

## Flashing Lights

Flashing lights can be used to cause the stroboscopic effect. **The stroboscopic effect is an optical illusion caused by bright flashing lights shining on something moving with a rhythm, or defined spacing in time** [1]. The human brain perceives the flashes as tiny freeze-frames in time, since there is only a brief moment to see when the lights are on. The timing of the flashes shining on moving objects can be used to trick the brain into thinking time is reversing or gravity has stopped working, but it is only an illusion!

One example of stroboscopic motion would be lights flashing on drops of water coming out of a kitchen sink in a dark room [2]. If the flashes happened just a little faster than the drops, the second flash drops are a little above where the first flash drops are, like in the photo. If we continue this with more very rapid flashes, like with a strobe light, the human brain will think the drops are moving up! This is just an illusion, and **each flash shows an entirely different drop**.



Instead of flashing lights, **many neighboring lights turned on and off in sequence may also be used to create the feeling of movement**. In this case, there is no actual movement, but many lights turning on and off in a complex pattern trick the brain into feeling movement anyway [3]. For instance, LED lights which move in a spiral pattern in a dark room can make people feel like they are spinning even when they are standing still!

[1] Miller, Naomi. "Flicker Basics". [www.energy.gov](http://www.energy.gov). US Department of Energy. Retrieved 15 January 2025

[2] Finio, B. (2023, April 29). *Build a Levitating Water Fountain with the Stroboscopic Effect*. Retrieved from

[https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys\\_p120/physics/stroboscopic-effect-levitating-water-drops](https://www.sciencebuddies.org/science-fair-projects/project-ideas/Phys_p120/physics/stroboscopic-effect-levitating-water-drops)

[3] Melissa Hogenboom (30 January 2015). Richard Fisher (ed.). "How Your Eyes Trick Your Mind". *BBC Future*. Daren Newman (illustrator). BBC. Archived from the original on 6 June 2017. Retrieved 6 August 2017.