

Hot Science

Superhero Science



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Cool Activities

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About Superheroes

Dr. Raychelle Burks explained how triboluminescence happened when Thor hits his hammer on Captain America's shield in the Avengers movie. Try this experiment at home to see triboluminescence in a smaller scale.

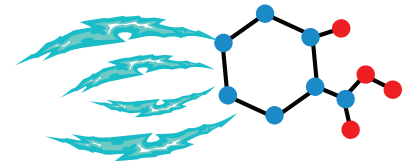
You Will Need

- Wintergreen Lifesavers (must use this specific flavor)
- Hammer or pliers (if you prefer not to use your teeth)
- Mirror

What To Do

If you are using your teeth:	If you are using a hammer or pliers:
1. Dry the inside of the mouth with a paper towel.	1. Place the lifesaver on a hard surface.
2. Stand in front of a mirror. The darker the room, the more you will be able to see the effect. Consider turning the light off!	2. The darker the room, the more you will be able to see the effect. Consider turning the light off!

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Questions to Ask

3. Place 1 wintergreen lifesaver in between your teeth and crunch down. If you can't see it in the mirror, take turns with a friend or a family member so each of you can see the reaction occurring!

Do not let anyone else touch your lifesaver and be mindful of loose teeth!

3. Crush the lifesaver with a hammer or between the jaws of the pliers. To catch the reaction, you can use your phone to record the reaction.

Whichever process you use, try it several times.

What do you think might be causing the light?

Triboluminescence is the release of light that can happen when a mechanical disturbance (like Thor's hammer hitting Captain America's shield or your teeth hitting a lifesaver mint) happens. Some materials made up of crystals deform under a mechanical disturbance. After the deformation, the material returns to its more stable original state.

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Lifesaver Activity

Terms to Know

- **Molecules:** A group of two or more atoms that are joined (or “bonded”) tightly together.
- **Atoms:** A basic building block of matter.
- **Mechanical Energy:** The energy of an object that is moving or has the potential to move.
- **Sucrose:** Also known as table sugar, it is the most popular sweetener used worldwide. This type of sweetener is present in most fruits, some root vegetables, many trees, and grasses.

What is similar between our lifesaver activity and Thor’s Hammer hitting Captain America’s shield?

The difference in energy (between the deformed state and the object’s original state) is released and absorbed by surrounding molecules, thus exciting their electrons.

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These newly excited electrons return to their original state and release the difference in energy as visible light!

TEKS used in this activity
Science, Grade 6: 4A; 11C
Astronomy, High School: 2H
Earth and Space, High School: 2H; 2I



Comic Book

A. Biting down on the life saver creates mechanical energy.

B. This mechanical energy momentarily deforms the sucrose crystals.

C. When these sucrose crystals return to their original shape, the extra energy is released.

D. The energy is absorbed by nitrogen in the air and then released.

E. This energy is the light we can see.

F. The energy is absorbed by Methyl Salicylate (the minty flavor) and is released.