

CC Cycle 2 Science Experiments & Projects: In-Class Lesson Plans & Visuals

I hope these make all the hard work you do a little easier!
(email: nicoleliemyang@gmail.com)

Notes to the Tutor/Teacher:

I have included the Foundations Guide information needed to do each project. My teaching notes are placed within the instructions to help students learn about the topics while they work on the projects.

What to Do Each Week in Class:

Always stress the **Scientific Method** in each experiment by getting the students to orally state what the purpose, hypothesis, materials etc. are in your experiment.

- State the Scientific Method

(ie: sing it to the tune of *Happy Birthday*- "Scientific Method, Purpose, Hypothesis, Materials, Procedure, Results, Conclusion.)

Purpose – stated in the Van Cleeve experiment verbiage

Hypothesis – Typed out as the first of my "More Talking Points".

Materials – Hold them up to the students and ask them to name the materials

Procedure – Go through the steps listed in the experiment together

Results – The "what happened?" of the experiment. Talk about what you saw and if your hypothesis was right or wrong.

Conclusion – The "why did that happen?" of the experiment. Found partially in the Van Cleeve "Why?" segments, and explained more fully in my talking points and images.

Relate it back to Cycle 2: mention how we are studying Ecology, Astronomy and Physics in our experiments and our new grammar pegs. I have done some for you in blue. Find your best way to explain how learning about God's creation is learning more about God's character and what He's done for us.

Week 11

Project: Rockets

- **Purpose:** To build a rocket and learn how rockets work.
- **Hypothesis:** Will the rocket launch into the air? How high will it go?
- **Materials and Procedure:** Follow the instructions as per the rocket kit provided for your class.
- **Results:** The rocket launched into the air.
- **Conclusion:** Why Do Rockets Launch?

Rockets launch because of [Newton's 3rd Law of Motion](#): "For every action, there is an equal and opposite reaction" (which we will memorize in Week 18). Inside the rocket, a chemical reaction takes place causing gases to explode. For our rocket, the explosion was a force or action downward, and Newton's 3rd Law says an equal force will push back on the rocket propelling it upward. So the bigger the explosion downward, the farther a rocket will shoot upward. Scientists need to measure out the size and weight of their rocket, as well as how far they want it to go in order to figure out how big of an explosion (or force) is needed.

(Week 17: [Newton's 2nd Law of Motion](#) states that "Force equals mass time acceleration".)

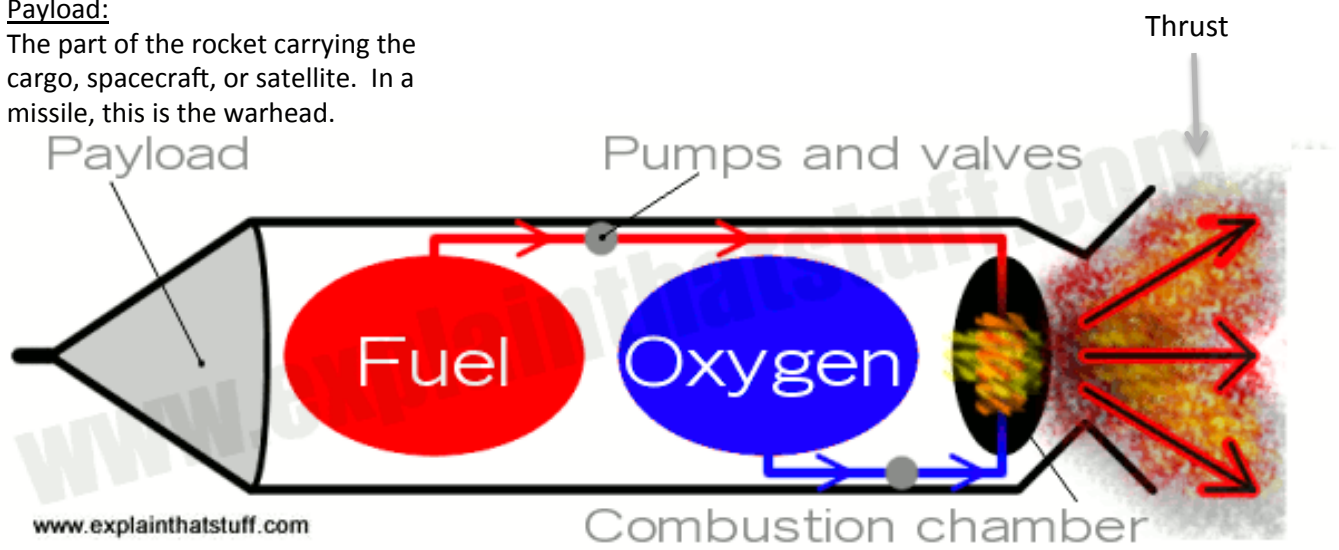
To leave Earth, a rocket needs to work against gravity, and so it uses up most of its fuel in the first few minutes. Rockets work a lot like the explosion of gunpowder in a firecracker, meaning that once started, the explosion can't be shut off until the fuel present is used up. Air is needed to help create their combustion (explosion), but rockets have to carry their own oxygen since there is no air in space. Engines in the rocket pump the fuel (which is hydrogen) and the oxidizer (liquid oxygen) into the combustion chamber at the bottom of the rocket. Then it burns the propellant (mixture). Hot exhaust escapes through a nozzle at the end of the rocket creating the thrust, or the force needed for liftoff. Astronauts use valves to switch on and off the liquid-fuel engines during flight.

Space shuttles use solid rocket boosters to help them reach outer space, and they are released (jettisoned) when their fuel is used up.

Relating this to Cycle 2: Rockets deliver the satellites, cameras, shuttles, and space equipment scientists use to study outer space. Cycle 2's Astronomy segment studies our solar system, including U.S. space missions in Week 12 (Mercury, Gemini, Apollo, Shuttle), and Newton's Laws of Motion in weeks 16-18 that are needed to power our rocket.

Payload:

The part of the rocket carrying the cargo, spacecraft, or satellite. In a missile, this is the warhead.



Week 11

Project: Rockets

CC Science Cycle 2

E. Nicole Yang

CC Connected: "nicoleliem"



- Vehicle configuration: Delta II 7925-9.5
- Customer: USAF
- Launch site: SLC-17A at CCAFS

