Five Minute Demos

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1. Oldest demonstration. Cut off the bottom from a small plastic bottle, an the top from a larger plastic bottle. Full the larger bottle halfway with water. Place a cork or other floating object in the water. Tighten the lid on the small bottle and lower it over the cork. This is how the ancient Greeks proved that air is matter, not empty space.
2. You need a narrow tank with a divider. Add red food coloring to about 250 mL of hot water and blue food coloring to about 250 mL of cold water. AT THE SAME TIME, pour the two liquids into the two sides of the tank. Remove the divider to allow the water to mix (It doesn't!) (Don Showalter and Marv Lang)
3. Place water colored yellow into a container. Carefully add a layer of alcohol colored blue.
4. Place ice cubes in water and in a separate container of alcohol.
5. Place ice cubes in tap water and in saturated salt solution. Extension: place an egg in the saturated salt solution. Alternate – place ice cubes in vegetable oil and watch what happens as they melt.
6. Archimedes principle. Suspend a block of wood from a sprig scale and note the reading on the scale. Lower the wood into a container of water and observe the reading. Repeat with a block of plastic or similar material whose density is slightly larger than 1 g/cm^3.
7. Boat in the canal. Place a cup (the boat) which contains a number of washers or other small objects into a larger container of water (the canal). Mark the level of water on the side of the larger container. If the "boat" tips over and spills its load into the canal, will the water level rise, fall, or remain the same? What if the load is wooden balls, instead of washers?
8. Place metal shot in a test tube, so that it will float in water and not tip over. Stopper the top. Place in water, then in alcohol. Could this be used as a gauge to determine the density of the liquid?
9. Magic popcorn. Place a steel sphere into a container of popcorn. Cover and shake vigously, changing the steel ball into a ping pong ball. (Brian Rohrig)
10. Boyle's law and the marshmallow. Place a marshmallow in a large plastic syringe (NO NEEDLE!) Push the plunger halfway in, then cap the end. The size of the marshmallow changes as the plunger is moved in and out.
11. Cartesian divers with Fizz-Keeper pump. (Educational Innovations or Flinn)
12. Pressure/mole relationship. Fill a plastic soda bottle halfway with water. Cover with the Fizz-Keeper. Hold upside down and pump more air in. Observe pressure changes.
13. Cloud in a bottle. Wet the inside of a plastic soda bottle. Light a few wooden splints on fire, and allow the smoke to enter the bottle. Cover with the Fizz-Keeper, and pump for at least one minute. You will notice that the temperature goes up as the air is compressed. Release the pressure and watch a cloud form. (Brian Rohrig)
14. Ice cubes on wooden and metal blocks. (Educational Innovations)
15. Float a Japanese yen on the surface of water. Add a drop of dishwashing liquid.
16. Streak race. Use cotton balls of Q-tips to streak the surface of a blackboard with water, alcohol, acetone, etc. Compare rates of evaporation.
17. Compare viscosity of water, alcohol, corn syrup, vegetable oil by shaking their bottles and seeing how long it takes the bubbles to disappear.
18. Oil and water don't mix! Randomly drop regular marbles and magnetic marbles into a container. Shake well to show that the "polar molecules" stick together.
19. Place water on a plate or dish, and sprinkle pepper on the surface. Put a drop of dishwashing liquid on your finger and touch the surface of the water.
20. Conservation of energy. Drop "happy" and "sad" balls and popper and compare bounce height.
21. Throw a color changing ball into the air to demonstrate activation energy.

22. Rusty balls – thermite reaction. Hit two heavy rusty balls together with a piece of paper in between them. Show that the paper is charred. Wrap one ball with aluminum foil, and hit them together.
23. Place ½ of an Alka Seltzer tablet in a Fuji film canister, add water, and snap the cap firmly inot place.
24. Light sticks. Darken the room. Place a red light stick against a piece of phosphorescent plastic. Repeat with a blue light stick. "Write" on the plastic with an LED flashlight.
25. Reactions in a bag. Place calcium chloride dihydrate, sodium chloride, and sodium hydrogen carbonate in a zip-lock bag. Add 10 mL of indicator and fasten the bag shut.
26. Place a some rubber stoppers, marbles, or other suitable objects in a graduated cylinder. Add water to the mark. Then place water to the mark and add the marbles. Compare molarity and molality.
27. Rate. Have two students throw Nerf balls at you to show how hard it is to get a three body collision.
28. Shine a flashlight or laser beam through water, a cornstarch suspension and a gelatin colloid.
29. MOM. Mix universal indicator, water, and milk of magnesia in a beaker. Add acid (Vinegar or HCl) slowly and observe the color chages.
30. $NaHCO_3$ in water. How many observations can be made from this simple demo?
31. Draw a message on goldenrod paper with a piece of wax. Spray with Windex or sodium hydrogen carbonate solution.