

Half Full Monty

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The Half Full Monty demonstration is a variation on the Three Card Monty which illustrates the forces of air pressure. It is also amusing when done to music. I use the song, "The Hustle," by Van McCoy.

To make the equipment follow the directions below:

- 1) Purchase .5 liter, clear plastic, flat bottomed bottles from the supermarket. Bottled water bottles work well.
- 2) Cut a large hole in the base, leaving a 1/4 inch lip. Hot glue a nylon mesh circle to the bottom of the bottle. Nylon mesh is screening material.
- 3) Cut or melt a 1/4 inch hole into the bottle neck.
- 4) Cut 3 inch diameter PVC pipe into lengths about 2 inches shorter than the bottle height.
- 5) Use a 3 inch hole saw to cut a 3 inch Plexiglass circle and glue the circle to the PVC pipe with "GOOP brand Marine Adhesive & Sealant" (buy it at Home Depot) Allow time for the sealant to dry.

Performing the demonstration:

- 1) Fill all the PVC containers $\frac{3}{4}$ full with water.
- 2) Gently place the bottles, with the caps securely fastened, into the PVC containers.
- 3) Show the audience that there is water in **one** of the bottles by holding your finger over the hole in the neck of the bottle and lifting it up. Show there is no water in the other 2 bottles by leaving the hole open when you pick the bottles up.
- 4) Tell them to "keep your eye on the bottle with the water in it," while you move them around.
- 5) Ask them to tell you which bottle contains the water. Show that they are wrong by covering the hole on a different bottle when you take it out of the PVC container. Continue doing this 2 more times.
- 6) The final time you ask them which bottle contains the water, don't cover any holes. All the bottles will appear empty.

For a variation that you can replace one of the bottle caps with a colored bottle cap and ask them to follow it as you move them around. When you lift the bottle out of the PVC don't cover the hole, and this one will appear empty too.

It's lots of fun and the students are really puzzled. Enjoy!

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