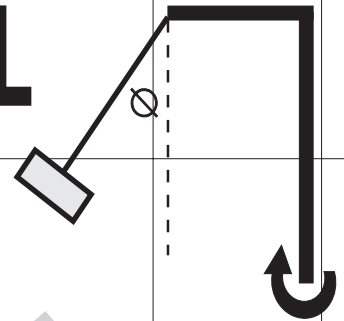


# MIDDLE SCHOOL PHYSICAL SCIENCE



## Seabreeze Park -- Rochester NY

*Come join Upstate NY teachers and students for an exciting "hands-on" learning experience. Discover how the major park rides provide an excellent backdrop for teaching the principals of science.*

**Background:** In the 1970s The University of Houston received a grant from The National Science Foundation for an informal science study. Materials designed as a result of this study presented mathematics and science within a framework of fun activities. "Physics in an Amusement Park" was part of their original work and has since been adapted by many for specific parks.

**Classroom Experience:** Custom labs and demonstrations have been developed by local teachers, samples of which are available through our website. These materials are available to all participating classes. Used before coming to the park, these labs will acquaint students with a variety of concepts like centrifugal and centripetal force, potential and kinetic energy, friction, acceleration and inertia.

**The Event:** Custom worksheets for different rides have also been developed for in-park or class room use; the lab link on our website shows a sample. At Seabreeze students can ride each of the assigned rides and complete the corresponding worksheet before proceeding to the next ride...or save the labs to do back in class.

**The Date:** Physical Science Day is usually scheduled for late May, on Physics Day, but the labs are designed to be used on whatever day works best for you. Dates fill up fast. Check out our calendar link to see what's available and act soon to get the day you prefer.

**Information:** Contact the Group Sales Department: (585) 323-1900, toll-free at 1-800-395-2500 or [groupsales@seabreeze.com](mailto:groupsales@seabreeze.com). They'll give you more information, tell you about our catered lunch option, explain how chaperones can participate for free, and reserve a spot for you.

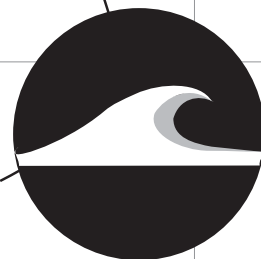
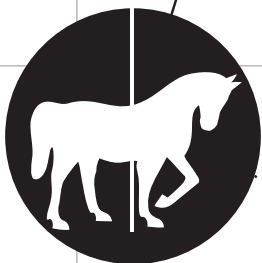
**MAKE YOUR RESERVATION TODAY FOR PHYSICAL SCIENCE!**

# SEABREEZE PHYSICAL SCIENCE

**Seabreeze Park  
Rochester NY**

*Prepared in Cooperation with*

**Greece Athena Middle School  
Rochester NY**



# SEABREEZE PHYSICAL SCIENCE IN-PARK EXERCISE



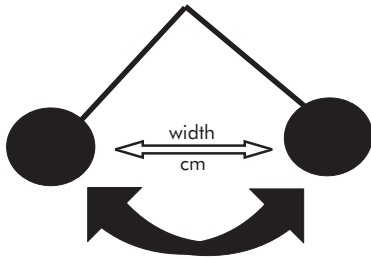
## BUMPER CARS 1A



1. The bumper cars have rubber bumpers because
  - (1) it is cheap
  - (2) it absorbs much of the impact
  - (3) it reduces the sound
2. The cars get their energy from
  - (1) a gasoline engine
  - (2) momentum from previous collisions on a frictionless floor
  - (3) an electrical potential difference between the ceiling and the floor
3. The electrical sparks from the ceiling are from
  - (1) friction
  - (2) faulty wiring
  - (3) an electrical potential difference between the ceiling and the floor makes a current flow
4. We do not see the exhaust coming from the bumper cars as we do from real cars because
  - (1) the exhaust comes out beneath the car
  - (2) It is changed into an invisible gas
  - (3) the power for the car comes from electrical energy and not from gasoline combustion
5. If the power suddenly stops, the car
  - (1) continues moving in the same direction until friction brings it to rest
  - (2) stops suddenly
  - (3) changes direction until friction brings it to rest
6. If the floor is made of ice instead of metal, when the power suddenly stops, the car would
  - (1) slide farther
  - (2) not slide as far
  - (3) moves the same distance it comes to rest
7. If you hit a car ahead of you, you
  - (1) are thrown backward
  - (2) are thrown forward
  - (3) move with the car
8. If the car ahead of you is going faster than you in the same direction, the distance between cars
  - (1) increases
  - (2) decreases
  - (3) remains the same
9. If the car behind you hits you, you
  - (1) are thrown forward
  - (2) are thrown backward
  - (3) move with the car
10. When you rapidly step on the accelerator, you
  - (1) lunge forward
  - (2) are thrown backward

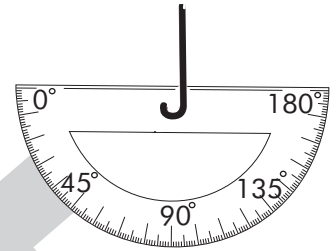
# SEABREEZE PHYSICAL SCIENCE IN-CLASS EXERCISE

## Pendulums



### Materials:

- String
- Steel washers or nuts(different weights)
- Stop watch or watch w/second hand
- Ruler, meter or yardstick
- Scale (optional)



**Objective:** To study the effect of the length and weight of a pendulum.

**Introduction:** A pendulum is a suspended weight free to swing between two extreme points. Galileo was the first scientist to study the movement of a pendulum. His interest began while watching a chandelier swing from the ceiling of a cathedral. The experiments Galileo conducted were similar to what you will now do.

**Experiment:**

1. Cut the string into 3 different lengths: 2 meter, 1.5 meter and a 1 meter.
2. Securely fasten or tie one end to a hook, plant hanger or shelf that is higher Than the length of string.
3. Tie one of the washers or nuts to the other end.
4. Make sure your pendulum can swing freely without hitting any objects.
5. Make a chart to record your findings:

LENGTH (m)	NUMBER OF WEIGHTS	WIDTH OF SWING (cm)	TOTAL TIME 1 SWING	TIME OF 10 SWINGS
---------------	----------------------	------------------------	-----------------------	----------------------

6. Record the length of string used and the number of weights used.
7. Move the weight to one side and let it go.
8. Time and record how long it takes for the pendulum to make 10 complete swings. (One complete swing is from the starting point to the other side and back again.)
9. Carefully measure and record the distance between the two extreme points.
10. To get an average for the swings: Divide the total time by 10 and record the Average time for one swing.
11. Using the same length of string, change weights and repeat #7 - #10.
12. Secure your second length of string and repeat #6 - #10.
13. Secure your third length of string and repeat steps #6 - #10.

**Interpretation:** According to your findings:

- a) Does the length of string change the time for one complete swing?
- b) Does the weight affect the time for one complete swing?

# **SEABREEZE PHYSICAL SCIENCE IN-CLASS EXERCISE**

*The Seabreeze Middle School Physical Science program is currently being updated. The extensive and comprehensive 18-page classroom workbook and companion in-park test modules are getting new layouts and some format changes.*

*For the most up-to-date info on the status of the Physical Science program materials, contact your Group Sales representative today!*

**SAMPLE**