

Swingin' Systems

In school, the children have explored pendulum systems to discover which variables affect the number of swings that the pendulum will make. In this activity, you and your child will investigate the variable of weight.

WHAT YOU NEED:

- several pennies
- masking tape
- centimeter tape measure
- scissors
- watch or clock with a second hand
- one string for each person involved in the activity (60 cm long)
- one paper clip for each string.
- pencil

WHAT TO DO:

Help your child follow these steps:

1. Tie a loop at one end of each string and tie a paper clip at the other end. Each participating family member prepares a string and chooses the number of pennies, 1, 2, 3, or 4, that he or she will suspend from the string. (Make sure that the distance between the loop and the paper clip is the same for all of the strings.)
2. Tape the penny or pennies to a paper clip.
3. Slip the loop around the eraser end of the pencil.
4. Tape the pencil to the end of a table so that it extends 8 cm from the table.
5. Set the string in motion by raising the penny to the height of the table and dropping it.
6. Count complete swings (back and forth) for 20 seconds.
7. Record the results on the chart.
8. What do you notice about the relationship between the number of pennies and the number of swings?

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	0	1	2	3	4

NUMBER OF PENNIES

SUMMARY: By observing the results on the chart you should be able to determine if the variable of weight affects the number of swings which the pendulum makes.

EXTENSIONS:

Further Investigations:

1. Which of these variables will affect the number of swings the pendulum makes?
 - length of the string
 - height at which you begin the swing
 Can you think of other variables to test?
2. Locate examples of pendulums around you.

Literary Connections:

- Ardley, Neil. *The Science Book of Machines*. New York: Harcourt Brace Jovanovich, 1992.
- Macaulay, David. *The Way Things Work*. Boston: Houghton Mifflin, 1989.

Related Web Sites:

- <http://www.arts.richmond.edu/~rubin/pedagogy/111/pendulum.html>
- <http://www.howstuffworks.com/clock2.htm>