



## Indoor Night Hike



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4-H Youth Development

(If you live out in the country where there aren't street lights you can do this outside! If not, just find a super dark room at your house and do it!)

- Try not to use regular light!! If you have something red you can put over a flash light or phone light do it. The red light doesn't ruin your night vision
- Read through the activity and then head into the dark room and complete the tasks!!
- Try to pick a room with a mirror for the lifesaver activity. A bathroom is perfect!
- You can do this by yourself, or have your parents/guardians/siblings/adult help you, by reading through the activities as you do them!

**Before you start, read through your activities, and then go into your dark space and let your eyes adjust!**

**Also, Do each activity without reading the explanation, and once you're done, read the explanation for each, once you have returned to the light!**

**Don't You See It?** The human eye can see colors remarkably well during the day. Although our night vision is not as good as most nocturnal animals, our eyes are still able to adjust amazingly well to changes in light levels. These activities demonstrate some of the differences in how our vision works in light and dark conditions.

### 1. Light and Color

- Once in the dark room, take your colored pieces of construction paper and try to guess what color they are. Share your guess with a family member!
- Make sure **NOT** to peek in the light before you guess!!!

**Explanation:** Colors are nearly impossible for humans to see at night. We have two types of cells in our eyes called rods and cones. Rods are light sensitive cells helpful with seeing at night and cones allow for seeing in color. Humans have many more cone (color) cells than rod (night vision) cells; therefore, our color vision is great (during the day) and our night vision is poor. The only other animals that can see colors nearly as well as humans are diurnal (active during the day) birds. How do we know this? Many female birds choose their mates by the bright coloration of the males. Owls on the other hand, have mostly rods in their eyes so their low-light vision is very good.

You can remember cone cells are color cells by remembering both starts with the letter "c". When you go from light to dark, both cells are busy arranging themselves so you can see well. The rod cells adjust to allow more light to enter the eye. The cone cells arrange themselves so that they are not very important at night. This process usually takes about 10-20 minutes. Finally, your **NIGHT VISION** allows you to see amazingly well.



## 2. Lifesavers

- Take a wintergreen lifesaver (Provided) and put in your mouth
- If you are with someone else in your dark room, face each other and chew with your mouth open!
- If you are by yourself, look in the mirror and chew with your mouth open!
- What did you see?

**Explanation:** The lifesavers will spark. Why? The sparks, are essentially bolts of lightning in your mouth. Plenty of other substances (most you wouldn't want to put in your mouth) also give off light when they are rubbed, crushed, or broken.

This is called triboluminescence (try-bo-loom-in-es-cents; 'tribein' means "to rub" in Greek). Some crystals of quartz and mica triboluminesce. So does adhesive tape when torn from certain surfaces. (Have you ever peeled a wrapper off of a Band-Aid in the dark? Try it!) When sugar is fractured (in the case of chewed lifesavers), separate patches of charge, either positive or negative, form on the new surfaces or on opposite sides of cracks. The difference in charge compels electrons to leap across the gap, back and forth, and neutralize the patches. When these jumping electrons come in contact with nitrogen in the air (our air is 78% nitrogen), they cause the nitrogen to emit tiny blue-white bolts of light at the same wavelength as natural lightning. A simple way to explain this phenomena is when the sugar crystals break, they release a weak burst of ultra-violet energy. This energy excites the molecules of the wintergreen oil in the lifesavers and causes the oil to glow, or fluoresce. A similar effect can be seen when two pieces of quartz are struck together.

## 3. Listening activity (you can do this one outside at night if you like, the lighting doesn't matter for it)

- Stay very quiet in the dark room. Listen closely to what you may hear!
- You may here other people talking, the heat or air running, or maybe someone is running water!
- Do you hear anything less noticeable? Is a floor creaking? Maybe a rustle outside?

**Explanation:** Animals rely on their hearing at night just as much as they do their night vision. If we were outside, at night we might hear things like nocturnal (Night active) animals. These include bats, owls, deer, mice, raccoons, and flying squirrels! You may also hear trees creaking, running water and leaves crunching. Next time you are outside, sit very still and use those ears! You will be amazed at what you may hear!