

# It's A Weighty Matter

## Summary

This activity will help students understand weight, mass and gravity.

## Materials

- Ziploc bags (sandwich or quart size)
- One cup each of various items (marshmallows, gravel, rice, beans, cereal, etc.)
- Spring scale
- [It's a Weighty Matter worksheet](#) (pdf)
- Ruler

## Additional Resources

### *Books*

- *Gravity*  
, by Dan Greenberg (Newbridge Education Publishing, 1999, Item CA09660); ISBN 1582730245
- *The Magic School Bus Plays Ball*  
, by Joanna Cole; ISBN 0590922408
- *Gravity: Simple Experiments for Young Scientists*  
, by Larry White; ISBN 0761300899
- *Bowled Over: The Case of the Gravity Goof-Up*  
, by Chuck Harwood; ISBN 007007555
- *Why Doesn't the Earth Fall Up*  
, by Vicki Cobb; ISBN 0525672532
- *Which Way Is Up*  
, by Gail Kay Haines; ISBN 0689312857

### *Video*

Gravity is Attractive: What is Gravity? Produced by TMW Media Group

### *Laser disc*

Windows on Science, Primary Vol. 3, Force and Motion, Lessons 12 + 13

## Background for Teachers

Earth's gravity pulls everything towards its center. Gravity gives objects their weight. The weight of an object is a measure of the pull of gravity on that object. Matter is anything that takes up space and has weight. Mass is the amount of matter something has. Weight is the pull of gravity on the mass. More mass means more weight, because there's more for gravity to pull on.

## Intended Learning Outcomes

1. Use Science Process and Thinking Skills
2. Manifest Scientific Attitudes and Interests
3. Understand Science Concepts and Principles
4. Communicate Effectively Using Science Language and Reasoning

## Instructional Procedures

### Invitation to Learn

Race with Gravity ( *to be done with a partner*)

Ask your partner to hold the ruler, hanging down (with 1 on the bottom and 12 on the top), just above your outstretched hand. When your partner releases the ruler, try to catch the ruler as quickly as you

can. (By the time the message has traveled from your brain to your hand, gravity has already begun to pull the ruler down). Have a contest to see who in the class is the quickest to respond.

#### Instructional Procedures

Prior to the activity, place one cup of various objects into individual Ziploc bags. Paper punch a hole in the top corner of each Ziploc bag.

Estimate the order of the weights of the objects in the Ziploc bags from lightest to heaviest.

Measure the weight of each object using the spring scale.

Place the objects in the correct order from lightest to heaviest.

Graph the weights of the objects on *It's a Weighty Matter* worksheets.

#### Extensions

##### Art

Make a flip book illustrating the effects of gravity on an object.

##### Writing

Write a story about a day without gravity.

Pretend that you are Sir Isaac Newton and write a letter to a friend explaining your new discovery--gravity.

##### Family Connections

##### Race With Gravity

Have the students share this activity and the scientific principle involved at home with family.

##### A Homemade Scale

Pencil

Elastic

Large paper clip

Ruler

Various objects to be weighed

Tape the pencil to a table, so half of the pencil is hanging over the edge.

Hang the rubber band on the pencil.

Open the paper clip so it looks like an "S."

Attach the small loop of the "S" to the rubber band.

Compare the weight of different objects by hanging them from the large loop of the "S" in the paper clip. Observe and measure the length of the rubber band with each object.

##### Critter Catch

Toilet paper tube

18 inches of string

6" x 6" piece of aluminum foil

Tape

2" square of paper

Cover the bottom end of the toilet paper tube with paper and tape securely.

Tape one end of a string onto the piece of aluminum foil.

Crumble the piece of aluminum foil into a ball (critter) around the string so the foil ball fits easily into the hole of the tube.

Attach the loose end of the string to the open end of the tube.

While holding onto the tube, swing the aluminum ball into the air. Try to catch the aluminum foil ball in the tube.

Bring the critter catchers to school and share designs with classmates.

Discuss what is happening. Gravity is pulling the aluminum foil ball down, toward the center of Earth.

##### *Variation*

Use a cup in place of the toilet paper tube and 2" square of paper.

### Assessment Plan

Did the student accurately read the spring scale?

Did the student place the objects in the correct sequence from lightest to heaviest?

Can the student accurately replicate the activity with different objects?

### Authors

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