Rocketry

Science & Technology Branch – Elective Step 5

Purpose

The purpose of 'Rocketry' is to learn how this science has propelled our advancement in technology. Also, to understand that this is one of many areas where math can be fun.

1. What are the parts of a rocket?
2. What types of fuel can a rocket use?
3. How has rocketry benefited mankind?
4. What are some safety procedures used in rocketry?
5. What is a simple and safe rocket that you can make?

Notes to the Trail Guide //

1. The goal is not for the boys to be experts at these topics, but to gain an increased knowledge and awareness of the Step.
2. Make it relative to your patrol.
3. Remember, these lessons should build from Fox to Hawk and from Hawk to Mountain Lion.
4. See the Leaders Guide for more information on Steps.

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Skill Progression

	1. Picture matching 2. Identification Game 3. Nomenclature 4. Make a paper rocket
	1. Make and launch an air or water fueled rocket
	1. Make and launch a store bought rocket 2. Use a rocket to move a payload

Helps

1. What are the parts of a rocket?
    a. **Goal**: To understand that a rocket is made up of many different functional parts.
    b. **Lesson**: Each part serves a purpose for the rocket.
    c. **Examples**:
        i. Fuselage
        ii. Motor/Engine
        iii. Fins
        iv. Nose Cone
        v. Payload
        vi. Parachute
2. What types of fuel can a rocket use?
    a. **Goal**: To understand that there are many types of fuel for rockets.
    b. **Lesson**: Energy takes many different forms and can be utilized for work.
    c. **Examples**
        i. Hobby
            1. Compressed Air
            2. Pressurized Water
        ii. Gas
            1. GOX (gaseous oxygen)
        iii. Liquid
            1. LOX (Liquid Oxygen) and kerosene (RP-1)
            2. Monopropellants such as hydrogen peroxide, hydrazine, and nitrous oxide
        iv. Solid
            1. Black powder (gunpowder) propellants
            2. Zinc–sulfur (ZS) propellants
            3. "Candy" propellants
        v. Gel
3. How has rocketry benefited mankind?
    a. **Goal**: To understand the history and innovation of rocketry.
    b. **Lesson**: Learn what fundamental advances have helped humankind through rocketry.
    c. **Examples**:
        i. Space exploration.
        ii. Communications: Radios and phones.
        iii. Heat and cold technologies: Thermal materials.
        iv. Science theories and laws.
4. What are some safety procedures used in rocketry?

a. **Goal**: To understand that rocketry involves some dangerous aspects and safety must be maintained.
b. **Lesson**: Learn some basic safety procedures.
c. **Examples**:
    i. Checklist
    ii. Countdown procedure
    iii. Safe distance
    iv. Safety lockout for the launcher
    v. Flight safety (Where the rocket flies and lands)

5. What is a simple and safe rocket that you can make?
    a. **Goal**: To understand how simple and safe rockets can be made.
    b. **Lesson**: Learn to build a simple rocket.
    c. **Examples**:
        i. Air powered rocket
        ii. Water powered rocket
        iii. Solid fueled rocket (store kit)

Scripture Ideas

Psalm 8:3

- Fox – God created the heavens and the stars.
- Hawk – His wondrous creation declares His glory.
- Mt Lion – God's creation is for us to explore and share.

Activity Ideas

- See the relevant patrol and branch section of the activities
- Or, create your own activity relevant to your troop and region
- Make some functioning or even non-functioning rockets.

Game Ideas

- Check the games section online for game ideas
- Or, create a game that works for your patrol