

# Gravity and Falling Objects

## Summary

Students will use a CBR (TI-Ranger) to measure the speed of a falling object. They will see how air resistance slows the speed of a paper coffee filter as compared to a book. They will also measure books of different sizes to discover the speed of falling objects is not dependent on the mass of the objects unless air resistance is a factor.

## Time Frame

1 class periods of 60 minutes each

## Group Size

Small Groups

## Materials

per group:

- 1 TI-73 Calculator and Ranger
- one coffee filter
- 2 books of different thicknesses
- [student worksheet](#)  
(attached)

## Student Prior Knowledge

Students will need to know and be able to use the formula for calculating speed and have had some experiences measuring moving objects.

## Instructional Procedures

- Read the introduction with students and describe where the materials for the activity are located.
- Pre-program the calculators to take a 3 second reading in meters. Set the start key for "trigger".
- Hand out the calculators and Rangers to students and allow them to take some readings of a moving object.
- Discuss what the graphs mean. A time vs. distance graph will show speed at any given point and the points can be traced with the curser.
- Read procedures with students and give them time to collect data.
- Discuss with class their results.

## Assessment Plan

### Scoring guide

:

1. Students test each object 3 times.....4
2. Students graph a line for each object.....4
3. Students answer analysis questions correctly.....4
  - The coffee filter should go more slowly.
  - The air holds it up or air resistance.
  - The two books should travel about the same speed?
  - The books were the same size(maybe) but different masses
  - This experiment should proved Galileo to be correct.

## Gravity

4. Student writes and thoughtful and thorough conclusion.....4

### Bibliography

Lesson Design by Jordan School District Teachers and Staff.

### Authors

[Utah LessonPlans](#)