MIND TREKKERS
Lycopodium Powder Glove Lesson Plan

Amount of time Demo takes: 1-3 min
# time per hour: 25
Container: small bin

Materials
1. 1000 ml beaker (1)
2. 50 ml beaker (1)
3. Water (600ml/demo)
4. Lycopodium Powder (sprinkle/demo)
5. Safety Goggles (1)
6. 250 ml beaker
7. Water bucket
8. Powdered sugar

Set up instructions:
1. Fill the 1000 ml beaker 3/4 full of water.
2. Sprinkle a thin layer of lycopodium powder on top of the water.
3. Fill the 50 ml beaker full of water and put it into the large beaker so that is upside down.
4. Fill 250 ml beaker with water, add powdered sugar to show contrast to lycopodium powder

SAFETY!
- Wear safety glasses. Work in a well ventilated area.
- Lycopodium is very flammable; if present in the air at a sufficiently high level it could cause an explosion if a source of ignition was introduced.
- Eye contact: Flush the eye with water. If irritation persists, call for medical help.
- Skin contact: Wash off with soap and water.
- If swallowed: Unless the quantity swallowed is large, no harmful effects are likely.

Lesson’s Big Idea
- **Hydrophobic Solutions:** Lycopodium powder will not mix with the water because it is hydrophobic or water hating.
- **Polarity:** Actually the water is polar, and the powder is non-polar. These properties mean that the two substances will not dissolve or mix with each other. The molecules of the powder try to stay away from the molecules of the water.
- **Density:** The powder is mostly less dense than the water and will float on the top.
**Molecules:** When you stick your hand into the powder and water, the force of your hand makes the powder particles stick to your fingers and push the molecules of the water away; therefore the powder is like a water repellent.

The spores from Lycopodium have a high fat content which makes them very hydrophobic.

Fatty molecules don’t like to interact with water

**Instructional Procedure**

1. Put a coin on top of the upside down beaker.
2. Push three fingers into the powder, and wiggle around a bit so everyone can see, and pull them straight out. There will be powder on your finger, but no water. To prove this snap your fingers and watch the dust fly.
3. Repeat to pull out the coin.

**Clean Up**
Clean up between demonstrations if needed. When completely finished gather all materials listed for this demonstration and make sure everything is accounted for. If something was used up, broken or damaged. Let someone know so it can get replaced or fixed.

**References**
http://cartwright.chem.ox.ac.uk/hsci/chemicals/lycopodium.html
P:\Youth Programs-General\Hands-on Activities\Pdf files

**National Standards:**
K-4 Content Standard B: Properties of objects and materials
5-8 Content Standard B: Properties and changes of properties in matter
9-12 Content Standard B: Structure and properties of matter