

Name _____ Date _____ Class _____

Non-Contact Forces Demonstrations: Instructions

- A. Gravity Demonstration (15 minutes):** Use a pencil, three paperclips, and some string to show how paperclips are affected by gravity. Conduct the following two tests:
- 1. Test #1 (7.5 minutes):** The restriction for the first test is that the paperclips must hang from one of the ends of the pencil. Record your observations and the characteristics of your design. Create a drawing of your design for reference.
 - 2. Test #2 (7.5 minutes):** The second test is a “free design.” You can arrange the paperclips in any way you want with the materials given. Make notes of your observations and create a drawing of your design for reference. Then, compare both designs (**Test #1** and **Test #2**).
- B. Magnetism, Gravity, and Distance Demonstration (20 minutes):** Follow the instructions below and note your observations as you create your model. If possible, reuse the paperclips and string from the “Gravity Demonstration”.
1. Place three magnets along a metal ruler. (If you are using a wooden ruler, you can tape the magnets to the side that will be facing downwards.)
 2. Suspend the ruler from two stacks of blocks, books, or other materials (the stacks need to be high enough that another ruler could fit vertically between the surface and the ruler with the magnets). Make sure the magnets are facing down.
 3. Thread strings through three paperclips. Take one paperclip and hold it until it is just suspended below the first magnet. Tape its string in place on the table (or whatever surface on which your activity is taking place). Repeat this process with the other two paperclips.
 4. After taping the strings in place below the magnets, remove the ruler with the magnets and observe what happens. Write down your observations. Which forces are acting on the model now? How?
 5. Put the ruler with the magnets back above the paperclips. Slowly lift each paperclip toward each magnet until they are all suspended. Which forces are acting on the model now? How?
 6. Write a sentence comparing the behavior of the forces and create a drawing of your design for reference.