

# “The Mysterious Glowing Ball”

## Additive Color Mixing in Time



### To Do and Notice:

Turn the light on by twisting the battery plug clockwise. Describe what you see once the light is on.

Now place two fingers from one hand through loops on the cord. Making sure there is enough room on either side, above and below you, swing the ball in a vertical circle in front of your body. People in front of you will observe the results. Now have someone else swing the ball so you can watch the ball as it moves.

- What three colors do you see when the ball is motion?
- What does this tell you about the colors needed to produce white?
- Why do you suppose all three colors behave as if they were “on” all the time when the ball is stationary even though the lights are blinking?

### What’s Going On:

When the ball is spun in a circle, one can see the white light separate into blinking red, blue, and green lights, the additive primary colors. When the ball is at rest, the combination of red, green, and blue light makes white.

To the eye/brain system, the three colored lights seem to remain on when the ball is stationary, even though each is blinking. This is due to the ability of our visual system to retain the impression of a light for a short time after the light has disappeared. This physiological phenomenon is called *persistence of vision*. This effect is familiar to anyone who has ever looked into a camera flash.

Besides additive color mixing by overlapping red, green and blue lights, it is also possible to obtain most colors, including white, by placing the primary colors so close to each other that the eye cannot see them as separate. This type of additive mixing, sometimes referred to as optical mixing, is used in the production of images by color TV tubes and computer monitors and also by

**pointillist painters such as Seurat.**