Newton's Laws of Motion
BALLOON VEHICLE PROJECT
Introduction and Guidelines

Purpose

Design a balloon-powered vehicle that can travel unassisted a total displacement of at least 20 feet.

Supplies (per group)

4 lids (you provide)	2 skewers	2 straws
1 small container with lid (you provide)	1 balloon	1 meter of masking tape

Procedure

1. As a group, choose a group name or vehicle name to be used throughout the project.
2. Design and build a unique vehicle using any of the materials listed above. Assembly must be done during class. You may not use more than what is listed, but you do not have to use everything.
3. Demonstrate the distance it can travel.
4. Each student is to write a report that includes the following:
    a. A detailed and labeled picture of your vehicle
    b. An explanation of Newton's three laws of motion and how they were used in the design of your vehicle
    c. A design analysis: If the vehicle had a flaw, describe it and analyze how it could be fixed (Examples of possible flaws might be that the vehicle constantly flipped over, drove in circles, would not move forward.
    d. A thoughtful paragraph response to these questions:
        i. How did each of Newton's laws of motion relates to your vehicle design and how your vehicle performed?
        ii. What would you improve if you could start again?

As you work together, treat one another well by drawing on each person's contribution and respecting each member of the group. In other words work within both a moral

framework (a set of norms about how to treat one another), and a physical framework (a set of rules governing how objects behave, including Newton's laws of motion). Is God involved in one, both, or neither of these frameworks? If both, is God involved in the same way?
Use complete sentences and be grammatically correct.

Grading Rubric
The rubric for grading your performance, your vehicle's design and performance, and your balloon vehicle paper is included on this sheet. Please refer to the rubric when writing your paper.

Your Name _____ **Group Name** _____ **Hour** _____

Newton's Laws : BALLOON VEHICLE PROJECT
Grading Rubric

Distance: _____ feet

Vehicle *displacement* (not *distance*) is at least 20 feet
(-1 per each half foot short). _____ / 40

Unique Design

Vehicle is one of a kind, stylish, aesthetically pleasing, and
demonstrates thoughtfulness. _____ / 5

Materials

Vehicle design meets the guidelines of allowed materials. _____ / 5

Participation

As a group member, you followed class rules, worked well with other
group members, and did your part to leave the work area clean. _____ / 5

Balloon Vehicle Project

FASTly
FAITH & SCIENCE TEACHING

Your individual report must include the following items. Provide them in this order.

Picture

Picture carefully drawn (no eraser marks, etc.), well-labeled, easy to decipher _____ / 5

Newton's Three Laws	1st	2nd	3rd	
Report clearly and correctly explains each law (2 pts)	_____	_____	_____	
Report clearly relates each law to balloon vehicle (2 pts)	_____	_____	_____	
Report tells how each law affected vehicle design (2 pts)	_____	_____	_____	_____ / 18

Analysis

Report states vehicle performance (1 pt)	_____	
Report analyzes what worked well (2 pts)	_____	
Report analyzes what did not work well (2 pts)	_____	
Report suggests modifications/improvements (2 pts)	_____	_____ / 7

Newton, God and Laws

The paragraph contains a thoughtful, thorough discussion of a Christian perspective on God's role in the order of the natural world. _____ / 10

Quality of writing

The paper reads well and is written at a grade-appropriate level, using correct grammar, punctuation, and sentence structure. _____ / 5

TOTAL SCORE

(A bonus point will be awarded to students who turn in this rubric stapled to the top of their report.) **_____ / 100**