



Arts Education for Young People

## NEWTON'S REVENGE

### TEACHER GUIDE

#### Kupferberg Center Performances

The Teacher Guide provides background information, Learning Standards, and pre- and post-concert activities that coordinate with the performance and Student Guide to encourage learning across the curriculum. For your convenience, this guide is also available as a .pdf with direct links to all suggested websites. Visit

#### About The Artists

Founded in Montreal, Canada in 1985, the *Mad Science Group* provides live, interactive science programs to children in over 18 different countries through a network of more than 120 franchises. Through a blend of comedy and factual information, Mad Science introduces science as a part of everyday life to children in a way that makes science entertaining as well as educational. To discover more about the company, visit [www.madscience.org](http://www.madscience.org). For more background and science experiments, be sure to see their Teacher's Manual, which is posted on our website, in the "Teacher Guides" section: [www.kupferbergcenter.org/revelations](http://www.kupferbergcenter.org/revelations).

#### CURRICULUM CONNECTION: SCIENCE

NYC Science Standards: 1a, 1b, 4d, 5f, 8a, 8b

NYS Physical Education Standard: 1

Coordinates with Student Guide: "Newton's Laws of Motion"

Mini-Lesson: Perform this experiment to illustrate Newton's First Law of Motion: "An object at rest will remain at rest if no outside forces act upon it, and an object in motion will continue in motion in a straight line at constant speed unless a force acts upon it."

Experiment: Car Crash

NOTE: Download "Mad Scientist's Teacher Manual" from our website for more experiments and for a prediction chart.

Materials: 1 small toy car with a flat top; small doll or action figure that will fit on top of the car; heavy wooden block, no taller than the height of the car; experiment log.

Whole class: Place the car on a table or desk for all to observe.

- *Ask*: is the car able to move by itself?
- *Predict*: What will happen if you push on the back of the car?
- *Record* predictions on a chart.
- *Action*: Push on the back of the car.
- *Observe* and record results.
- *Compare* results to predictions.
- *Evaluate*: How does this activity illustrate Newton's First Law of Motion? (The car remained where it was, until it was pushed or moved in some way.)

*Small Groups*: Record observations. Each group will predict what will happen to the doll sitting on top of the car when the car is pushed toward a block. This prediction will be the *hypothesis*, or best guess of what will happen. *Procedure*: Each group will sit their doll on top of the car and push the car toward the block. Record observations. Repeat the experiment three times, recording the results. You may want to measure how far the doll fell from the car each time and create a line graph to illustrate.

*Variation*: Roll the car down a ramp. How do the results change?

*Results*: An object that is in motion stays in motion unless a force acts to slow it down or stop it. In this example, the block is the force that stops the car but not the doll, which continues to fly through the air until

gravity brings it to the ground. Objects in motion stay in motion until they are forced to change their movement by another force like gravity or friction.

## CURRICULUM CONNECTION: LANGUAGE ARTS

NYC ELA Standards: 1c, 2c, 5b

Coordinate with Student Guide: "Truth Is Stranger Than Fiction"

Mini-Lesson: Create A Story Using Comic Strip Format.

*Teaching Point:* Action is drawn; dialogue appears in "bubbles;" narration appears below.

Use the cartoon characters introduced in the Student Guide, or let children imagine their own characters, depicting Motion, Friction, Inertia, etc. Write a story that demonstrates one or more of the Laws of Motion in action/adventure style. Publish work in a class comic book.

Activity: Write A Newspaper Article

### HERO SCALES BURNING BUILDING TO SAVE NEIGHBOR

BY MIKE JACCARINO and BILL HUTCHINSON

DAILY NEWS STAFF WRITERS

Sunday, August 19th 2007, 4:00 AM

A courageous Brooklyn man climbed a burning building yesterday to rescue a 71-year-old neighbor screaming for help from a second-floor window. Sequiere Blanc, 53, braved flames and thick smoke to pluck Walter Alston to safety just seconds before the Farragut house was devoured by the blaze.

"It's amazing," said Alston's grateful son-in-law Eddie Karim, 36. "I don't know what to say. I thanked him so much. When someone told me he saved my father-in-law, I broke down in tears."

Blanc, a housekeeper at New York-Presbyterian Hospital Columbia, was relaxing and watching TV in his Brooklyn Ave. home about 9 a.m. when his wife told him Alston was in grave danger.

"I saw flames and smoke and a man on the window," said Blanc's wife, Marie. "I knocked on my door and told my husband come help this man."

Blanc rushed outside and saw the billowing smoke and flames closing in. Alston had one foot out his second-floor window, but he was frozen in fear.

"Flames were coming out of the next window. I said to myself I've got to go faster to catch him," said Blanc, who immigrated to New York from Haiti in 1988. The 5-foot-7, 185-pound rescuer scaled a porch awning, pulled Alston from the window, put the heavy-set man on his back and climbed down to safety without a second to spare.

"I pulled him down and the flames went *whoosh*," said Blanc, explaining how the fire consumed the window Alston had been in just seconds after the rescue. "I feel happy because I saved a life."

Alston was taken to Kings County Hospital, where he was in stable condition and being treated for smoke inhalation. The cause of the two-alarm fire, which took 75 firefighters about 90 minutes to extinguish, was under investigation. Blanc was a modest hero, insisting he just did what any good neighbor would have done. When a soot-covered firefighter shook his hand and told him "good work," Blanc responded: "No problem."

*Whole Group:* Read this *Daily News* article to the class, or copy and distribute for reading aloud.

*Individual work:* Imagine you are a journalist reporting on the latest exploits of Motion Man, Friction Filly or Captain Inertia. Using the article we just read and the comic strip you wrote for inspiration, write a newspaper article reporting on their actions.

*Teaching point:* A journalist gathers facts then reports them in an interesting way. You can make your article more interesting by pretending to interview and quote the people involved as in the *Daily News* article, which

added the quotes to make the facts more interesting to the people reading it. Don't forget to make an eye-catching headline!

*Share:* Read your articles to the group.

*Extension:* Publish the articles in newspaper-style format. Come up with a name for your paper, such as "The Hero Rag."

Activity: Write a Motion Poem

Coordinate with Student Guide: "I Like to Move It, *Move It, Move It*"

*Mini-Lesson:* Verbs.

*Whole class:* Create a chart of motion/action words – verbs – elicited from the group. Provide clean copies of the poem "Running Song" by Marci Ridlon and read it aloud.

*Individual work:* Underline all the action words you find in the poem. Compare your work with a partner. Using motion words, or action words (verbs), create your own poem. Look at the class chart and the poem for inspiration.

*Teaching point:* Although *Running Song* observes a rhyming pattern, you can choose to write your poem in free verse. You may want to experiment with repeating words as Ridlon does so effectively in her poem. How about trying to include some of your new vocabulary words like *inertia*, *force* and *friction*?

### **Running Song**

by Marci Ridlon

I am running, running,  
running.

I am running  
just for fun.

Through the grass  
and through the gravel  
running faster  
see me travel  
past the people  
staring, staring.

They are thinking  
something's wrong.  
I'm not looking.  
I'm not caring.  
I'm just running.  
Hard and long.

Now my feet are pounding pavement.  
Now my heart is pounding, too.  
I can feel the sidewalk searing  
through the bottom of my shoe.  
How the wind is  
whipping past me.  
How the trees are  
whizzing by.  
Rushing rivers  
run forever.  
Maybe I can  
if I try.

*From 20<sup>th</sup> Century Children's Poetry* ed. Jack Prelutsky. Knopf, 1999

## **CURRICULUM CONNECTION: ART**

Blueprint for the Arts: Visual Arts: Art Making; Making Connections

NYC Arts Standard: 1

Coordinate with Student Guide: “Truth Is Stranger Than Fiction”

Activity: Create your own cartoon versions of Motion Man, Friction Filly and Captain Inertia. Illustrate your comic strip story.

### **CURRICULUM CONNECTION: DANCE**

Blueprint for the Arts: Dance: Dance Making; Making Connections

NYC Arts Standard: 1

Coordinate with Teacher Guide: “Curriculum Connection: Music”

*Whole Group:* Explore Newton’s Laws of Motion through movement. Ask teams of two to demonstrate by pushing hands together, pushing apart, one person pushing another who is still, making them move in a straight line, etc.

*Small Groups:* Demonstrate one of the Laws of Motion through body movement, working together. Use various levels (high, low, medium) to make your dance interesting.

*Share:* Perform your dance piece for the class to music you’ve selected.

### **CURRICULUM CONNECTION: MUSIC**

Blueprint for the Arts: Music: Music Making; Making Connections

NYC Arts Standard: 1

Coordinate with Teacher Guide: “Curriculum Connection: Dance”

*Small Groups:* Create sound effects for your dance piece. Use simple or homemade instruments, or instruments that students play. Have some people perform the dance while other members of your group perform the sound effects.

*Brainstorm questions:* Consider what sounds you would make to describe: inertia; an object creating enough force to make another object begin moving; a moving object; an object that hit something that created enough force to stop it; an object caught between two opposing forces.

### **CURRICULUM CONNECTION: SOCIAL STUDIES**

NYC Social Studies Standard: 1

Activity: Research And Report On Isaac Newton and His Discoveries

#### **BOOKSHELF**

##### **Grades 1 to 3**

*Why Doesn't the Earth Fall Up? And Other Not Such Dumb Questions about Motion* by Vicki Cobb. Scholastic, 2001.

*The Magic School Bus Plays Ball :A Book about Forces* by Joanna Cole. Scholastic, 1988.

##### **Grades 3 up**

*Horrible Science: Fatal Forces* by Nick Arnold. Scholastic, 2007.

*A Scholastic Kids Encyclopedia of Science* by David Rubel. Scholastic, 1995.

*Forces and Motion: Science Projects* by Simon De Pinna. Enslow, 1998.

*Forces and Motion: Science Fair Projects Using Water Balloons, Pulleys and Other Stuff* by Robert Gardner, Library Binding, 2004.

*Lucky Science: Accidental Discoveries from Gravity to Velcro* by Royston Roberts. Jossey-Bass, 1994.

*The Spinning Blackboard and Other Dynamic Experiments on Force and Motion* by Paul Doherty, Don Rathjen and the Exploratorium Teacher Institute. Jossey-Bass, 1996.