

Spark in the Dark!

If something gives off light because of high temperatures, scientists call it incandescence. Luminescence, on the other hand, describes something that emits light without heat. Triboluminescence is a kind of luminescence, specifically describing something that gives off light because it was smashed or torn.

Most hard, sugary candy is triboluminescent. When the crystal structures of the sugars crash together, electrons fly into the air, producing ultraviolet light. Ultraviolet light, however, is invisible to humans. Thus, we often do not see the light produced when we eat hard candy.

We can observe triboluminescence only when something absorbs the ultraviolet light and re-emits it as visible light. We see the spark from the Wint-O-Green Lifesaver™ so well because of a specific ingredient called methyl salicylate (oil of wintergreen). Methyl salicylate is fluorescent, which is visible to humans!

Materials needed:

- Fresh roll of Wint-O-Green Lifesavers™ (must be exactly that product, not sugar-free or individually wrapped)
- Strong teeth (avoid braces or dental crowns)
- Dark room
- Mirror or an activity partner



Step-by-step instructions:

1. Unwrap the roll of mints.
2. Go into a dark room.
3. Place one mint in your mouth.
4. Face the mirror or your activity partner.
5. Chomp down hard on the mint while keeping your mouth as open as possible.
6. What did you or your partner observe?

Additional explorations:

- Striking small pieces of quartz against one another also produces triboluminescent sparks. Read more about it and watch a short video: <https://geology.com/minerals/triboluminescence/>

Discussion questions:

- If the experiment did not work, why? What could you do differently?
- Do you think other candy would produce the same light spark? Why or why not?
- Why should we care about luminescence? What can we gain from this knowledge?

Additional resources:

Tribonet.org: About Tribolgy

<https://www.tribonet.org/wiki/triboluminescence/>