Names _____ Date _____ Period _____

5 Conceptual Graphing

Purpose

To make qualitative interpretations of motions from graphs.

Required Equipment/Supplies

sonic ranger
computer
masking tape
marking pen
ring stand

Discussion

Have you ever wondered how bats can fly around in the dark without bumping into things? A bat makes squeaks that reflect off walls and objects, return to the bat's head, and are processed by its brain to give clues as to the location of nearby objects. The automatic focus on some cameras works on very much the same principle. The sonic ranger is a device that measures the time that ultra-high-frequency sound waves take to go to, and return from, a target object. The data are fed to a computer, where they are graphically displayed on the monitor. Data plotting software can display the data in three ways: distance vs. time, velocity vs. time, and acceleration vs. time.

Check sonic ranger.

Procedure

Step 1: Your teacher will set up the sonic ranger and the computer for you. Check to see that the sonic ranger appears to be functioning properly.

Step 2: Place the sonic ranger on a desk or table so that its beam is chest high. A floor stand is very useful for this purpose, if available. Affix 5 meters of masking tape to the floor in a straight line from the sonic ranger, as shown in Figure A.