🚀 Rocketry Webinar Session 1 – Q&A Summary

❓ What is rocketry?

Rocketry is the process of designing, building, and launching rockets. It helps develop engineering, science, and problem-solving skills.

❓ What are the main parts of a rocket?

- Nose cone – reduces air resistance
- Body tube (airframe) – main structure
- Fins – stabilize flight
- Motor – provides thrust
- Parachute – ensures safe landing
- Shock cord & couplers – connect components

❓ What are the phases of rocket flight?

1. Launch
2. Powered flight
3. Coast (motor burnout)
4. Apogee (highest point)
5. Descent (parachute deploys)
6. Recovery

❓ What forces act on a rocket?

- Thrust – pushes rocket upward
- Weight (gravity) – pulls it down
- Drag – air resistance

These affect:

- Center of gravity (CG) – balance point
- Center of pressure (CP) – aerodynamic force point

For stability: CP must be behind CG.

❓ Why are fins important?

Fins stabilize the rocket in flight. Most designs use 3 fins for optimal balance between stability and efficiency.

❓ What materials are rockets made of?

- Fiberglass (common for high-power rockets)
- Cardboard (entry-level rockets)
- Carbon fiber (light and strong, but expensive and blocks signals)
- Plastic (nose cones)
- Wood or composite fins

❓ What determines how high a rocket goes (apogee)?

- Motor power
- Rocket weight
- Aerodynamics (shape, drag)
- Design choices (fins, diameter, materials)

❓ What is the highest altitude achieved by the team?

~35,439 feet (competition rocket), higher than typical commercial airplane cruising altitude.

❓ How fast can rockets go?

Up to Mach 2 (~1,150 mph), with successful recoveries around Mach 1.5.

❓ Why do rockets fail or explode?

Common causes:

- Motor failure
- Structural weakness
- Incorrect parachute deployment
- Design or assembly errors

Failure is common and part of learning.

❓ What is the most important part of a rocket?

The recovery system (parachute), because it ensures safe landing and reuse.

❓ How far do rockets travel after launch?

- Small rockets: ~0.5–1 mile
- Large rockets: several miles, sometimes requiring driving

❓ Do rockets use GPS or tracking systems?

Yes—GPS trackers, radio beacons, and signal receivers are commonly used.

❓ Can rockets be steered?

Yes, but it's complex, regulated, and uncommon in hobby rocketry.

❓ Can you put a camera on a rocket?

Yes, but it may reduce performance due to added weight and drag.

❓ What certifications are required?

Through organizations like Tripoli Rocketry Association or NAR:

- L1 – basic high-power rockets

- L2 – larger motors + exam
- L3 – advanced rockets + review

❓ Can younger students participate?

Yes, through mentored programs (M1) for ages 12–17.

❓ How long does it take to build a rocket?

Typically several months from design to testing.

❓ How expensive is rocketry?

Ranges from inexpensive (small rockets) to thousands of dollars for advanced builds.

❓ What is the biggest rocket the team built?

About 10 feet tall and around 40 pounds.

❓ What is the largest motor used?

Up to O-class motors; larger ones exist but are rare and expensive.

❓ How many rockets can launch at once?

Usually one at a time for safety; occasionally multiple in special cases.

❓ What are multi-stage rockets?

Rockets with multiple stages that ignite in sequence; the team commonly builds 2-stage rockets.

❓ What makes the team successful in competitions?

- Iterative design, Understanding scoring rules
- Experience, Teamwork

❓ **What's the hardest part of building a rocket?**

Design complexity, assembly challenges, and time-consuming steps like sanding and curing materials.

❓ **Where is the best place to launch rockets in Kansas?**

Argonia, Kansas, with a launch ceiling up to 50,000 feet.

❓ **What is the key takeaway?**

Rocketry is about experimenting, learning from failure, and improving through persistence

Thank you, KSU Wildcat Rocketry Team!

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