Launching a High School Drone Program Through Teacher-Expert Partnerships

miniCAST El Paso 2025

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Program Outline

Background: What are drones?

Getting Started in Your School

Benefit: Why are drones important for the future?

Crash Course: Safely Operating a UAV

Objectives

Goal: Equip teachers with a clear, compliant, and structured plan for launching a program.

Objectives

1. Understand the benefits of drones in STEM education
2. Learn basic drone operations and safety
3. Explore curriculum integration strategies
4. Identify beginner-friendly drones and kits

Drones—What Are They?

Unmanned Aerial Vehicles (UAV)

Pilots issue commands with a controller or preprogram a flight path for accurate data collection.

Industrial Applications

Documentary & filmmaking

Real estate & construction

Military surveillance

Storm tracking

Humanitarian & disaster relief

Oil, gas & mineral exploration

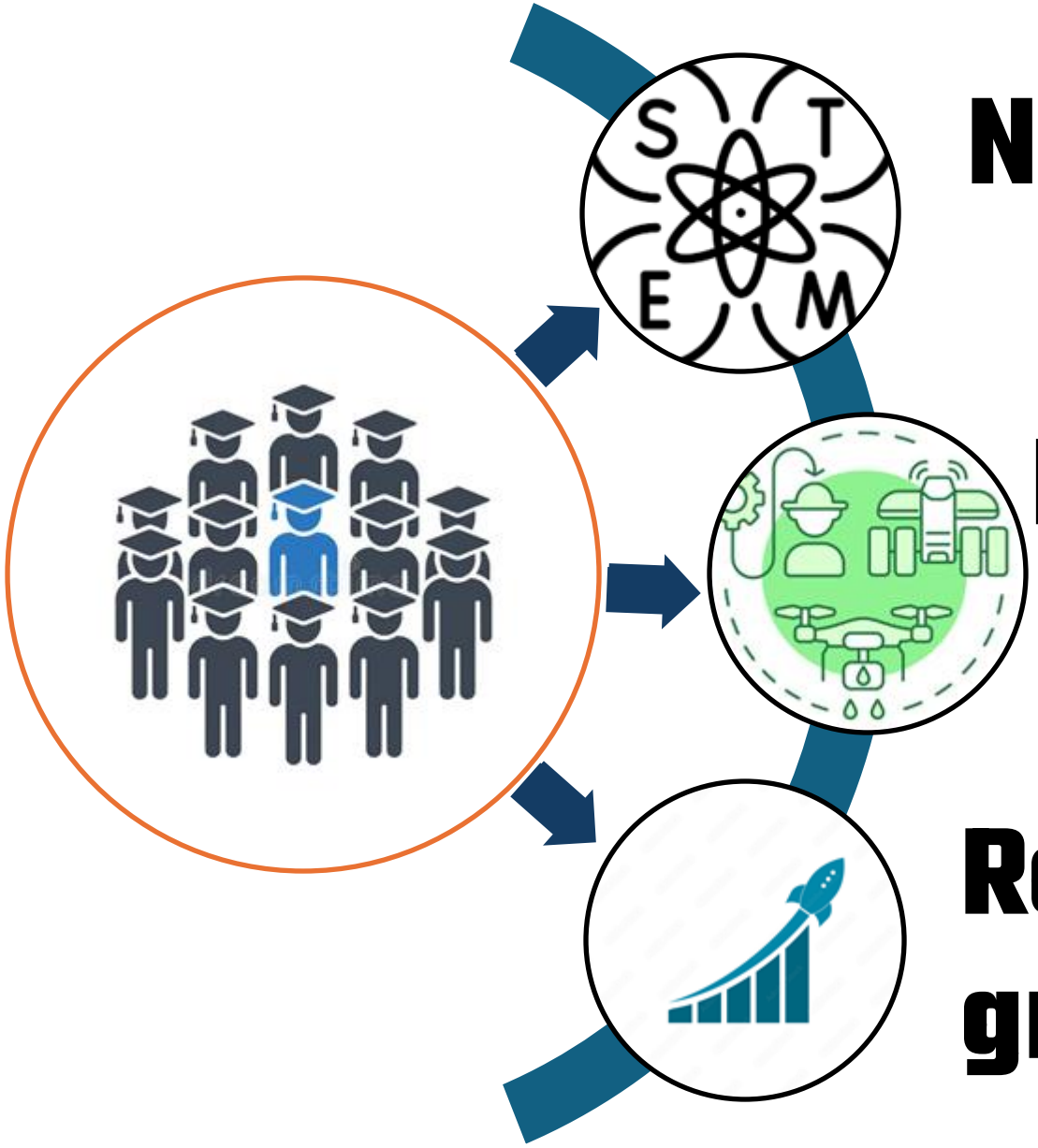
Crop growth monitoring

Wildlife population monitoring

Logistics delivery

Energy infrastructure inspection

Why Drones Matter



Nexus of STEM

Future-ready skills

Rapidly growing

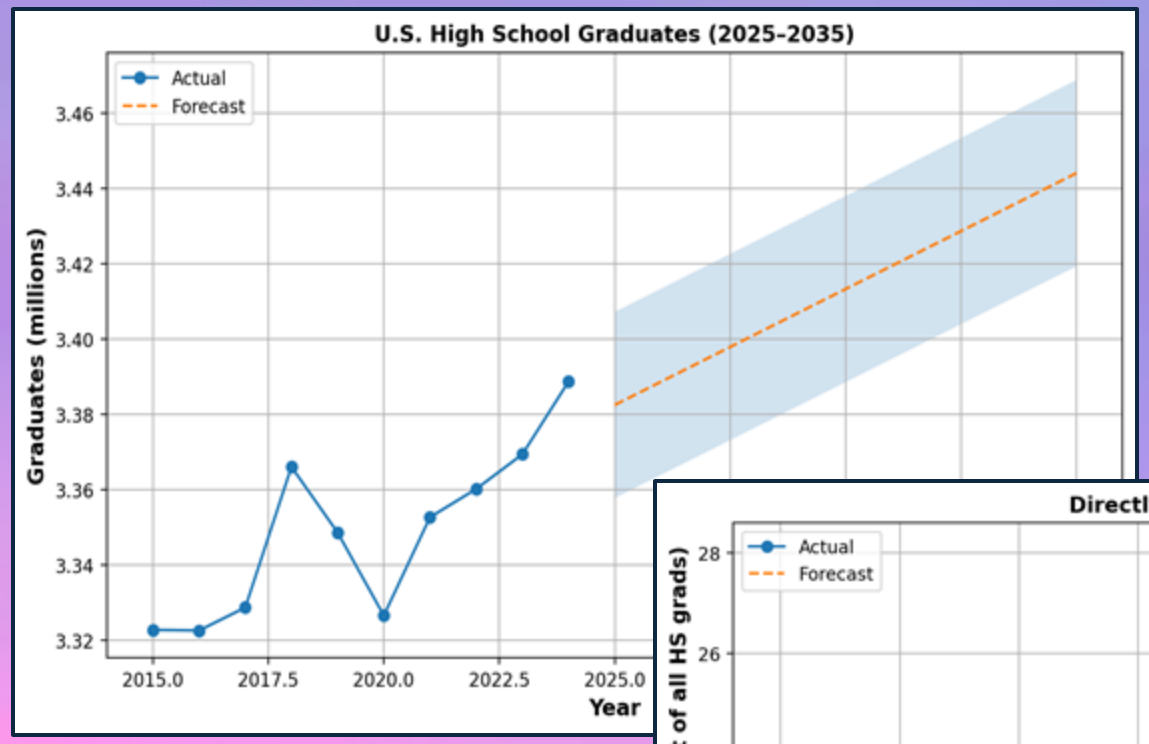
Why Drones Matter

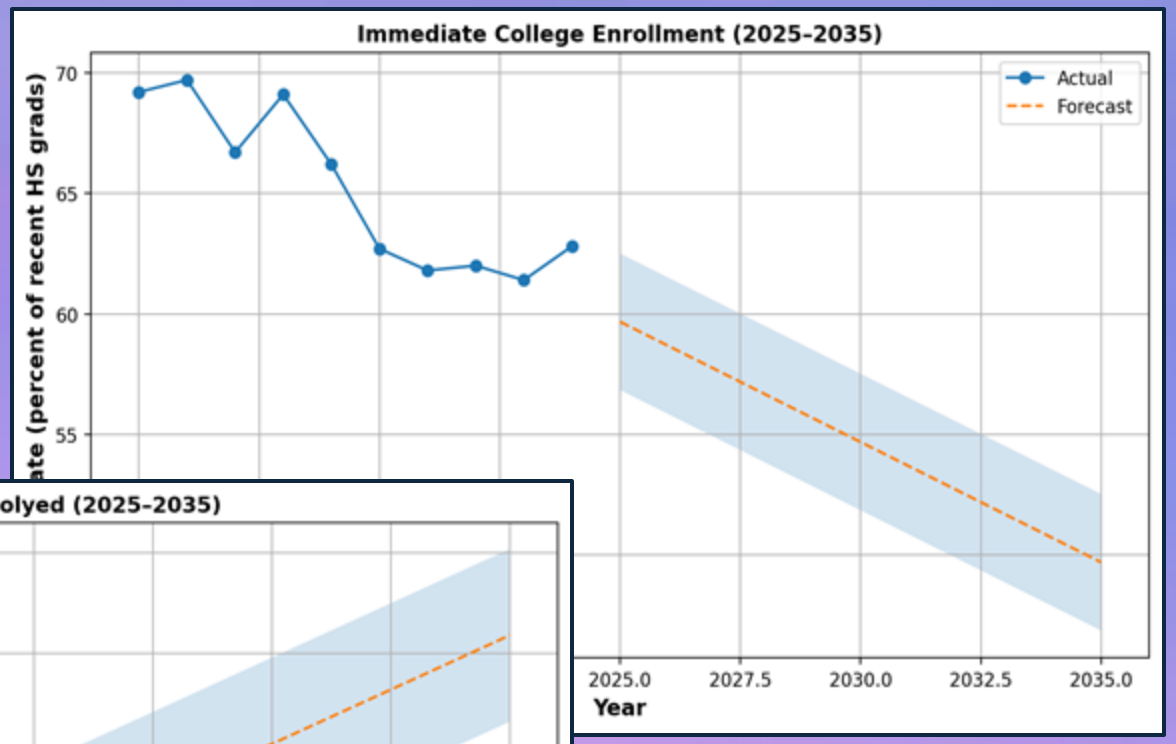
- **STEM skills are applied at every step of drone operation and maintenance.**
- **Rapidly growing industry**

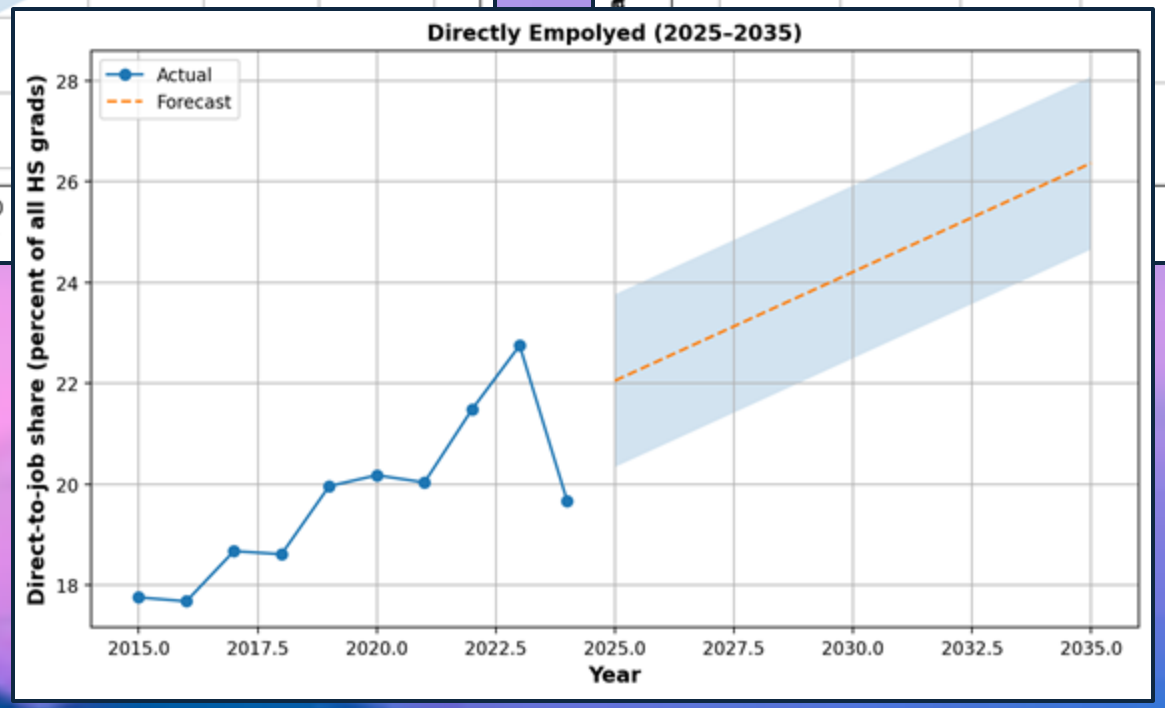
Applied Skills:

- Robotics
- Engineering
- Programming
- Data Analysis

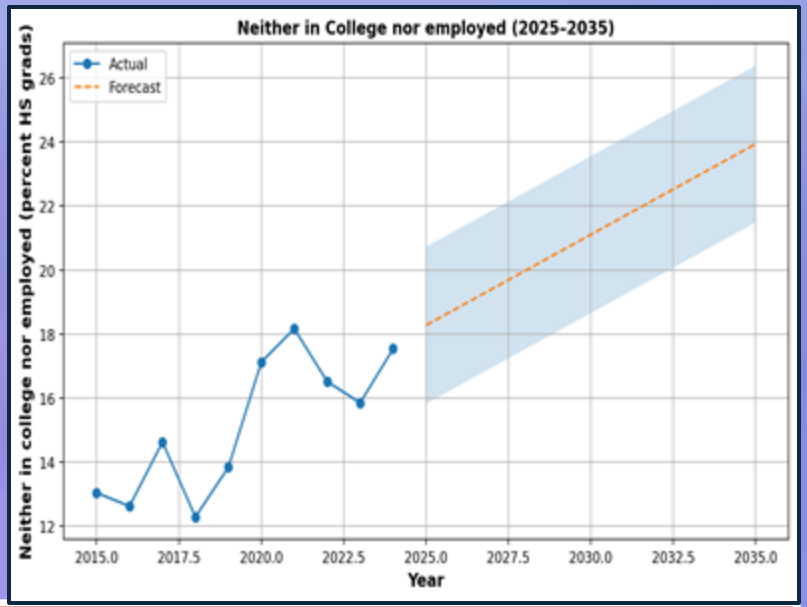
High School Graduate Pathway

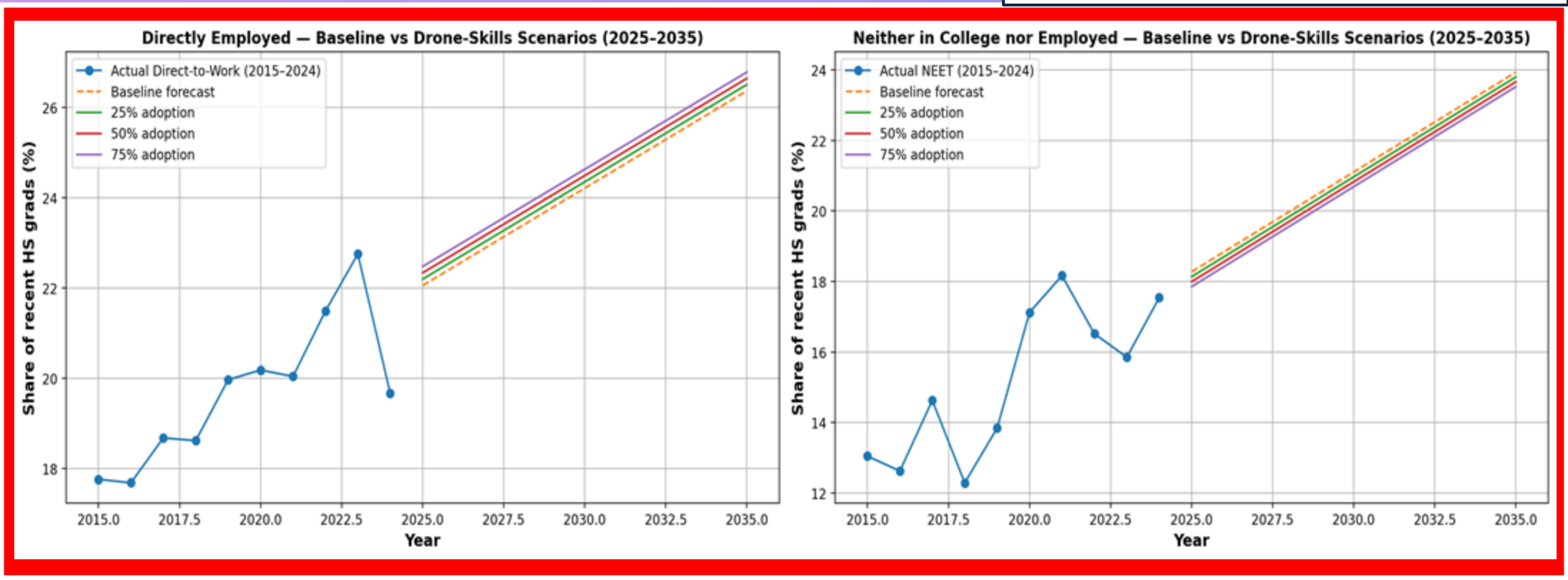






High School Graduate Pathway





Drone Program Integration

Club

Course Unit

Full Course

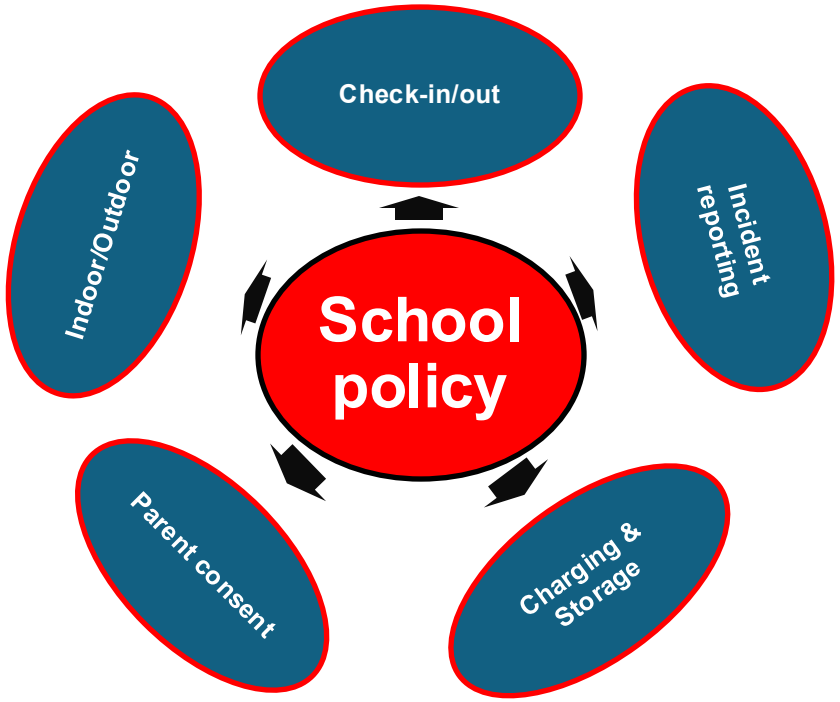
Collaboartive

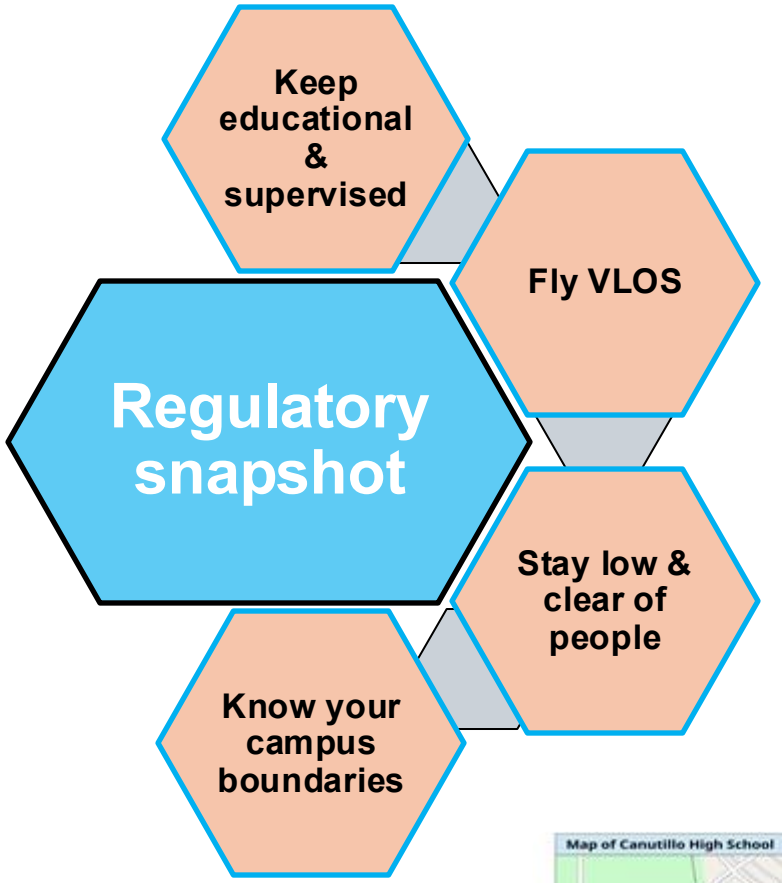
Problem-solving

Creativity &
Comm. Skills

Data skills

Rules & School Policy Essentials





Districts often require local approval → **Site SOPs**

(EL Paso district specifics in the checklist)

Compliance Gateways

Regulatory Choice

Part 107 Certificate	TRUST Certificate
Commercial	Recreational
$175	Free

Crucial Point

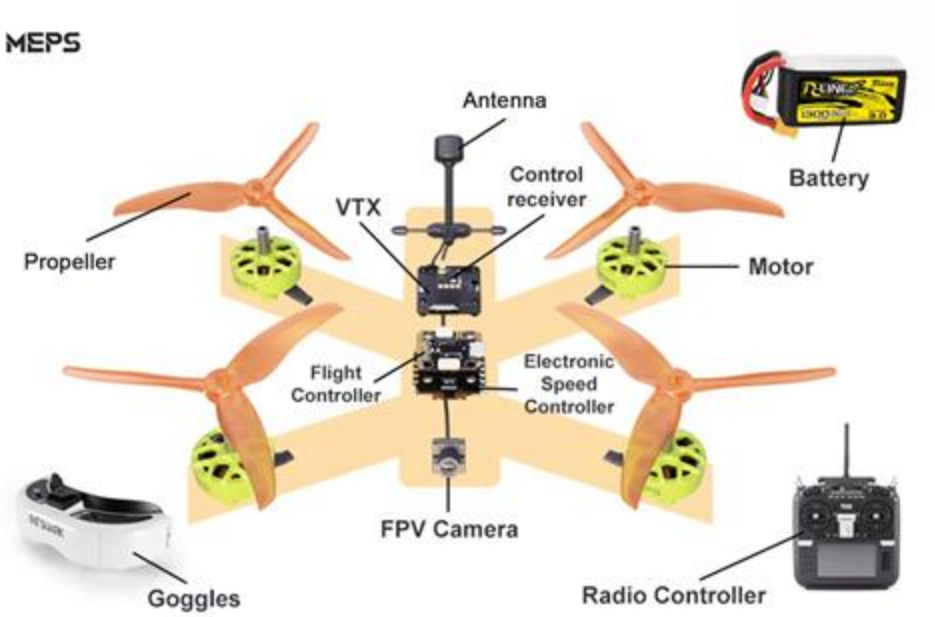
- Use the Recreational Exception for instructional purposes

Else,

- Instructing teacher **must** hold a Part 107 Remote Pilot Certificate

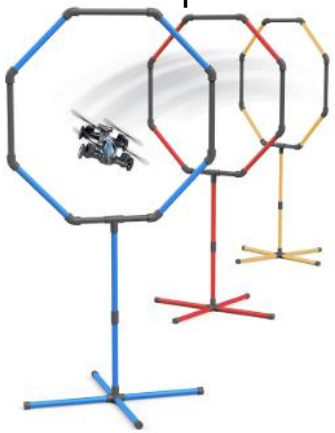
- FAA-recognized Community Based Organization (CBO)

Drone Basics & Safety



- Quadcopter: 4 rotors, battery-powered, remote-controlled
- Fly indoors, initially below the eyes, for safety.
- Use propeller guards/safety goggles.
- FAA Part 107 is required for outdoor class use.

Hoops



Cones

Arena/Cage

Flight safety

- Preflight checklist
- Crew
- Geofencing
- Winds
- No-fly areas
- Emergency cut-off

DRONE

- **D** — Don't fly near airport /airfields.
- **R** — Remember to stay below 400 ft and 200 ft from people/buildings.
- **O** — Observe your drone at all times.
- **N** — Never fly near aircraft.
- **E** — Enjoy responsibly.

Starter drones and kits

Beginner-friendly Drones

	Camera Drones		Programable Drones		Indoor Drones	
Type	DJI Mini	Potensic Atom SE	DJI Tello EDU	Robolink CoDrone Edu	Cetus	Tinyhawk
Price range	$240-$350	$250 - $300	$220-$235	$330	$160-$250	$89 - $300
Environment	Outdoor	Outdoor	Classroom	Classroom	Caged arena/gym	Caged arena/gym

Planner

Group Activity

In groups of 3, draft a 4-week drone unit that's ready to run:

- Who teaches what?
- What students produce?
- How will you assess outcomes?
- Space/equipment needed.

Outputs: a fully filled planner with 2 minutes share-out session.

Planner

Weekly Unit Planner

Week	Focus Block	Teacher-Led	Expert Partner Role	Student Task/Deliverables	Assessment	Space / Equipment
1	Flight Foundations	Safety culture, rules & privacy, LiPo basics, preflight, sticks practice (hover box, yaw).	Guest demo and quick safety audit of SOP/checklists.	Signed safety contract, completed preflight, Skills Sheet.	Flight skills checklist (hover, takeoff/land), preflight completion.	Gym/cage, micro-trainer drones, cones/hoops, landing pads, LiPo-safe bags, operations binder.
2	Mission Planning	Airspace on campus, risk assessment, mapping vs. inspection, plan a mission on campus map.	Mission co-design: mark hazards, define success metrics, roles.	Draft mission plan with roles and risk controls annotated on campus map	Mission plan rubric (objective, risks, steps, metrics).	Classroom printed campus map, rulers/markers, clipboards.
3	Applied Mission	Field op brief, weather/NOTAM check (as applicable), supervised flight to execute plan.	Field safety officer/spotter, on-site feedback during operations.	Execute mission, collect image set, maintain flight and battery logs.	Field log review, incident-free ops, image set completeness.	Outdoor slot sub-250 g drones, cones, chargers/batteries, radio/whistle, first-aid kit.
4	Showcase/Reflection	Data download, organize/rename, annotate findings, practice communication.	Feedback panel or Q&A on findings and career paths.	3-minute presentation plus one paragraph of reflection on safety and results.	Demo/presentation rubric, reflection check.	Classroom; projector, laptops, sample rubric printouts.
5	Adv. Maneuvers (opt.)					

THANK YOU

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CONNECTING GEOSCIENCE & COMMUNITY

Resources

Scan Me!

Contact

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