



Sixth Grade Science Roller Coaster Project



General Information

The Purpose and Goals for this Project:

1. The design of your team's coaster will demonstrate that you understand forces, motion, and energy scientific concepts.
2. Your team will use and apply scientific methods that we've learned this year to solve this problem.
3. To continue to improve on cooperative lab group skills, and learn the value of teamwork. Your success and grade will depend on how well your construction team can manage the time and materials given.

Parts of the Project:

1. Asking the question and/or defining the problem.
2. Doing background research and developing a hypothesis.
3. Designing an experiment to test the hypothesis
4. Conducting the experiment & collecting data
5. Analyzing the data
6. Communication the results of the experiment

Requirements:

Individual Requirements:

1. (**Daily grade**) Research all topics on force, motion, and energy concepts, plus roller coaster history and amusement parks. Take notes in bullet format.
2. (**Test grade**) Write a background information report & works cited page, that consists of *at least* 1 paragraph per topic and a works cited page listing all of the sources used in the preparation of the report
3. (**Lab grade**) Analyze the data
4. (**Lab grade**) Write a 5 paragraph conclusion
5. (**Test grade**) Keep a daily journal that includes:
 - a. daily building **procedures** (how it was done)
 - b. problems that were encountered
 - c. how problems were solved
 - d. next steps
6. (**Lab grade**) Turn in completed lab report

Team Requirements:

1. (**Double Lab grade**) Build a roller coaster that meets all criteria using only the required materials
2. (**Daily grade**) Keep **daily** journals that includes:
 - a. **track progress journal**
 - b. problems encountered
 - c. how problems were solved
 - d. what needs to be done
3. (**Lab grade**) Test your roller coaster **and collect data** on a **chart** and then **graph it on computer using Excel**

Design & Construction Teams:

- ★ Each team should have three – four members. **Each member is responsible for the development and construction of the roller coaster** including:
 - ★ Creating a unique name for the roller coaster
 - ★ Creating unique names /designs for important curves_/loops/ hills, corkscrews, etc.
 - ★ Creating a Company Name & logo, then submits both for approval

Job descriptions and responsibilities:

Construction Superintendent {C.S.} - (*highly organized / a leader/ writer/ planner/ reads and follows direction well*)
(Organizes and communicates)

- ★ Oversees and directs the entire project
- ★ Responsible for daily organization and plan for each member
- ★ Helps build / type reports / problem solve / clean up
- ★ The **only** person that reports to the C.E.O. (the teacher!)

Building Foreman {B.F.} (*math & computer skills*) – responsible for management of materials and proper storage of construction project
(Set-up and clean-up)

- ★ Responsible for getting materials and supplies out & put up each day
- ★ Reports any problem to Construction Superintendent
- ★ Helps build / type reports / problem solve / clean up

Financial-Operations Manager {F.O.M.} – (math /computer /hands-on skills/ measurement skills)

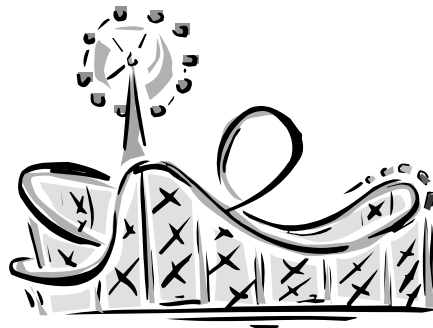
(Financial data entry)

- ★ Writes out daily materials list
- ★ Measures out materials and **collects data** on use of materials
- ★ Helps build / type reports / problem solve / **clean up**
- ★ Reports any problems to Construction Superintendent

Jobsite Worker {J.W.}- (great typing skills, following written directions, computer use)

- ★ **Main** typist for reports.
- ★ Helps build / problem solve / clean up
- ★ Reports any problems to Construction Superintendent

For three person teams, this job may be combined with the jobs of the Building Foreman and Financial Operations Manager



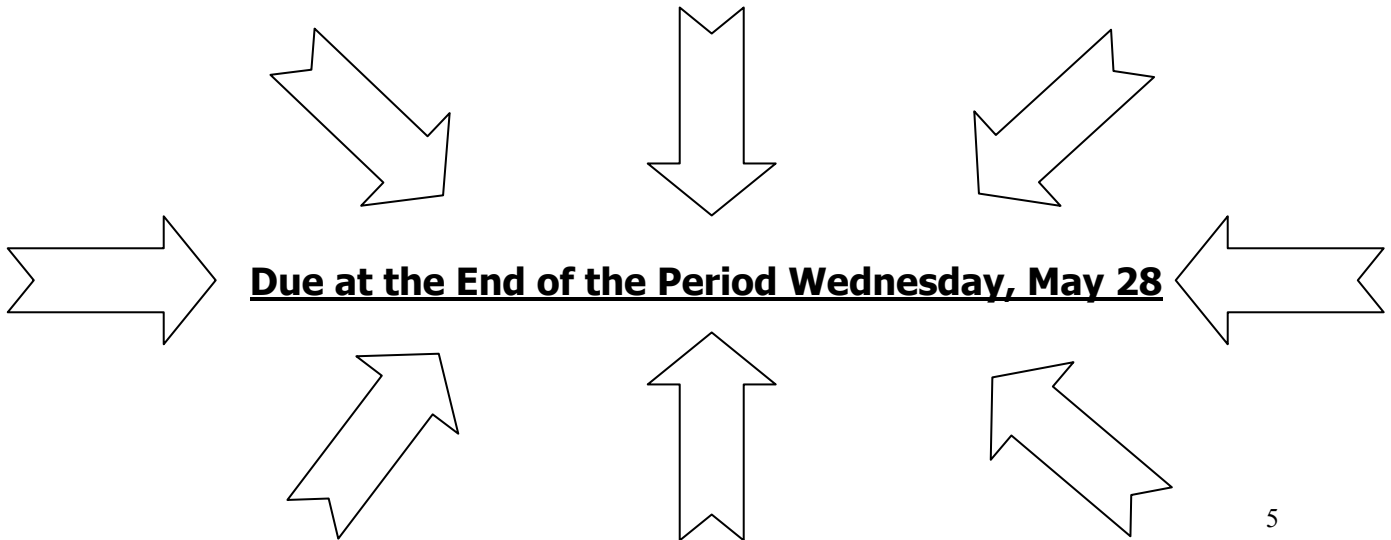
Tasks to be completed everyday:

- ★ DAILY Journal Reports in each individual journal (**each team member**)
- ★ Daily list of materials (**FOM**)

FINAL Written Lab Report:

Includes these items in this order:

1. Title page
2. Question or Problem
3. Purpose
4. Background Information report
5. Hypothesis
6. Materials List
7. Variables List (Independent variable, dependent variable, controlled variable)
10. Step by step procedure
11. Data charts
12. Data graph of average speeds for your roller coaster
13. Data analysis
14. Conclusions: (5 paragraphs)
 - a) Answers the original question
 - b) Gives the results (data chart and graph) from your experiment
 - c) Explains the meaning of those numbers
 - d) Explains what your group learned from this lab about how a roller coaster works.
 - e) Gives at least 2 ways that the information from this experiment can be applied and another 2 ways that the project could be expanded (by showing what could / should have been done differently).
15. Works Cited page in correct format.



GRADING:

Grades will be taken on each of the following:

1. Research Notes and Rough Draft of works cited – daily grade
2. Background information report in correct format – test grade
3. Final Written Report – lab grade
4. Daily Journal – test grade
5. Performance and participation – lab grade
6. Roller Coaster Model – test / project grade

You will be given rubrics and a check list that explain the criteria for grades. Use them to guide your work!!