

Name \_\_\_\_\_

## Bubbles and Light

### Background Information:

Vocabulary to know:

**Fringe** - A light or dark band made by the interference of light.

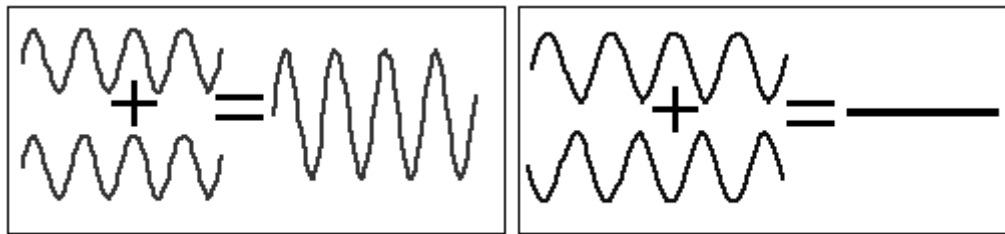
**Interference** - The addition or coming together of several waves (can be light, sound, or water waves).

**Light** - Electromagnetic radiation visible to the human eye.

**Wave Crest** - The top or high point of a wave.

**Wave Trough** - The bottom or lowest point of a wave.

- Light travels in waves
- Sometimes, two or more waves join together.
- Interference is the addition, or coming together, of several waves.
- Constructive Interference happens when two or more waves come together to form a larger and stronger wave, matching their crests and troughs.
- Destructive Interference is when two or more waves come together and cancel each other out to make a weaker wave.



**Constructive Interference**

**Destructive Interference**

<http://www.reachoutmichigan.org/funexperiments/agesubject/lessons/bubbles.html>

- Since light has wave properties, it will experience interference (the addition of waves).
- This interference is like that seen with water waves.
- Whether you get constructive or destructive interference depends on the wavelength (color) of the light.
- White light is made up of many colors. These different colors have different wavelengths.
- We can see the many colors of light on bubbles.
- The separation of white light into many colors on a bubble happens because of interference.

**Materials:**

Bubble solution	Straw	Water
-----------------	-------	-------

**SAFETY!** Clean up any solution from the desk and floor when you are finished with this investigation. Wet floors can cause accidents.

**Procedure:**

1. Use a little of the bubble solution to wet your table.
2. Dip the end of your straw into the soap solution and blow a bubble on the wet part of your table. You may have to practice a few times to get the hang of it.
3. Observe the bubble, paying close attention to the colored *fringes*. A white strip of paper can be bent around the bubble to help see the fringes.
4. Keep making bubbles. Watch the color patterns on the bubbles.
5. Describe the color pattern you see on the bubbles in the data section.
  - a. The colors you see on the bubble are the reflection of white light shining on the bubble film. White light has many colors—each color has a different wavelength.
  - b. If the crests of two sets of waves meet, the colors will intensify and you see evidence of **constructive interference**
  - c. When the crest of one wave meets the trough of another wave, the waves cancel each other out and you see **destructive interference**.
  - d. As a bubble film thins out, the colors cancel each other out until all you see is a black dot in the middle of the bubble.

**Data:**

Describe what you see in the bubbles:

- a) Do you see the fringes? What do they look like?
- b) Why do you think there are many colors? What makes the dark bands?
- c) Can you see evidence of constructive interference? Destructive interference?
- d) What are the fringes doing?
- e) What determines what the fringes look like?
- f) What happens when the bubble gets old (before it pops)?

---



---



---



---



---



---

