Charging by Friction Activity: The Amazing Race

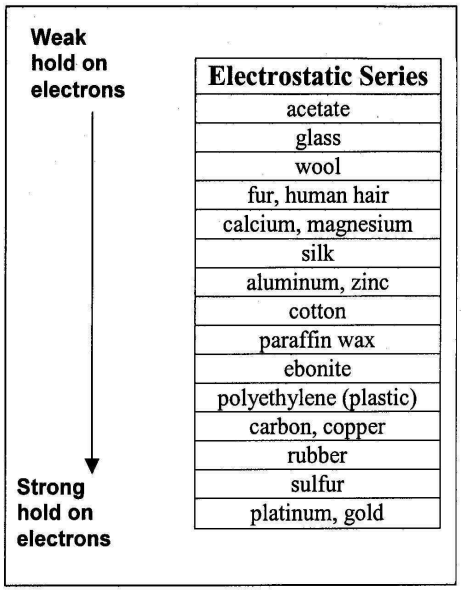
Task:

Your task is to roll a pop can as quickly as possible over level ground using only electrostatics and the method of charging by friction, without hitting, blowing on, or applying any other external force to the pop can.

Materials:

You and your team will be given an empty aluminum pop can.
You and your team will choose from ONE (1) of the following: polyethylene rod, ebonite (hard rubber) rod, glass rod.
You and your team will choose from ONE (1) of the following: wool, fur, a plastic bag, silk.

TRIBOELECTRIC SERIES TABLE



Electrostatic Series
acetate
glass
wool
fur, human hair
calcium, magnesium
silk
aluminum, zinc
cotton
paraffin wax
ebonite
polyethylene (plastic)
carbon, copper
rubber
sulfur
platinum, gold

Prediction:

What combination of rod and rubbing materials do you think will give you the best results? Clearly explain why you think so.

Clearly explain what kind of charge (positive or negative) the rod material you choose will have after charging by friction. Refer to the triboelectric series as part of your explanation.

Draw electrostatic diagrams for the rod of your choice and the pop can **before** charging the rod by friction, and **after** charging, to demonstrate the interaction between rod and can. Use 8 protons and 8 electrons for neutral objects. For charged objects, add 4 more particles of the appropriate charge.

A) **Before** Friction

B) **After** Friction

Neutral _____ rod
Neutral aluminum can

Rod: _____ charge
Aluminum can: _____ charge