MIND TREKKERS

Bubble and PVC Pipe Lesson Plan

Amount of time Demo takes: 2-3 min
Container: small bin

Materials:
1. Pan for mixing the bubble solutions
2. Bubble solution
3. PVC pipe
4. Bright light source
5. Arched lead brick

Set up instructions:
1. Fill tray with bubble solution
2. Place PVC pipe in solution
3. Take out and look at the film.

SAFETY!
1. Paper towels to clean up, just in case of spills.

Lesson’s big idea bullet points

- Interference is the result of multiple waves adding together and forming new wave patterns.
- The soap bubble acts as a thin film, a layer of material that has a thickness proportional to the wavelength of the light. Some of the initial light is reflected off of the first layer and the rest is refracted (separating the white light into its constituent colors) and passes through the film to the second layer. At the boundary of the second layer the light is refracted and reflected again.
- The reflected waves off of the two boundaries are no longer in phase (because the light travels a different distance in a different medium, the light that travels through the film is slightly delayed) and recombine constructively and destructively (the waves can become amplified, muffled, or canceled at certain points). This is known as interference.
- The thickness of the bubble is never constant which is why we see the interesting patterns on the surface of the bubble.
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:
Interference, Refraction

National Standards
K-4 Content Standard B: Physical Science, Light, heat, electricity and magnetism
5-8 Content Standard B: Physical Science, Transfer of energy, Motions and forces
9-12 Content Standard B: Physical Science, Interactions of energy and matter