EPS, Ball-sorter Project Specification: Part I

Assignment: You are given two types of balls. Both are ½ inch in diameter but one is made of steel and the other of plastic. Your job is to design and build a device which sorts out two types of balls automatically. In a sense it is like a coin sorter which you see in banks or can/bottle sorter in recycling centers but much more economical.

Constraints: Each team is provided with one steel ball and one plastic ball for the testing purpose. For construction, you may use cardboards, paper clips, staples, rubber bands, tapes and other items that can be readily purchased at a drug store, supermarket or electronic shop. The cost of all items should not exceed $5.00. Teams will be expected to include an itemized expense list as a part of their project reports if necessary.

Deliverables: The testing is on 10/10 or 10/12. A written report is due on 10/17 or 10/19. In testing, 5 steel and 5 plastic balls will be fed into the device randomly and the number of correctly sorted balls will be recorded. Exploit the differences, e.g., weight, conductivity, magnetism, color... and be creative and inventive! Return the balls immediately after the demonstration.

Material: Cardboard: You can find and use cardboard boxes in recycle rooms, 4329SC/3329SC. Paper clips, staples, rubber bands: Please go to 4016SC office for help.

Here are some examples
http://www.engineering.uiowa.edu/~eng_0055/2018/video/example.wmv

Part II

Suppose you have three types of balls, steel balls of ½ and 3/8 inch in diameters respectively, and plastic balls of ½ inch in diameter. Steel balls are heavier than plastic balls. Design (no need to build) a device that sorts out three types of balls automatically. Presentation is on 10/17 or 10/19.

The written report MUST HAVE the following elements and each element is assigned separate credits.
• For part I, summary of the overall approach taken by the team
• Description of any research/background work carried out by the team
• Rationale for selecting the chosen design
• Each member’s contribution.
• For part II, describe your design in details including sketches so others can understand. Explain and justify your idea and design in class presentation on 10/17 or 10/19.