

OVERVIEW

Most students are fascinated by mysteries because they are able to take pieces of information and see how they fit together as they attempt to solve a problem. Unfortunately, some students are under the impression that all mysteries are connected with murder and suffering because that's what they see on television and in the movies. Students need to recognize that real people investigate and solve mysteries daily in science, history, health, engineering and many other disciplines. ROLLER COASTER is a simulation that exposes your students to a scientific mystery. As they use the scientific method during this simulation, they have the opportunity to work as scientists do to solve a real mystery. This simulation will engage, excite and challenge students as they actively increase their understanding of the scientific process. Students are motivated and excited as they uncover clues and gain information, much like a detective does. ROLLER COASTER is part of Interact's Science Mysteries series, stressing the scientific method and discovery. The author also contributed INSECT ISLAND to this series and wishes to thank Beth Arner who began the series with PETERSON'S POND and MYSTERIOUS MACHINE.

ROLLER COASTER consists of three distinct phases.

- **Phase 1** covers the basics of the laws of motion and related concepts through brief written histories and basic science experiments and activities.
- **Phase 2** explores more details and offers further examples of the laws of motion and related concepts as students work to solve the mystery.
- **Phase 3** provides several options for extending this simulation, including ideas for culminating events and challenging independent study projects.

UNIT TIME CHART

This Unit Time Chart is a guideline. Alter as desired.

Phase 1: Momentous History (Optional)

EUREKA! MOMENT 1	EUREKA! MOMENT 2	EUREKA! MOMENT 3	EUREKA! MOMENT 4	EUREKA! MOMENT 5
Student Guide: Phase 1 EUREKA! ACTIVITY 1 GLOSSARY MY SCIENCE JOURNAL YOUR SCIENCE JOURNAL SCIENTIFIC METHOD	Student Guide: Phase 1 EUREKA! ACTIVITY 2 Science Journals	Student Guide: Phase 1 EUREKA! ACTIVITY 3 Science Journals	Student Guide: Phase 1 EUREKA! ACTIVITY 4 Science Journals	Student Guide: Phase 1 EUREKA! ACTIVITY 5 Science Journals

Phase 2: Roller Coaster World

ROLLER COASTER 1	ROLLER COASTER 2	ROLLER COASTER 3	ROLLER COASTER 4	ROLLER COASTER 5
Student Guide: Phase 2 T.E.A.M. ACTIVITY 1 CLUE SEARCH 1 CLUE TRACKING SHEET DESIGN TEST 1 SCIENTIFIC DETECTIVE RECORD FORM Debriefing Science Journals	Student Guide: Phase 2 T.E.A.M. ACTIVITY 2 CLUE SEARCH 2 CLUE TRACKING SHEET DESIGN TEST 2 SCIENTIFIC DETECTIVE RECORD FORM Debriefing Science Journals	Student Guide: Phase 2 T.E.A.M. ACTIVITY 3 CLUE SEARCH 3 CLUE TRACKING SHEET DESIGN TEST 3 SCIENTIFIC DETECTIVE RECORD FORM Debriefing Science Journals	Student Guide: Phase 2 T.E.A.M. ACTIVITY 4 CLUE SEARCH 4 CLUE TRACKING SHEET DESIGN TEST 4 SCIENTIFIC DETECTIVE RECORD FORM Debriefing Science Journals	Student Guide: Phase 2 CLUE SEARCH 5 CLUE TRACKING SHEET DESIGN TEST 5 SCIENTIFIC DETECTIVE RECORD FORM Analysis of all Clues Science Journals

Phase 3: Extensions (Optional)

Day 1	Day 2	Day 3	Day 4	Day 5
You determine the content and timing of PHASE 3. Optional presentations of groups' conclusions Challenge Projects MARBLE COASTER				

EUREKA! ACTIVITY 1, Part 2

Free Fall - Galileo's Experiment

Problem: Will two objects of the same volume, but different masses, hit the ground at the same time when dropped from the same height at the same time?

Your Hypothesis: _____

Materials: 2 balls the same size and shape, different masses

Experiment:

1. Hold one ball in each hand. Hold your hands the same height above the floor (about waist-high).
2. Let go of the balls at the same time.

Data: What did each ball do?

Conclusion:

1. Why do you think each ball hit the floor when it did?
- _____

2. What variable(s) were involved in this experiment?
- _____

3. How did the design of the experiment influence the data you collected?
- _____

4. How would these two objects behave if this experiment were conducted on the moon?
- _____