



GRACE Education Curriculum Gravity	
Teachers	Grades K-2
Math & Science	

Look at Me, I Know Gravity

Background Information: Gravity is the invisible force between all objects that causes them to be attracted to each other. The Earth possesses a strong gravitational pull because it has a lot of mass. Every object that has mass [which is pretty much everything] attracts every other object that has mass. This attraction is called gravity. The more mass the object has, the stronger its gravitational pull will be. Since the Earth is very big in relation to us, its gravitational pull is very strong compared to everyday objects like baseballs and people. The gravitational force between two objects gets stronger as they are brought closer together. Even though the Sun is much more massive than the Earth, we don't feel as much gravitational pull from it as we do from the Earth because it is so far away.

Objectives: At the end of the lesson, students will be able to:

- Make discoveries about gravity.
- Define gravity as the force that pulls objects down to Earth at the same speed.

Standards: Science: unifying concepts and processes; earth and space science; and science as inquiry

Vocabulary:

gravity	measurement	balance
gravitational pull	air resistance	scales

Materials:

Markers	Cassette player
Ball	Balloon
Face tissue	Rock
Lab handout	"Gravity and Me" song lyrics
"Gravity and Me" cassette tape	

Directions to the Teacher:

Use as many hands-on examples of gravity and balance as possible. Sing the song daily to reinforce the concept. Ask students what might happen with less gravity, more gravity, or no gravity. Show pictures or examples of gravity. Allow students to work in groups on the falling objects experiment as they complete the lab sheet. Encourage students to bring their best singing voices!

1. Show the students the ball, balloon, face tissue and rock. Ask: What will happen when we drop these items? Will they all hit the floor at the same time?
 2. Let students make predictions. Write their predictions on the blackboard or on poster board to display.
 3. Ask students to volunteer to drop the objects at the same time, and discuss what happens.
 4. Explain that gravity is the invisible force that pulls all things towards the earth at the same rate of speed. Explain that satellites use gravity to stay in the orbit of Earth. Also, explain that all planets have gravity, so they follow regular orbits.
 5. Use models to show students this in a hands-on way. Sing "Gravity and Me" song.
 6. Try dropping items from different areas: top of stairs, slides on playground, etc. Will they still fall at the same rate?
 7. Introduce balance. (Note: The tissue will fall at a different rate because of air resistance.) Ask: What is a balance? Give examples of balance and unbalance. If you have a seesaw, use it to show how a hands-on balance performs. A good web site to access this experiment is: <http://lyra.colorado.edu/sbo/mary/play/lever.html>
 8. Then have students experiment with balance. Have a student on one end and the teacher on the other end. How many students will be needed to balance the scale and prevent gravity from pulling the adult's side down?
 9. Use a balance scale with items of similar and different weights. Ask: What happens if more objects or heavier objects are placed on one side of the scale? Does the scale stay balanced, or does gravity pull the heavier side down?
 10. Use the song "Charlie Over the Ocean" to reinforce the concept that force works and gravity pulls, even through water.
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Extensions:

- Have students take the Gravity test at: <http://www.curtin.edu.au/curtin/dept/phys-sci/gravity/index2.htm>
- Have student put a pencil hole in the side of a Styrofoam cup about 1 inch from the bottom. Put your finger over the hole and fill the cup halfway with water. Hold the cup over a sink or trash can. Lift your finger from the hole. What happens? Do the experiment again. Place your finger over the hole. Fill the cup halfway with water. Drop the cup and watch what happens. (Answer: The water and cup fall at the same rate and no water escapes.)
- Have student travel to the library and find a book about gravity. Read the book and report to the class. Examples: Lucky Starr and the moons of Jupiter by Isaac Asimov, A princess of Mars by Edgar Rice Burroughs, The light princess and other tales by George Macdonald.

References / Resources:

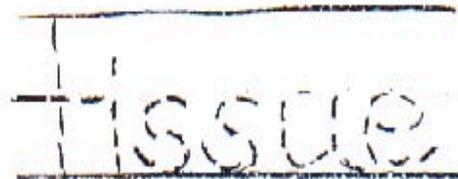
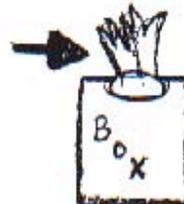
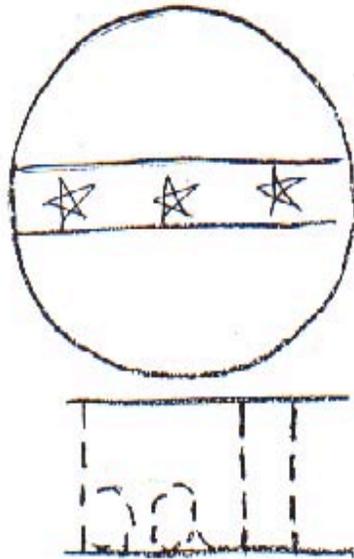
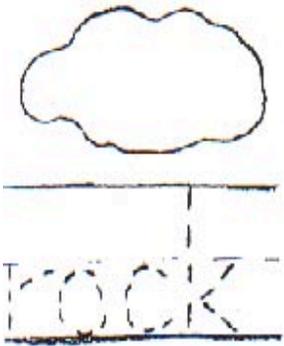
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<http://www.hcc.hawaii.edu/hccinfo/instruct/div5/sci/sci122/newton/Gravity/unilaw.html>
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Lab Worksheet

Look At Me, I Know Gravity

Color the items that all fell at the same speed. Put an "X" through the item that fell slower.



GRAVITY AND ME

by Margaret Allen

When I'm playing in my backyard,
I pretend to try to fly,
I swing up high in my swing set,
But I don't fly, and I know why.

G-R-A-V-I-T-Y!

Gravity, it pulls me back down,
Every time I swing up high.
It's the force that keeps us on earth.
It's the reason I can't fly.

G-R-A-V-I-T-Y!

Birds and airplanes catch the currents
Of the wind as it goes by.
Wings and engines help to keep planes
From gravity's pull so they can fly.

G-R-A-V-I-T-Y!

So when I'm playing in my backyard
And I pretend to try to fly,
I swing up high in my swing set,
But I don't fly, and I know why.

G-R-A-V-I-T-Y!

Charlie Over the Ocean
Adapted by Margaret Allen

Charlie over the ocean,
Charlie over the sea.
Charlie dropped the anchor-
Oops! Down with gravity!

Down into the ocean,
Down into the sea.
Down went the anchor,
Pulled down by gravity!
