

It's a Wild Ride

Science Content Standards

Key: (Roman numerals, numbers, and letters reference actual Idaho Standards)

ALL CAPS = BROAD SCIENCE TOPIC AREAS

Bold = K-12 Idaho Science Standards

a), b), c) in a yellow row = 8th Grade Content Knowledge and Skill Targets for Science

Italics = Represent teacher-selected specific performance objectives for project.

Investigating:

Learning the necessary preliminary content-specific skills

I. UNIFYING CONCEPTS OF SCIENCE

1. Understand systems, order and organization.

b. Know that there is order and predictability in the universe.

i. Predict how Newton's Laws affect an object in motion.

III. CONCEPTS OF PHYSICAL SCIENCE

4. Understand concept of motion and forces.

d. Learn Newton's three laws and understand the effects of gravity and friction.

i. Demonstrate all three laws of motion with given supplies and write an explanation for each demonstration.

c. Know how an object's position, direction of motion, and speed can be measured.

i. Create graphs and charts of an object's motion indicating distance, speed, time, acceleration, and force.

Expanding:

Building on knowledge and skills

II. CONCEPTS OF SCIENTIFIC INQUIRY

1. Understand scientific inquiry and develop critical thinking skills

a. Identify and create questions that can be answered through conducting research and investigations.

i. Research information on the Internet on four main areas of roller coasters create database.

ii. Expand knowledge base by reading packets of information on different aspects of roller coasters given in class.

b. Design and conduct scientific investigation using controls and variables.

i. Design and build a model of a roller coaster that works according to the criteria given by teacher.

ii. Design model of roller coasters on the Internet and manipulating variables Make predictions of the motion according to Newton's Laws.

b. Select and use appropriate tools and techniques to gather and display data.

i. Use home-built roller coaster to complete investigations in class.

**Applying:
Utilizing skills in real-world processes**

Standards, benchmarks, and objectives addressed:

XI. INTERDISCIPLINARY CONCEPTS

1. Understand that interpersonal relationships are important in scientific endeavors.

a. Know the importance of working as a team to solve problems.

i. Contribute on a team project that is trying to sell a roller coaster design to an amusement park.

XI. INTERDISCIPLINARY CONCEPTS

2. Understand technical communication.

a. Read, understand, and follow technical instructions.

i. Demonstrate use of technology that enhances group presentation.

b. Write and articulate technical information.

i. Include a technical report with group presentation.

I. UNIFYING CONCEPTS OF SCIENCE

2. Understand concepts and processes of evidence, models, and explanations.

a. Know that observations and data are evidence on which to base scientific explanations.

i. Make observations, collect data from research and display data to persuade a company to buy your group's roller coaster design. Show evidence of scientific explanations in presentation.

c. Use models to explain or demonstrate a concept.

1. Build a mini-model (maquette) of group's design of roller coaster and create blueprint of design to use in presentation.

d. Develop scientific explanations based on scientific knowledge, logic, and analysis.

i. Complete observations and explanations of concepts learned while attending local amusement park.