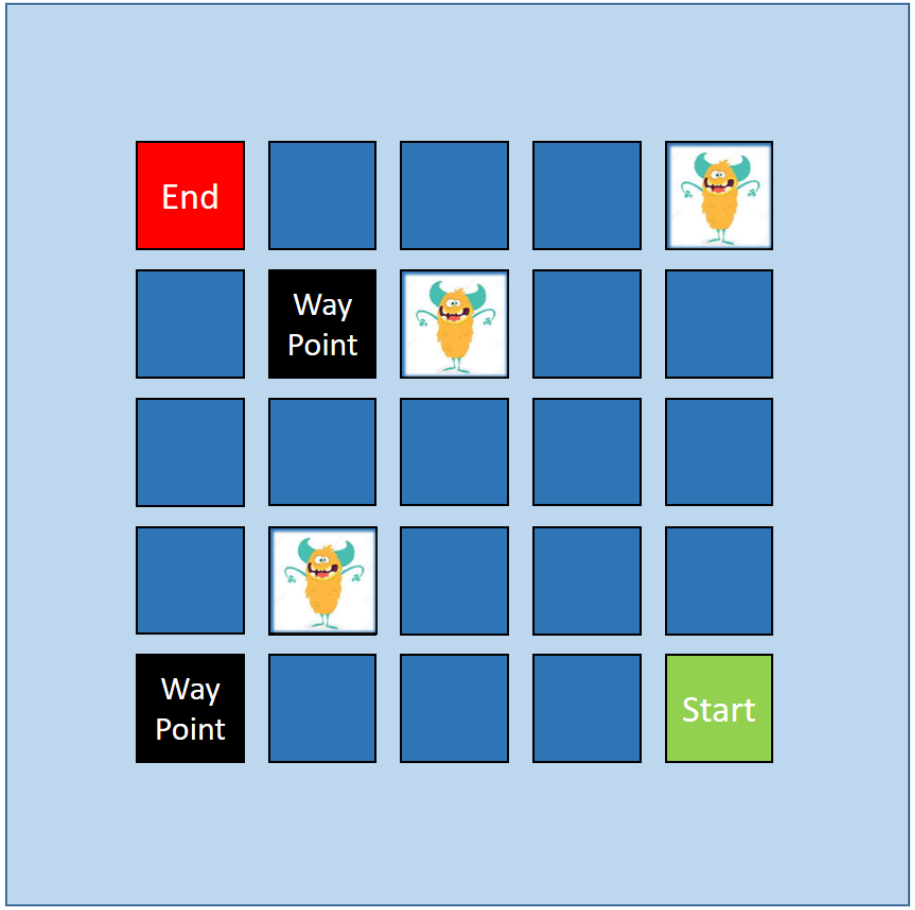
DATE	EVENT	VENUE
8 April 2019	Registration Opens	
22 April 2019	Challenge Announcement	Science Centre Singapore
31 May 2019	Registration Closes	
9-11 July 2019	**Category A Preliminaries** **Category B Preliminaries** **Open Category**	Science Centre Singapore
12 July 2019	**Category A Finals** **Category B Finals** Awards Presentation Ceremony	Science Centre Singapore

CATEGORY A

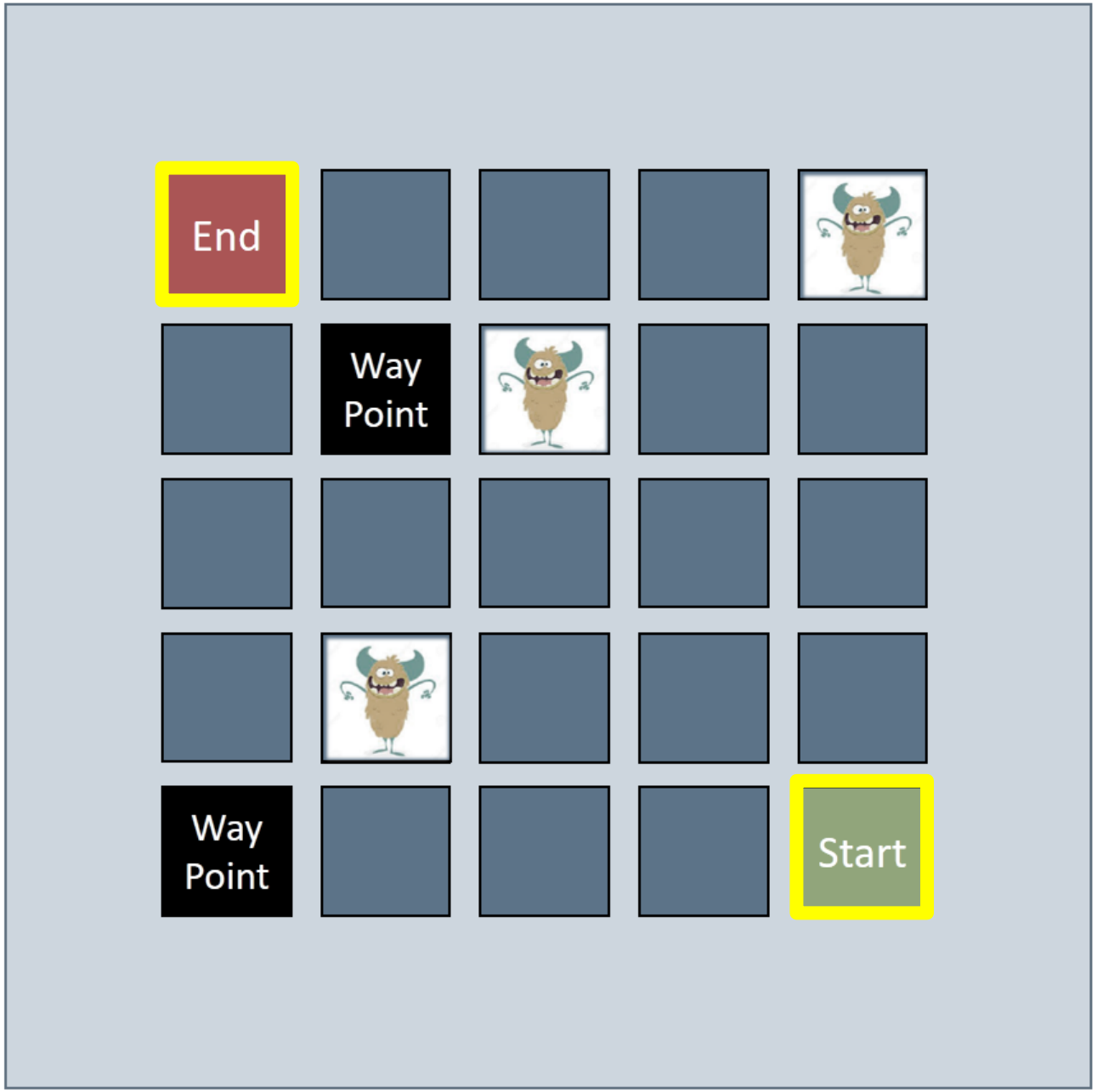
PRIMARY SCHOOL

Preliminary Round

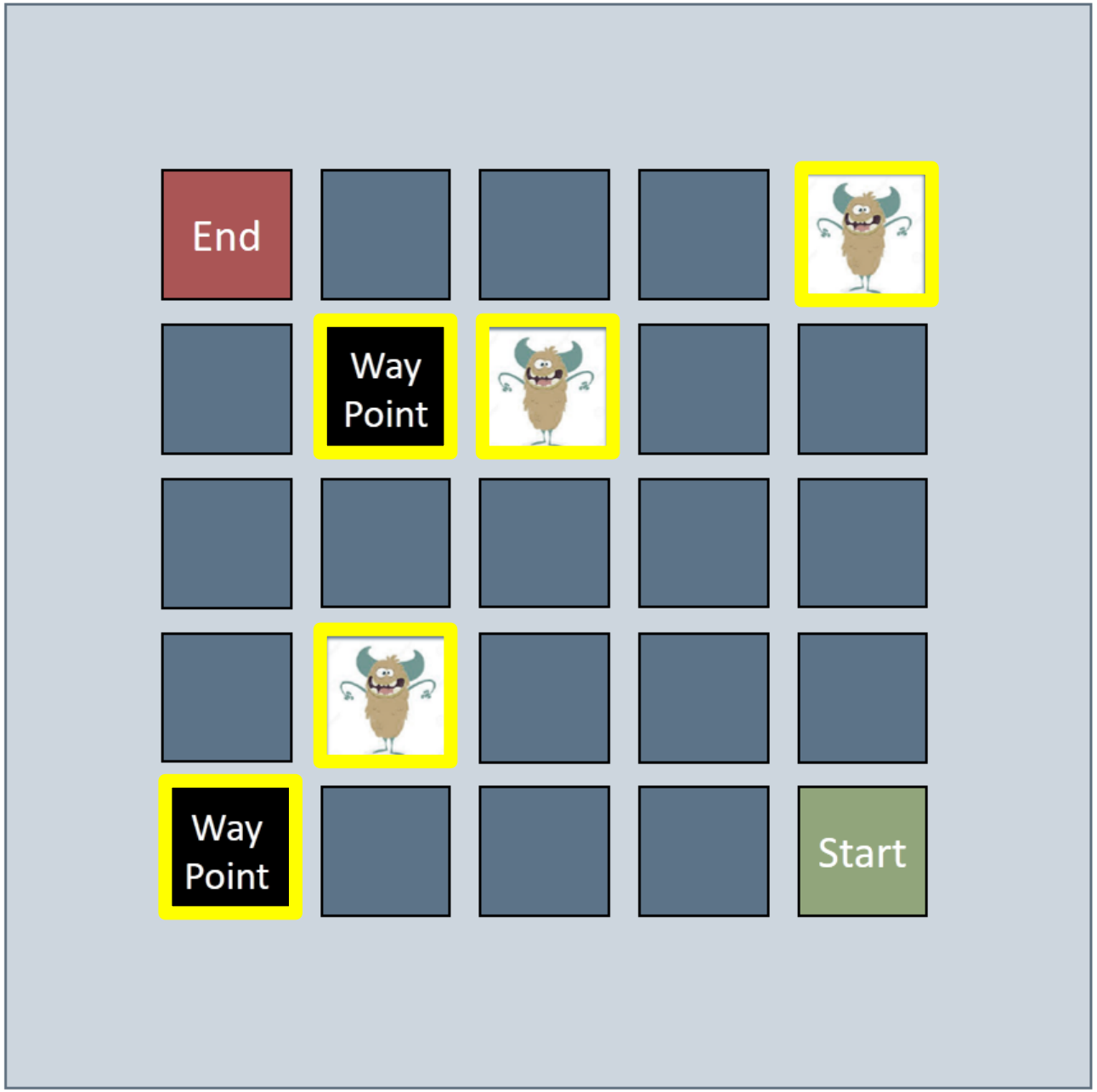
- There are monsters within the forest.
- Your drone is to fly continuously over waypoints in the forest and determine if there are monsters hiding at each waypoint.
- The more waypoints correctly visited and number of monsters identified will allow the team to score more points.



- Team to start at the “Start” tile and end at the “End” tile.



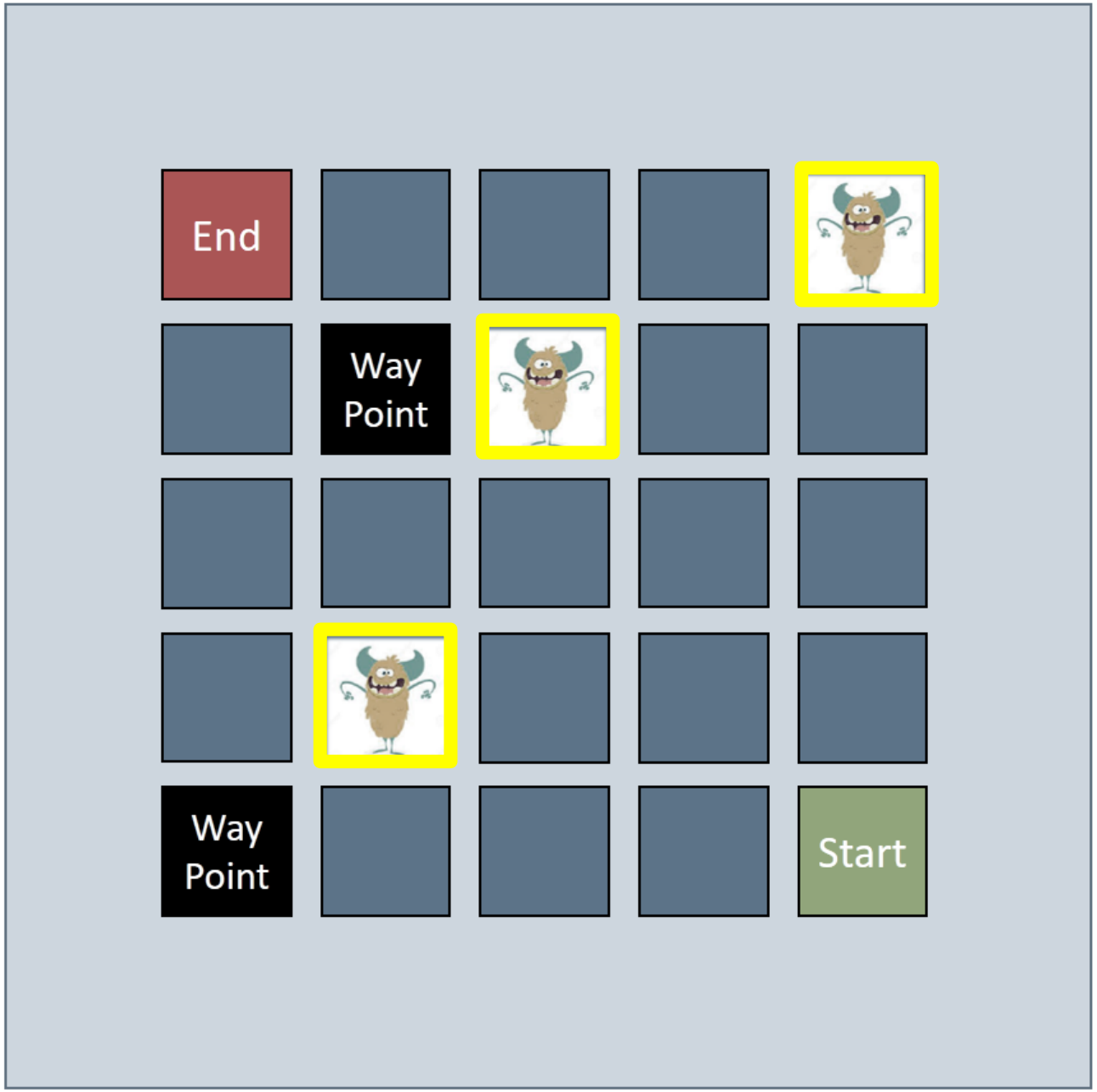
- 5 waypoints to visit.
- Teams may visit the waypoints n any sequence in between.
- These waypoints will only be made known before each run.
- These waypoints will be consistent for all teams doing the run.



- Up to 3 monsters may occupy any of the waypoints

- Location of the monsters will only be made known before each run.

- Location of the monsters will be consistent for all teams doing the run.



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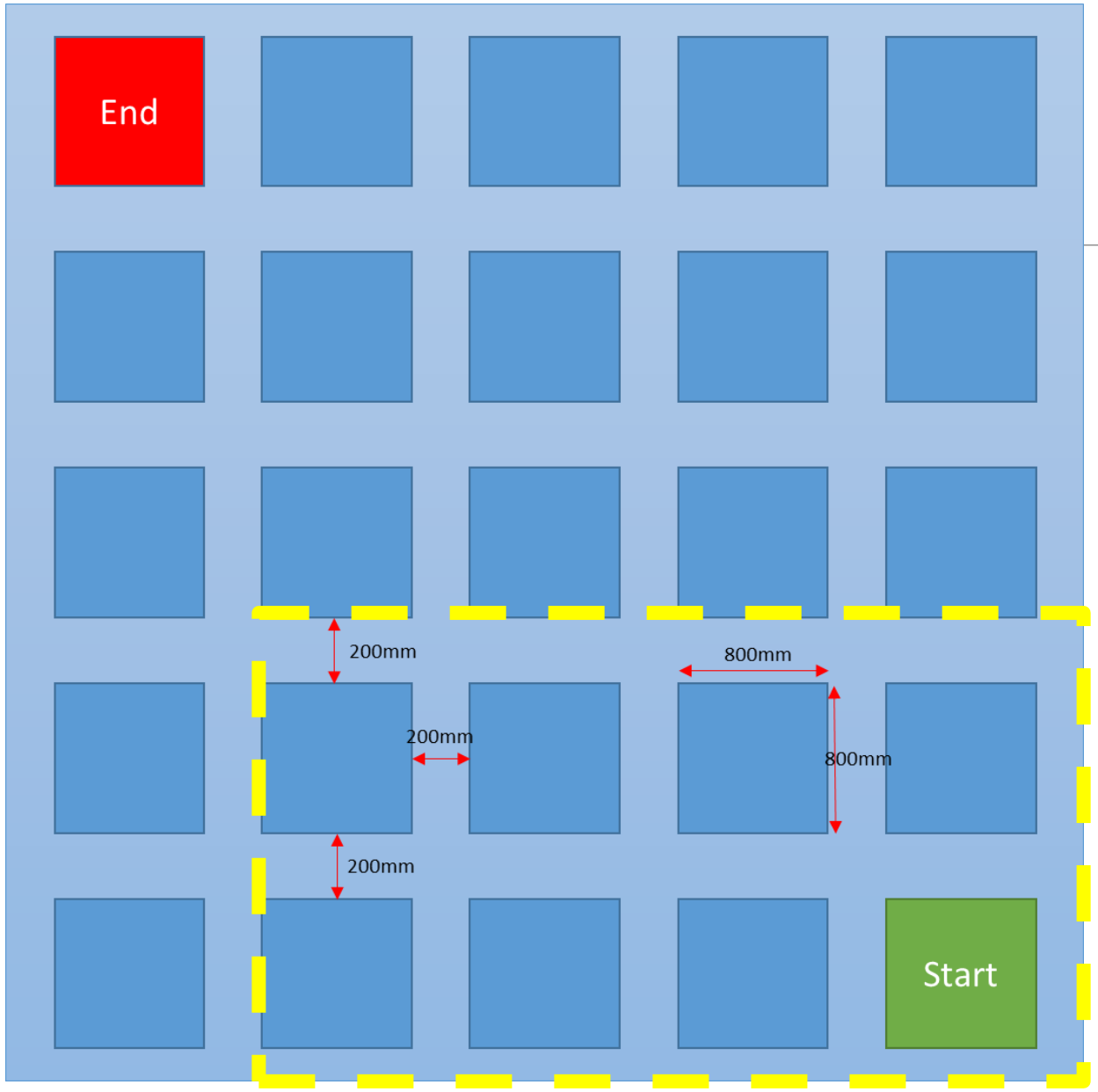

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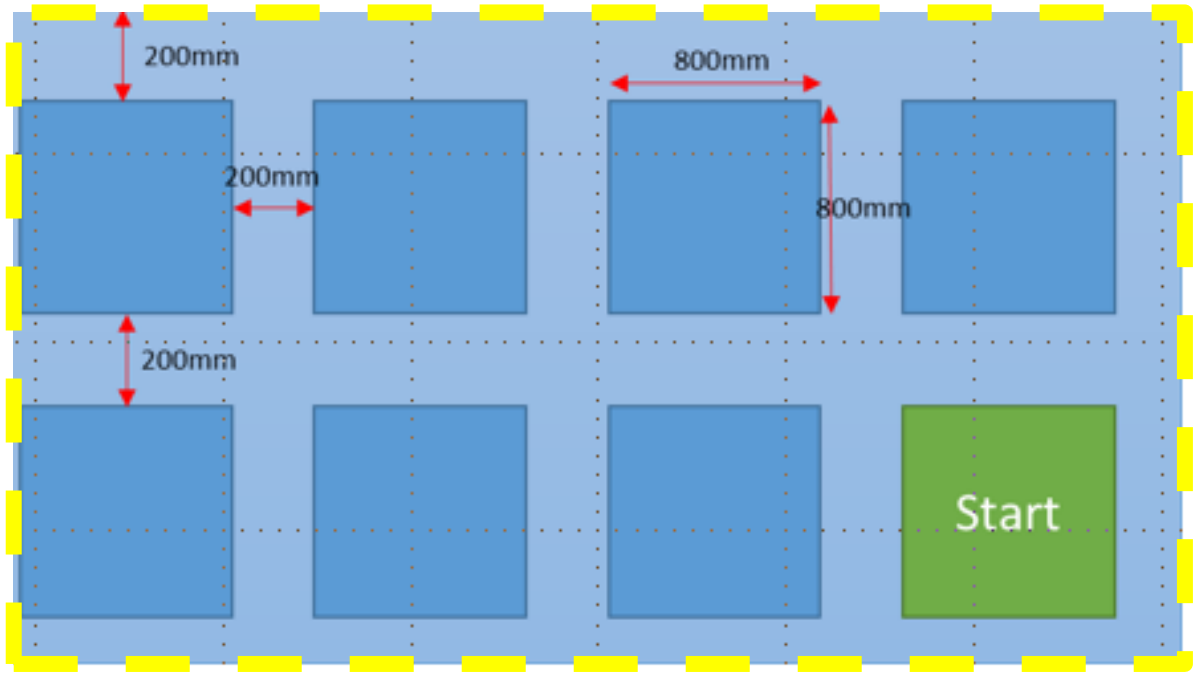


Sub-Categories

- **Category A1**
- Parrot Mambo
- Programming Language: Tynker, Apple Swift Playground, Workbench

- **Category A2**
- DJI Tello Edu
- Programming Language: Python, Apple Swift Playground

Category A1

- Teams are to take a picture at each way point visited as proof of having visited the way points.

- Total time of 10 minutes
  - Code and autonomously navigate drones to each of the waypoints in any sequence the team may prefer
  - Timing will start when the team is given instruction by the Referee to start coding.
  - Autonomous flight can start any time after during the 10 minutes given

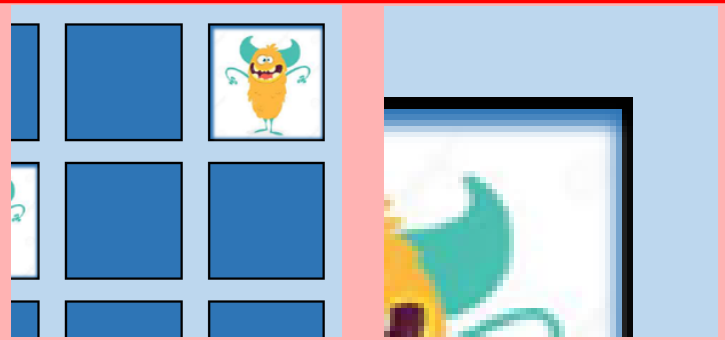
- Team need to hover and stabilise the drone sufficiently to take a picture of the way point using the drone's vertical camera.

Category A1

- The picture taken is considered valid as long as it is sufficiently clear to identify the way point visually and covers over 50% of the frame of the picture.
- For example,

Acceptable

Covers >50% of Picture



Not Acceptable

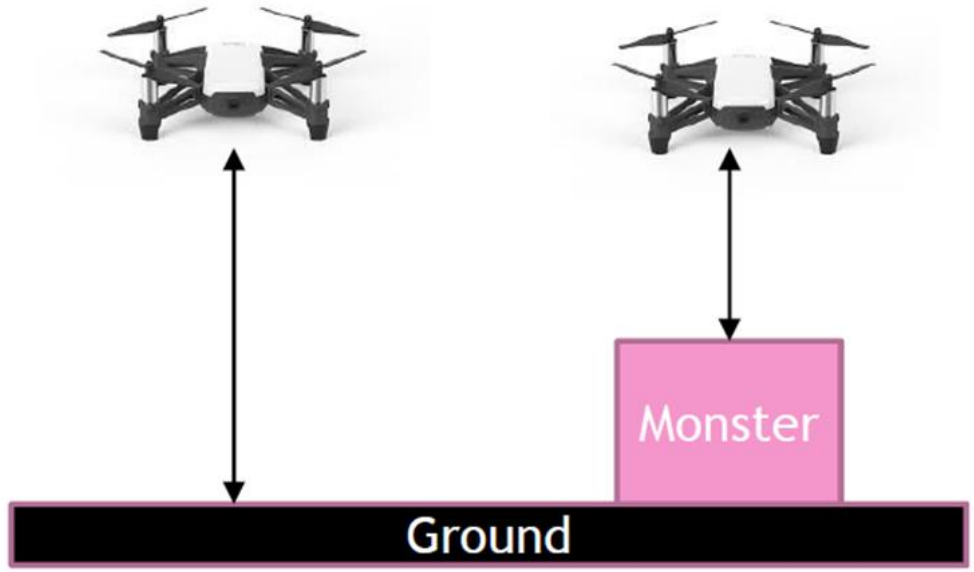
Covers <50% of Picture. Drone is off target or flying too high above the tiles.

Category A2

- Teams are to visit each way point
- Teams to report to referee the number of monsters visually identified and their respective locations on the grid
- Total time of 10 minutes
  - Code and autonomously navigate drones to each of the waypoints in any sequence the team may prefer
  - Timing will start when the team is given instruction by the Referee to start coding.
  - Autonomous flight can start any time after during the 10 minutes given

Category A2

- There will be mission pads located at each waypoint. A waypoint is considered to have been visited if the mission pads were detected.
- Teams are then to use the DJI Tello's TOF data to ascertain if a certain waypoint has a monster.
- Monsters are represented as a platform that is higher than its surrounding. Teams are then to report to the referee the number of monsters detected and their locations.

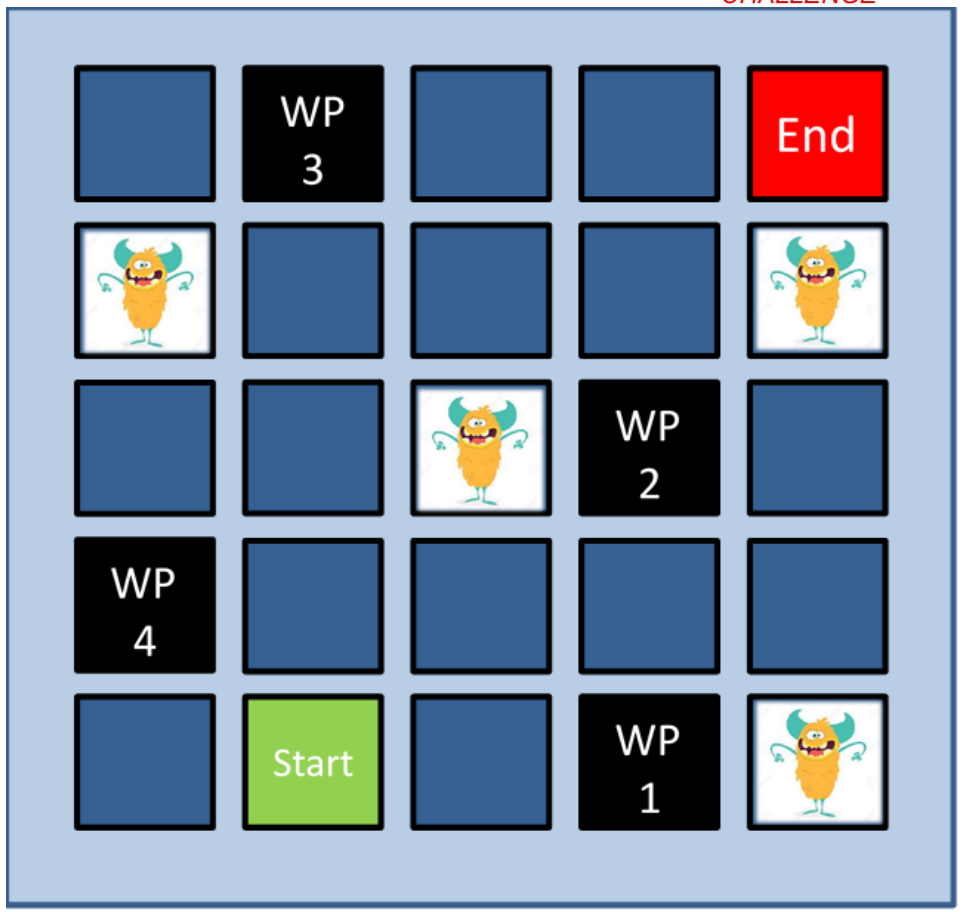


CATEGORY B

SECONDARY SCHOOLS

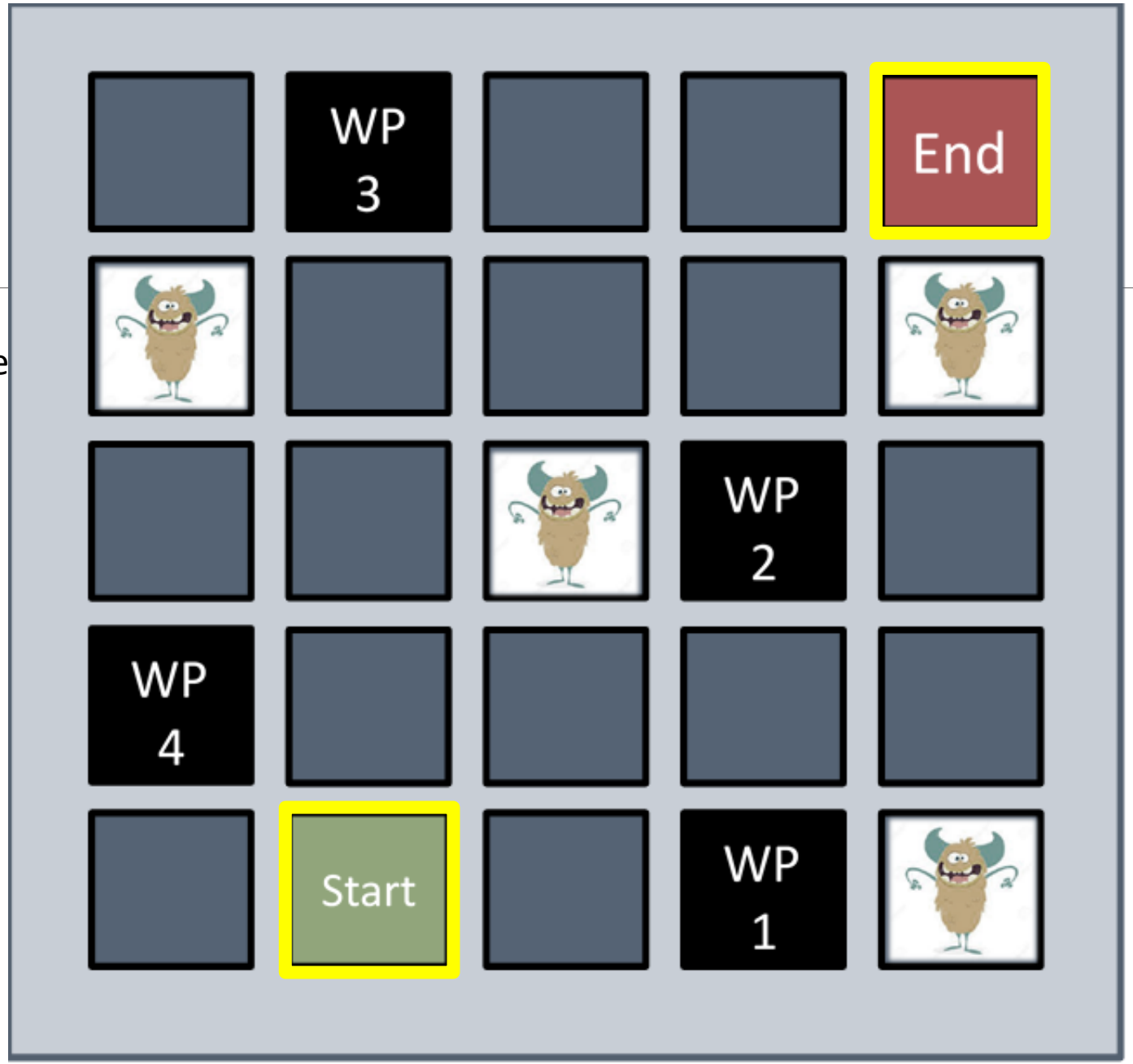
Category B1

- There are monsters within the forest.
- Your drone is to fly continuously and autonomously over waypoints in the forest while avoiding monsters in its vicinity.
- Teams should do a reconnaissance flight first to determine the locations of the waypoints and monsters before planning the fastest and safest route through all waypoints.



- Team to start at the “Start” tile and end at the “End” tile.

- The location of these two tiles will also be determined only at the start of each run.



DRONE ODYSSEY CHALLENGE

- There are 4 waypoints to visit.

- These waypoints will only be made known before each run and will be consistent throughout each run for all teams.

DRONE ODYSSEY CHALLENGE

- Any number of monsters may occupy the vicinity of the waypoints.
- Teams are to code for their drones to avoid running into them as penalties will result.
- The team who visits the most waypoints in the shortest time with least penalties wins.

DRONE ODYSSEY CHALLENGE

Sub-Categories

- **Category B1**
- Parrot Mambo
- Programming Language: Tynker, Apple Swift Playground, Workbench

- **Category B2**
- DJI Tello Edu
- Programming Language: Python, Apple Swift Playground

Category B1

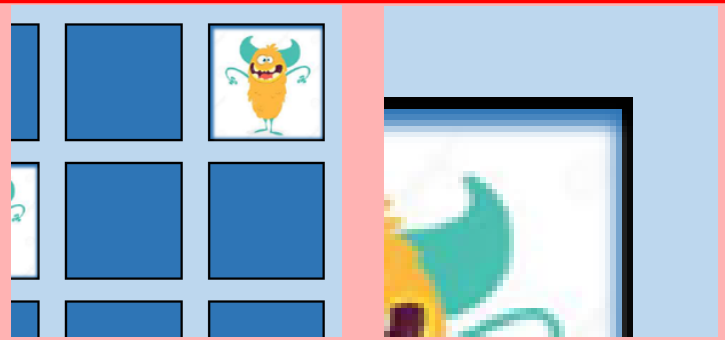
- Teams are to first do a reconnaissance flight and take pictures of the whole forest to determine the locations of the waypoints and monsters.
- Teams to plan a route to visit each waypoint in sequence.
- Teams are to take a picture at each way point visited as proof of having visited the way points.
- Total time of 10 minutes
  - Code and autonomously navigate drones to each of the waypoints in any sequence the team may prefer
  - Timing will start when the team is given instruction by the Referee to start coding.
  - Autonomous flight can start any time after during the 10 minutes given
- Team need to hover and stabilise the drone sufficiently to take a picture of the way point using the drone's vertical camera.

Category B1

- The picture taken is considered valid as long as it is sufficiently clear to identify the way point visually and covers over 50% of the frame of the picture.
- For example,

Acceptable

Covers >50% of Picture



Not Acceptable

Covers <50% of Picture. Drone is off target or flying too high above the tiles.

Category B2

- Teams are to first do a reconnaissance flight and take pictures of the whole forest to determine the locations of the waypoints and monsters.
- Teams to plan a route to visit each waypoint in sequence.
- Teams are to take a picture at each way point visited as proof of having visited the way points.
- Total time of 10 minutes
  - Code and autonomously navigate drones to each of the waypoints in any sequence the team may prefer
  - Timing will start when the team is given instruction by the Referee to start coding.
  - Autonomous flight can start any time after during the 10 minutes given
- Team need to hover and stabilise the drone sufficiently to take a picture of the way point using the drone's vertical camera.

Category B2

- There will be mission pads located at each waypoint. A waypoint is considered to have been visited if the mission pads were detected.
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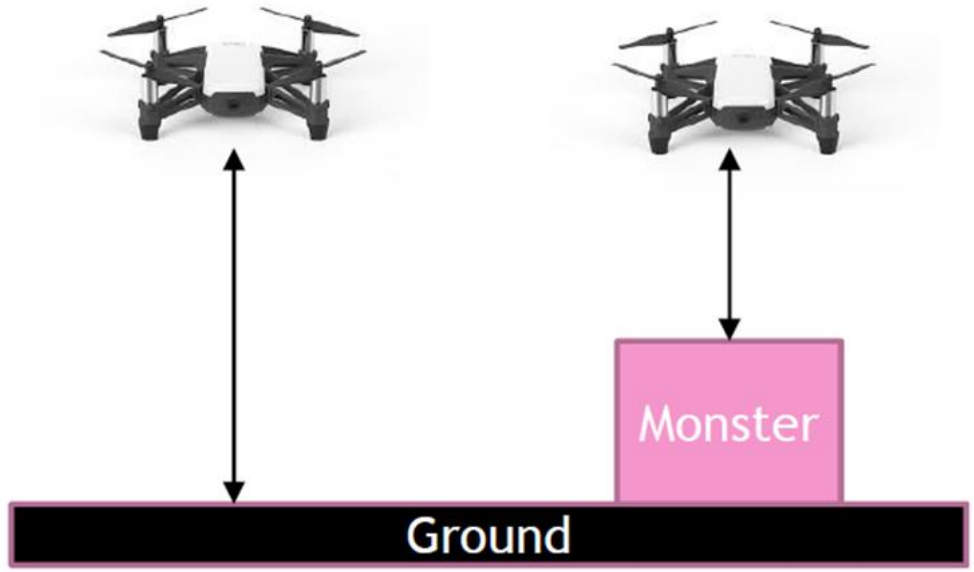

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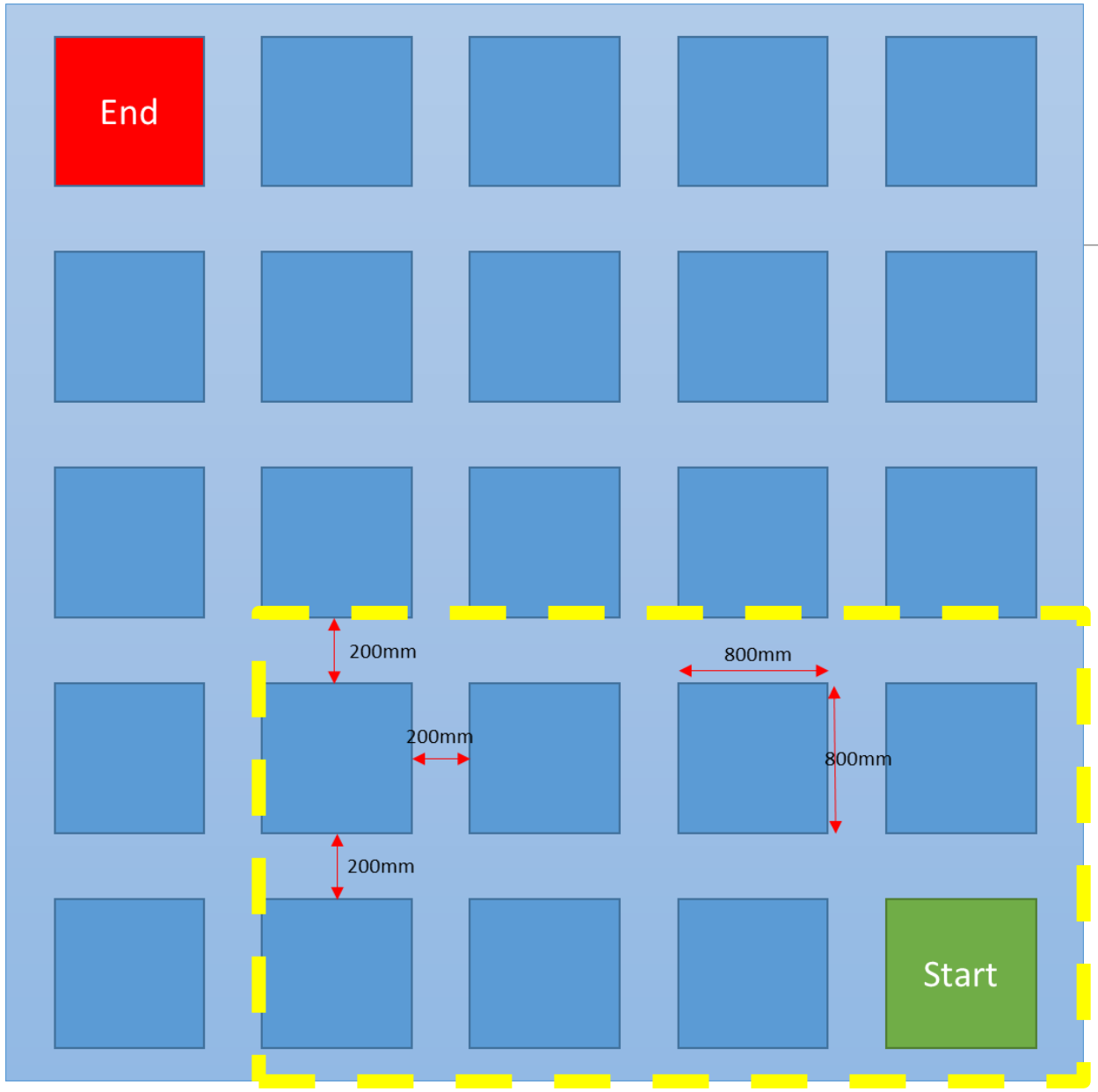

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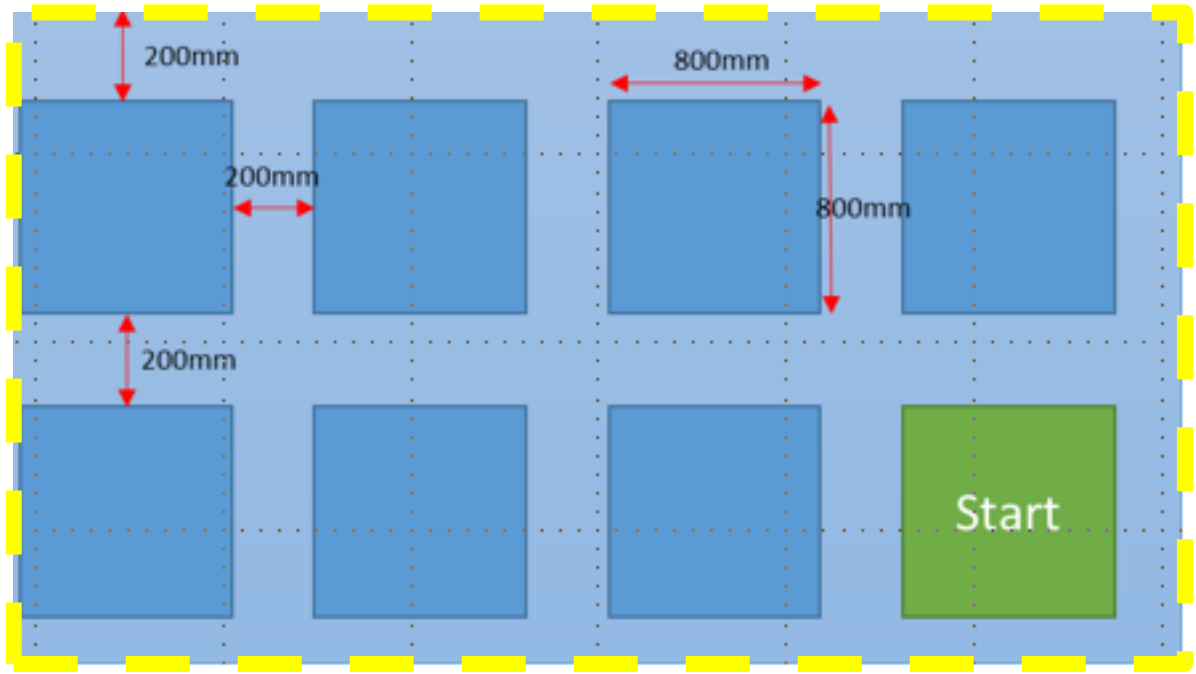

OPEN CATEGORY

(new category)

SECONDARY SCHOOLS

Open Category

- Open category introduces the concepts of autonomous drone swarming.

- As we celebrate the 200th year founding of Singapore, students are to choreograph a drone swarm showcase, with minimum of **THREE (3)** DJI Tello Edu drones

- The drone swarming showcase should be within **TEN (10)** minutes. Teams are to program, setup and perform the showcase within **THIRTY (30)** minutes

- Teams are to program, setup and perform the showcase in front of a panel of judges who will be judging the performance based on the following aspects:
  - Technical merits: Execution, synchronization, difficulty and technical
  - Artistic impressions: Choreography, music interpretation, manner of presentation

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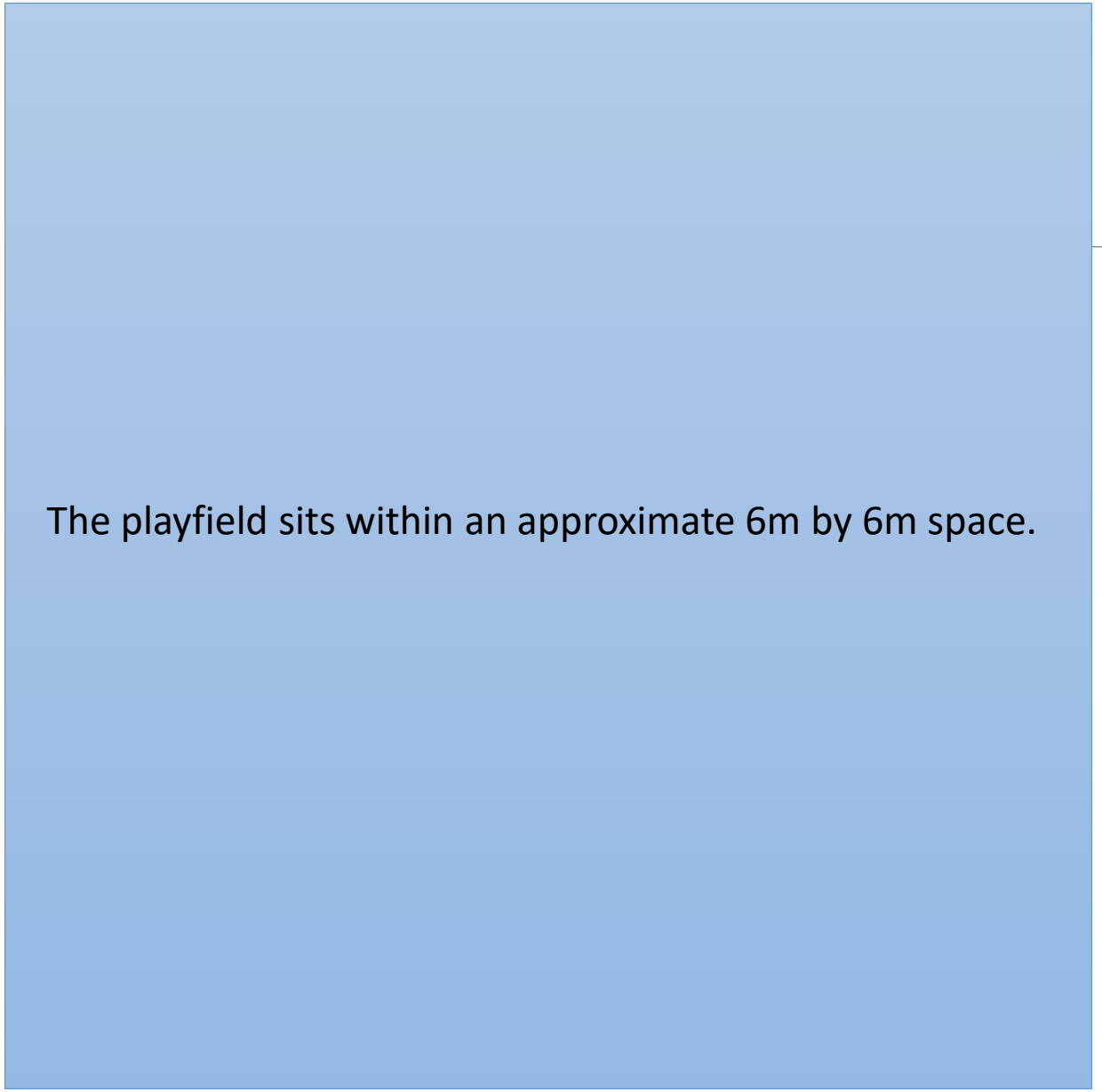

The playfield sits within an approximate 6m by 6m space.

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Open Category Preparations

- Teams are to submit a proposed flight routine, submit their song(s) of choice for the routine and a high quality video of their full test flight to the organizers at least 1 week before the competition.
- The judging panel may use the high quality video as basis for judging should teams run in to technical difficulties on the actual competition day.
- Teams may also prepare and use additional props or add attachments/payload to their drones to enhance the performance.
- However, teams need to ensure that the attachments/payload do not affect the performance or integrity of the drones.

The drone swarming showcase should be within **TEN (10)** minutes. Teams are to program, setup and perform the showcase within **THIRTY (30)** minutes.

AWARDS

CHALLENGE AND MERIT

Challenge Awards

CATEGORY A AND B

Awards	Prizes
Champion	$500 Cash and Championship Trophy, Winner Medals/ Sponsored Products
1st Runner-up	$400 Cash and Winner Medals/ Sponsored Products
2nd Runner-up	$300 Cash and Winner Medals/ Sponsored Products
3rd Runner-up	$200 Cash and Winner Medals/ Sponsored Products
4th Runner-up	$100 Cash and Winner Medals/ Sponsored Products
FIVE (5) Consolation Awards	Winner Medals/ Sponsored Products

OPEN CATEGORY

Awards	Prizes
Champion	$500 Cash and Championship Trophy, Winner Medals/ Sponsored Products
1st Runner-up	$400 Cash and Winner Medals/ Sponsored Products
2nd Runner-up	$300 Cash and Winner Medals/ Sponsored Products

Merit Awards

CATEGORY A & B

Awards	Prizes
Best Presentation	$300 cash and Merit Award Medals / Sponsored Products
Best Knowledge	
Best Strategy	
Best Learning Journey	
Judge's Commendation	

More information can be found at Challenge Booklet v2.0 Point 7.2.

Merit Awards are presented to all teams in each category by a panel of judges in recognition of outstanding attributes displayed.

LEARNING JOURNEY

Workshops

Date	Workshop	Venue
14 May 2019	Category A	Dalton
15 May 2019	Category B	Dalton
16 May 2019	Open Category	Dalton
21 May 2019	Category A	Dalton
22 May 2019	Category B	Dalton
28 May 2019	Open Category	Dalton
2 July 2019	Open Category	Annexe hall 1
3 July 2019	Open Category	Annexe hall 1
All the workshops mentioned above are conducted in Science Centre Singapore. More information can be found at Challenge Booklet v2.0 Point 11.		

RESOURCES

Registration

Student/Teacher Packages

PACKAGE 1: $1000

5 X Parrot Mambo

1 X multiport Charger

5 X Extra Batteries

PACKAGE 2: $1000

5 X DJI Tello Edu

1 X multiport Charger

5 X Extra Batteries

DRONE ODYSSEY CHALLENGE

Science Centre Singapore · ep-tec · WorldSkills Singapore · ITE · Eng Siang International · Parrot Education

The End

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