Title: It *Is* Rocket Science!

Curriculum: Physical Science

Grade Level Span: 9th

Purpose: Students begin to understand the relationship between mass and motion by measuring acceleration and velocity.

Description: Each student will construct and launch a rocket-powered car along a paved track.

Activities	Curriculum Standards	NETS for Students
1. Gathered information about motion. • **Making informed choices regarding information providers online** • **Efficiently use online resources for research needs**	SCI 9-12 A1	2, 7
2. Gathered resources specific to rocket car construction.		
3. Design car of known mass within specifications.		
4. Launch car along instructor supervised track.		
5. Record relevant data (time and distance).		
6. Analyze relevant data. • **Selecting appropriate technology tools for analysis purposes**	SCI 9-12 A2	8
7. Make a reasonable connection between mass and resultant motion based on data.		8

• **Apply technology tools data analysis**	SCI 9-12 B4	
8. Specify implications for future investigations.	SCI 9-12 E1	
9. Prepare multimedia presentation. • **Using technology to compile, synthesize, produce, and present information**	SCI 9-12 E1	10

Tools and Resources

(List all Web sites, specific software and hardware needs)

Hardware (other):
Pinewood Derby Car Kit (Available from businesses that sell Scouting supplies)
Eyebolts of appropriate size
Estes Rocket Engine ("C" size recommended; other sizes may be substituted)
Stop watch (several)
Wire or line (50# test monofilament recommended; other material at least that strong may be substituted)

Software:
Spreadsheet program w/ graphing
Presentation program

Web sites:
www.estesrockets.com
www.arborsci.com

Assessment

(How will you assess the students' learning? If you have a rubric, record it here. Be as specific as possible)

4 student builds car; car runs complete length of track; accurate data analysis; supportable conclusion; presentation to class
3 student builds car, car runs complete length of track; satisfactory data analysis; unsupported conclusion; presentation to class
2 student builds car, car runs less than complete length of track; poor data analysis; unsupported conclusion; poor presentation to class
1 student builds car, car runs less than complete length of track; no data analysis; no conclusion; no presentation to class
0 student fails to build car

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Personal Account

(Have you taught this lesson sequence before? What are the great learning/experiences you had?)

I found this activity to be very exciting and very high interest to the students. I (dblinn) do have access to a paved bike trail just behind my school and have the time and space to do this activity with a range of variables. Some of the technical difficulties of making timings can be frustrating but

practice and experience will sort most of that out. I try not to let car design be at the center of the evaluation as students have a wide range of backgrounds that may or may not allow them the opportunity to build a "really cool car." The process of measurement and the connection of mass to motion are the important parts of this activity and even a student with limited building skills should have the chance to do well on the activity as a whole.