



RTA

ROBOTICS

CATALOG 2019-2020





FTW ROBOTICS

FTW (For the Win) Robotics explores the STEM principles behind drones and their use in our society. We offer drones, curriculum, quizzes and activities to give students a well-rounded perspective on this emerging new technology

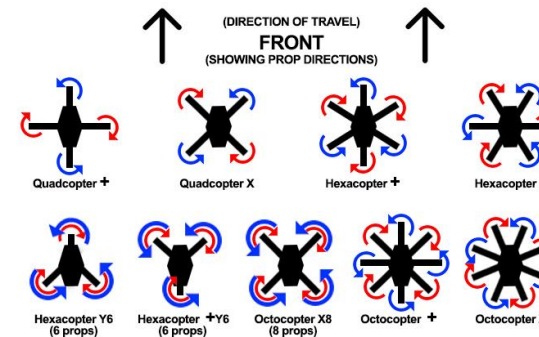
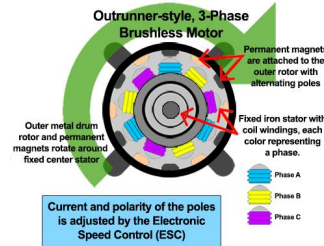
Parrot[®]
E D U C A T I O N



FTW is the exclusive EDU partner for Parrot Education and DJI

Curriculum/Units

- 1: Design & Documentation
- 2: Safety Considerations
- 3: Introduction to Drones
- 4: Fundamentals of Flight
- 5: Airframes
- 6: Propellers
- 7: Ground Control Stations & FPV
- 8: Common Sense Flying
- 9: Regulations & The FAA
- Included in each Unit
 - Lesson Plan
 - PPT Presentation
 - Student Reading
 - Student Activity
 - Unit Quiz
 - Vocab
 - 2 Vocab Quizzes



Case Studies

- We've developed a case study that allows students to explore each section of the curriculum and how it is applied in the real world

Quizzes

- Each Unit ends with a multi-question quiz where students answer a series of multiple choice, true/false, and write-in answers

Presentations

- Teacher materials available through online classroom or through a PPT presentation to give multiple options depending on your style of teaching

FTW Curriculum	FTW-007
Per School	\$999.99

CURRICULUM

		Min # of Hours	Max # of Hours
Unit 1: Design & Documentation	Introduces the Engineering Design process and stresses the importance of cooperation, teamwork, and documentation to solve problems	3	7
Unit 2: Safety Considerations	Stresses the importance of adopting a “safety attitude” when building and flying a drone. Covers workshop safety and outdoor flying	3	7
Unit 3: Introduction to Drones	Covers nomenclature, history of ariel drones, reputation, airframe, configurations, basic components, and current/future uses of drones	4	7
Unit 4: Fundamentals of Flight	Introduces aerodynamics, history of flight, Newton’s Laws of Motions, Bernoulli’s Principle, four forces of flight, three axis of flight, how they apply to drone flight. Reveals issues aircrafts pilots encounter including air space, traffic patterns and safe altitudes	4	7
Unit 5: Airframes	Covers history of helicopter design, early multi-rotor design, various configurations, airframe sizes, and construction materials	3	5
Unit 6: Propellers	Covers history of propeller design, fixed-pitched and constant speed blades, airfoil design, size, pitch, and blade-count. Includes balancing tips and construction materials	3	5
Unit 7: Ground Stations & FPV	Introduces telemetry, data tracking, mission planning and 3D mapping and modeling. Covers first-person-view flying safety and drone racing options	3	5
Unit 8: Common Sense Flying	Discusses responsibility of flying and being “neighborly”. Discusses building or buying a drone	3	5
Unit 9: Regulations & FAA	Covers roll of the FAA and NTSB. Stresses importance of regulation, and lists registration and recreational use of drones. Section 333 capital exemptions and Part-107 are explained	2	3
		28	51

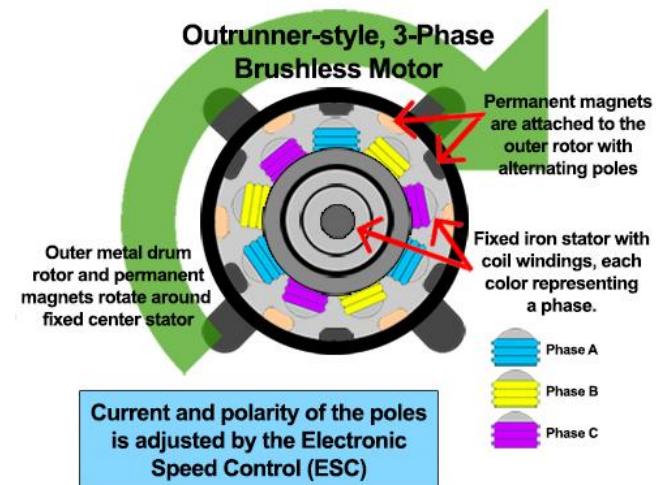
Unit 3: Overview of Drones

- What is a Drone?
- History of Drones
- Different Types of Drones
- Drone Components
 - Airframes
 - Motors
 - Propellers
 - Electronic Speed Controllers
- Flight Controllers
- Batteries
- Uses of Drones in Society

For a **CLOCKWISE (CW)** direction, use a **PUSHER** propeller.



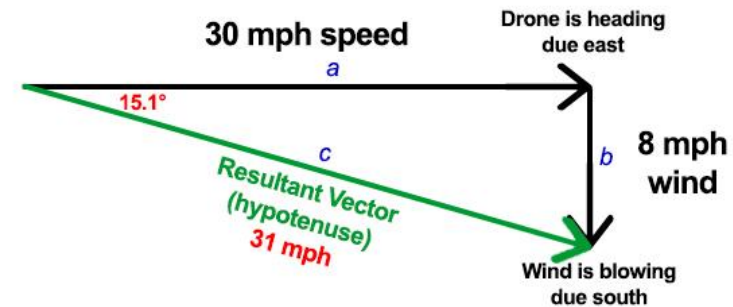
For a **COUNTER-CLOCKWISE (CCW)** direction, use a **NORMAL** propeller.



Unit 4: Fundamentals of Flight



- What Aerodynamics?
- Brief History of Flight
- Newton's Law of Force & Motion
- Bernoulli's Principle
- Weight
- Drag
- Thrust
- Mechanical Design of a Plane



- National Transportation Safety Board
- The FAA – Federal Aviation Administration
- UAS Incidents and FAA Response
- Regulation of UAS Operations
- Federal Control
- State & Local Control
- Summary of UAV Rules from FAA





Curriculum/Units

- 1: Pathway to Certification
- 2: Drone Theory & Aeronautical Basics
- 3: Regulations & Operating Rules
- 4: Airspace Classifications & Operating Requirements
- 5: Aviation Weather, Effects & Sounds
- 6: sUAS Loading & Performance
- 7: Emergency Flight Procedures
- 8: Crew Resource Management (CRM)
- 9: Radio Communications
- 10: Airport Operations
- 11: Maintenance & Inspection Procedures
- 12: FAA Knowledge Test – Exam Prep

FTW Curriculum	FTW-007
Per School	\$999.99

Each Unit Includes:

- Dedicated Handouts
- PowerPoint Presentations
- Vocabulary Definitions w/Quiz
- Student Activities
- Unit Quiz
- Teacher Lesson Plan

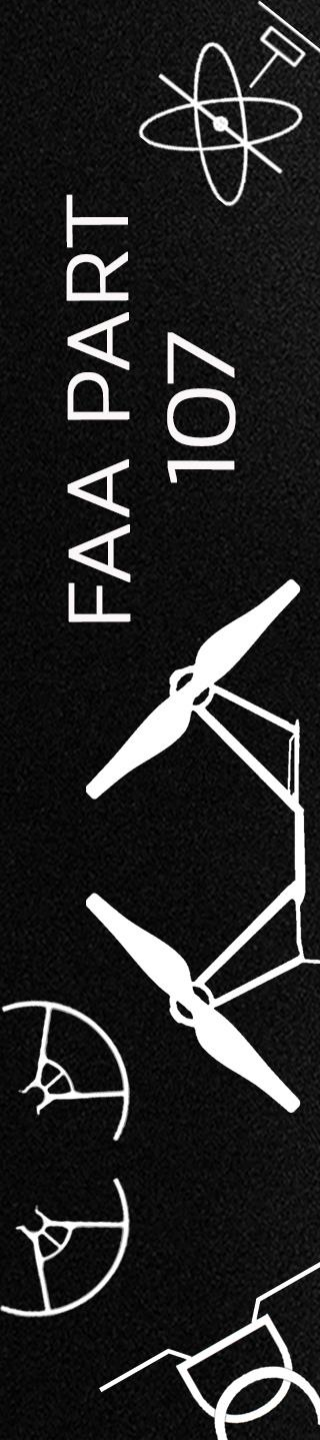


To qualify for a Remote Pilot Certificate, a person must:

- Demonstrate aeronautical knowledge by passing an initial Aeronautical Knowledge Test at an FAA-approved Knowledge Testing Center
- Be vetted by the Transportation Security Administration (TSA)
- Be at least 16 years old
- Read, write, speak and understand the English language (exceptions will be made for medical reasons, such as hearing impairment).
- Be in the physical and mental condition that would not interfere with the safe operation of a sUAS

(1 day = 60-minute class)

	Description	Minimum # days (if some activities are skipped)	Maximum # days (if all activities completed)
Unit 1: Pathway to Certification	Covers role of the FAA and NTSB. Stresses importance of regulation, and lists registration and recreational use of drones. Section 333 Exemptions and Part 107 Rules are explained.	4	6
Unit 2: Drone Theory & Aeronautical Basics	Covers nomenclature, reputation, configurations, basic components, and current/future uses of drones. Introduces aerodynamics, Newton's Laws of Motion, Bernoulli's Principle, four forces of flight, three axes of flight, how they apply to drone flight.	5	8
Unit 3: Regulations & Operating Rules	Covers general FAA requirements for Remote Pilot Certification including definitions and responsibilities.	6	9
Unit 4: Airspace Classifications & Operating Procedures	Covers airspace classifications, how to identify them on Sectional Charts and regulations governing sUAS flight in and around airspace.	5	8
Unit 5: Aviation Weather, Effects & Sources	Covers effects of weather on flight including altitude, cloud formations, thunderstorms, and fog.	5	8
Unit 6: sUAS Loading & Performance	Covers weight and balance considerations for payload. Also, effects of physics on flight maneuvers regarding Center of Gravity.	3	4
Unit 7: Emergency Flight Procedures	Covers types of emergencies including lost link and fly-aways and how to respond to them.	3	4
Unit 8: Crew Resource Management (CRM)	Covers Remote PIC decision-making when recognizing crewmember health. Includes physiological and medical issues.	3	5
Unit 9: Radio Communications	Covers types of radio communications used by manned pilots and how to locate the frequencies.	3	4
Unit 10: Airport Operations	Covers operations around airports including standard traffic patterns and other issues the Remote PIC needs to be aware of.	5	8
Unit 11: Maintenance & Inspection Procedures	Covers preflight responsibilities and importance of documentation required by the FAA.	3	4
Unit 12: FAA Knowledge Test – Exam Prep	Provides practice questions and a link to an online practice test available for students.	5	10
Supplements		---	8
	TOTALS:	50	86



COMPEITION



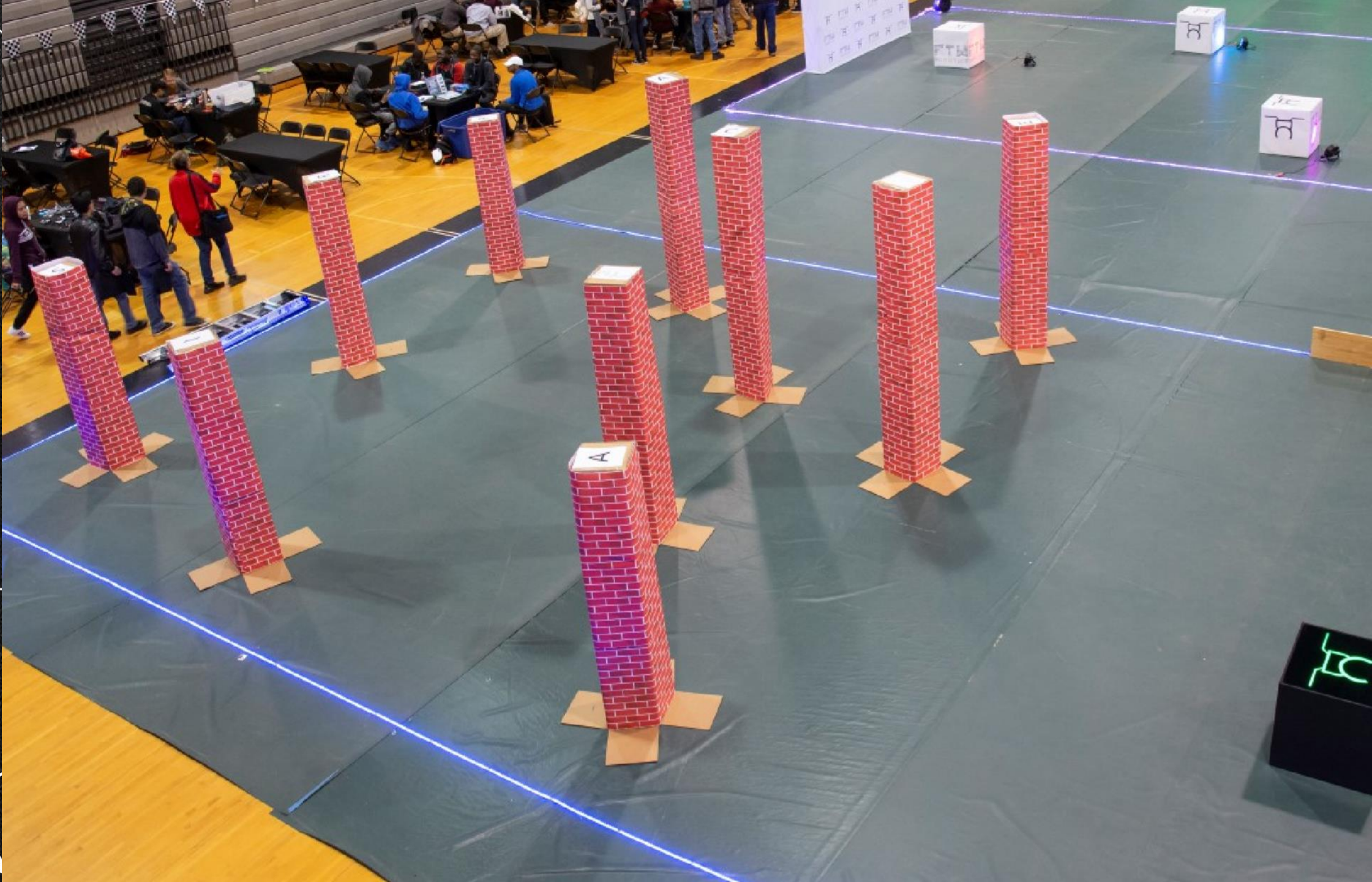
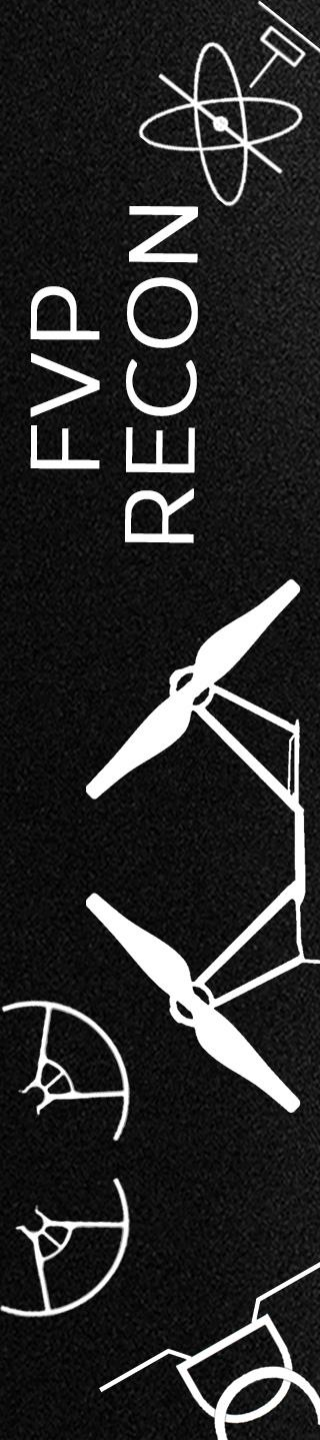
COMPEITION



DRONE RACING

COMPEITION



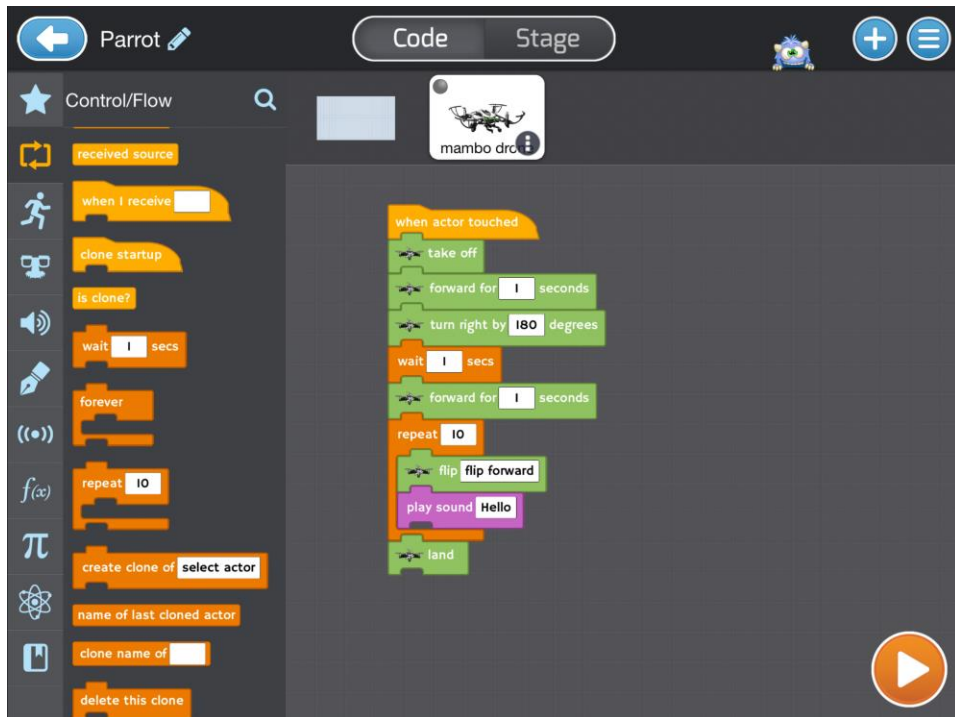


COMPEITION





Tynker Software



Explore Drones 101

Through nine engaging lessons and 50 fun activities, students will watch short interactive videos to learn important concepts, solve puzzles to test their understanding, and complete their own projects to apply the concepts they've learned. Each lesson is designed for a class period of 45-60 minutes. All student work is automatically tracked and assessed so you can monitor individual progress and mastery charts.

What Kids Learn

Drones 101 teaches students to write programs that control drones. They'll learn programming concepts like sequencing, repetition, events, conditional logic, problem solving, and debugging. Drones 101 also builds and reinforces STEM skills that students are learning in other classes, such as geometry, art, math, and science.



FTW-E01 Elementary Classroom Set

Drone Package

- 6 Parrot Mambo Drones
- 2 Fypad Controllers
- 24 Battery

Extra

- 2 Propellers Packs (4 Propellers in each pack)
- 2 Spare Motors (A + C Motor in each Pack)
- 1 hulls (2 hulls in each pack)
- 6 Charger

Classroom Field

- 3 Telescopic Keyhole Gates



Tynker “Drones 101” programming course for 30 students
Welcome Booklet (1-year subscription)

Quantity	Price
1	\$2,200.00



FTW-M01 Middle School Classroom Set

Drone Package

- 6 Parrot Mambo Drones
- 6 Batteries + Charger
- 2 hulls (2 hulls in each pack)
- 2 Flypad Controllers
- 2 Mambo Camera's

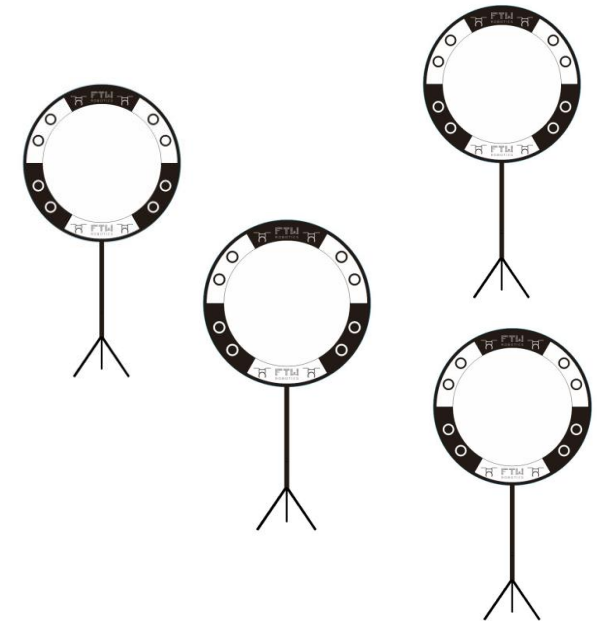
Extra

- 4 Propellers Packs (4 Propellers in each pack)
- 4 Spare Motors (A + C Motor in each Pack)
- 12 Battery

Classroom Field

- 4 Telescopic Keyhole Gates

Tynker "Drones 101" programming course for 30 students
Welcome Booklet (2-year subscription)



Quantity	Price
1	\$2,500.00



FTW–M02 Middle School Classroom Set

Drone Package

- 10 Parrot Mambo Drones
- 10 Batteries + Charger
- 2 hulls (2 hulls in each pack)
- 2 Flypad Controllers
- 2 Mambo Camera's

Extra

- 4 Propellers Packs (4 Propellers in each pack)
- 4 Spare Motors (A + C Motor in each Pack)
- 20 Battery

Classroom Field

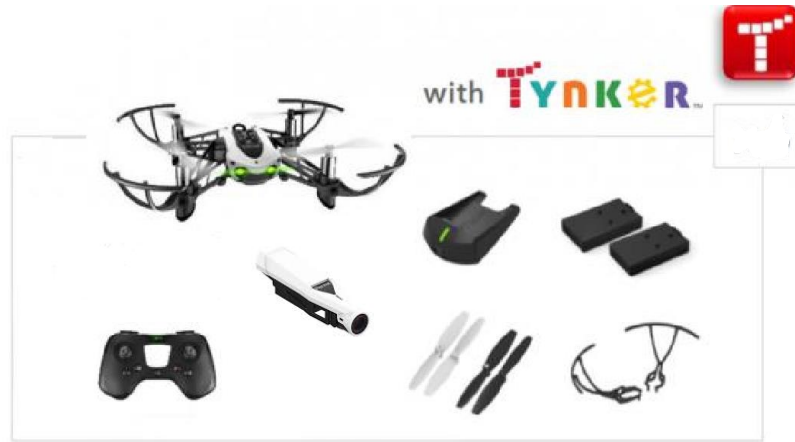
- 4 Telescopic Keyhole Gates

Curriculum

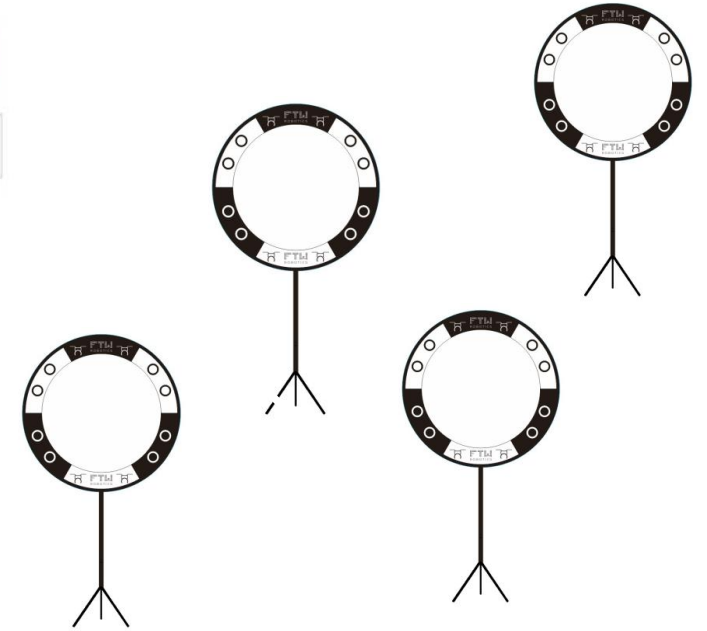
FTW Curriculum – 9 Units

Tynker “Drones 101” programming course for 30 students

Welcome Booklet (2-year subscription)



Quantity	Price
1	\$4,000.00





FTW-H01 High School Classroom Set

Drone Package

- 6 Parrot Mambo Drones
- 6 Batteries + Charger
- 2 hulls (2 hulls in each pack)
- 2 Flypad Controllers
- 2 Mambo Camera's
- Anafi Drone

Extra

- 4 Propellers Packs (4 Propellers in each pack)
- 4 Spare Motors (A + C Motor in each Pack)
- 12 Battery

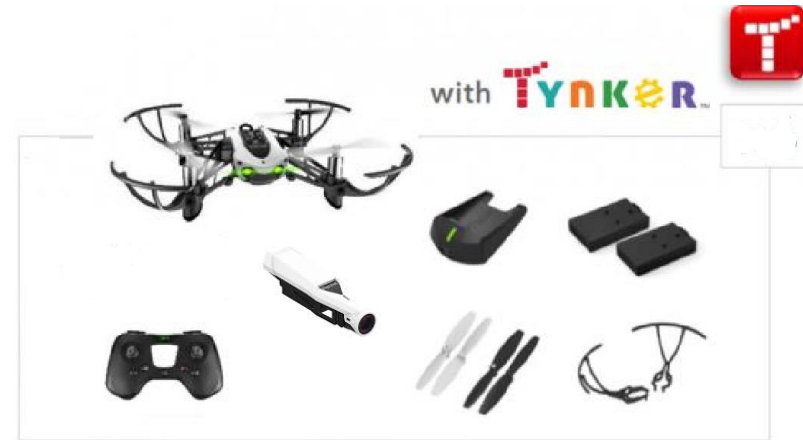
Classroom Field

- 4 Telescopic Keyhole Gates

Curriculum

FTW Curriculum – 9 Units

Tynker “Drones 101” programming course for 30 students
Welcome Booklet (2-year subscription)



Quantity	Price
1	\$4,700.00





FTW–H02 High School Classroom Set

Drone Package

- 8 Parrot Mambo Drones
- 8 Batteries + Charger
- 2 hulls (2 hulls in each pack)
- 2 Flypad Controllers
- 2 Mambo Camera's
- Anafi Drone

Extra

- 4 Propellers Packs (4 Propellers in each pack)
- 4 Spare Motors (A + C Motor in each Pack)
- 16 Battery

Classroom Field

- 4 Telescopic Keyhole Gates

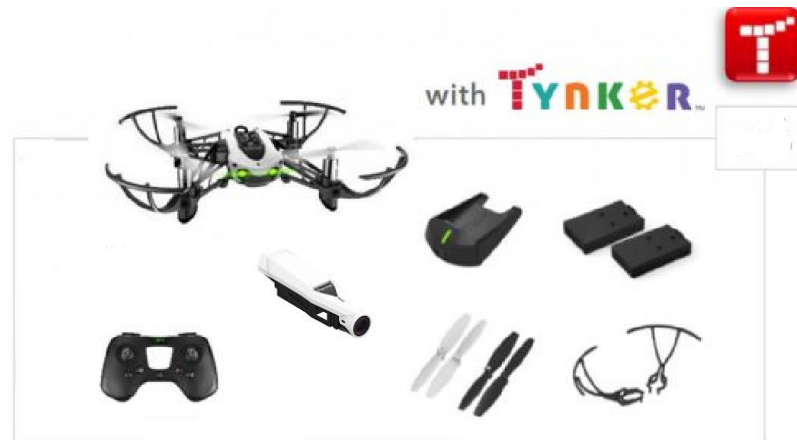
Curriculum

FTW Curriculum – 9 Units

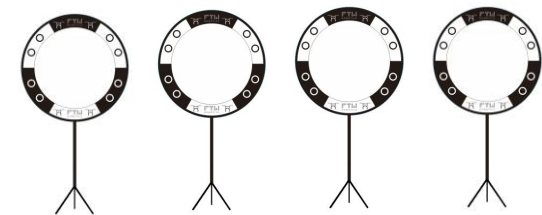
FTW Pilot Certification Curriculum

Tynker “Drones 101” programming course for 30 students

Welcome Booklet (2-year subscription)



Quantity	Price
1	\$5,800.00



RTWA

ROBOTICS



Taking S.T.E.A.M. to New Heights

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