



**The World As We Know It ( A Cognitive Health Story)  
(4<sup>th</sup> Grade – 9-10 yrs.)  
Demonstration: Do You See What I See?**



**STORY CONNECTION – SLIDE 8 (Approx Time: 15-20 mins)**

Different animals “see” different things based on the types of sensory receptors they have. We have 3 types of cones and one type of rod, and we can see the entire rainbow of colors that are a mix of red, green, and blue (rgb). Our television sets take advantage of this information and use only red, green, and blue subpixels to make the colors we see on tv. Dogs only have 2 types of cones – so they see the world in shades of blue and yellow. This means that things that are important to dogs staying alive can be seen with mixing blue and yellow. Chickens have 4 types of cones – so they see more colors in their rainbow!!! Chickens must lead a very colorful life!

**Materials needed:**

- People Versus Animal (included below)
- How Do Other Animals See the World? Website:
  - <https://www.nhm.ac.uk/discover/how-do-other-animals-see-the-world.html>
- Equipment to show digital pictures/website

**Preparation needed:**

- Preview and familiarize yourself with the images and website

**Instructions:**

1. In this activity, student(s) will get to see many examples of how various animals see the world.
2. Begin by reviewing the information from the story about cones and rods or humans, dogs, and chickens.
  - People have 3 types of cones and one type of rod, and we can see the entire rainbow of colors that are a mix of red, green, and blue (rgb).
  - Dogs only have 2 types of cones – so they see the world in shades of blue and yellow.
  - Chickens have 4 types of cones – so they see more colors in their rainbow!!!
3. Using the images below, ask student(s) to make some predictions as to how they think the animal might see the image differently than people do. Have them answer out loud.
  - Some student(s) might have prior knowledge of this based on books they have read or programs they have watched. Others just might be making guesses. All are okay.
4. Next, open the website for all student(s) to see.
5. Use the slider feature to transform the image from how a person sees it to how each specific animal sees it. Make sure to share the information below each image with the student(s). This information will help them better understand the science behind the differences in perception.

6. In closing, review with the student(s) that different animals “see” different things based on the types of sensory receptors they have. The world as we know it varies depending on what type of animal we are. Regardless, our sensory receptors, in this case vision or seeing, allow us to function in the world by keeping our body and brains safe and healthy.

## People Versus Animals

### Birds

PEOPLE



BIRDS



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Birds have 4 types of cone cells in their eyes, while humans only have 3. Not only can they see more colors than we can, but **they also see ultraviolet**. Because of this, when looking at a blackbird, for example, another bird might see them as colorful. That said, no 2 birds are alike. Only a few birds, for example, canaries are believed to be able to see blue.

PEOPLE



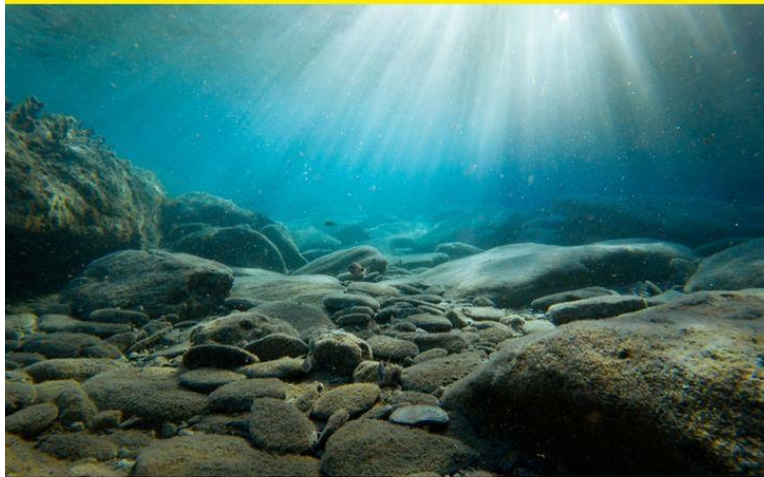
CATS



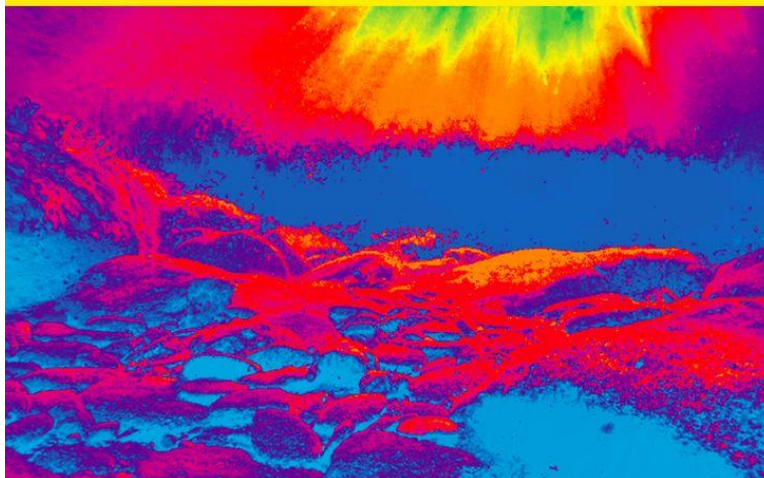
Cats have more rods in their eyes than we do, allowing them to **see in poor light**. The world looks much blurrier to cats than to humans, but they have a larger visual field, meaning they see more at once than we do. For comparison's sake, we can see 180 degrees around us, but cats see 200 degrees around themselves.



PEOPLE



SHRIMPS



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The [mantis shrimp](#) might just have one of the most complex eyes known to man: they have up to **16 photoreceptors and their filters divide ultraviolet light into distinct colors**. Given how colorful the shrimp already looks to us, one can only imagine what they look like to others of their kind!

PEOPLE



GOATS



If you have ever looked at a goat, you might have noticed something special about their eyes: they have rectangular pupils. This allows them to have a better depth sense and improved peripheral vision. Their split pupils also control how much light they take in, helping them to both **see better in the dark, but not be blinded by the sun** during the day.

## Scorpions

### PEOPLE



### SCORPIONS



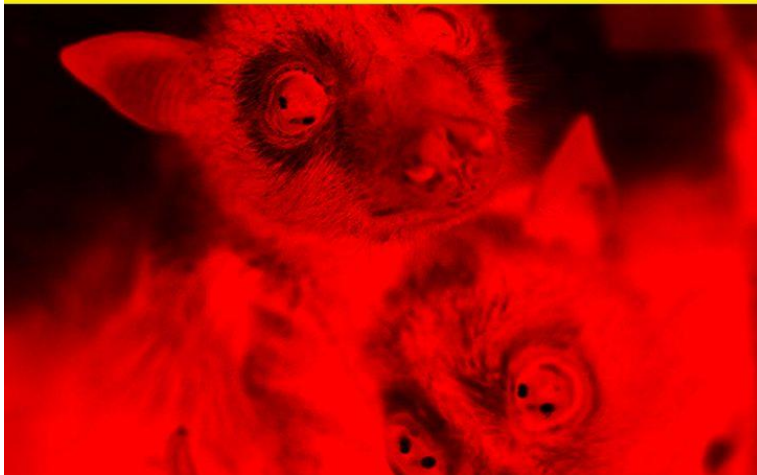
©

Scorpions often have 2 eyes in the front, but they do not stop there: they can have up to five extra pairs of eyes on the side! Do not forget, they are arachnids, like spiders. Despite having so many eyes, their eyes only can **sense** the difference **between darkness and light and possibly movement**. That said, it all varies by species, some scorpions do not have eyes at all!

PEOPLE



BATS



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Despite the old saying, bats are not actually blind. It is true that they use their ears to find food in a process called echolocation, which allows them to “see” in the dark, but they still use their eyes for daily activities and social interactions. What a bat sees, however, varies by species: many are **completely color-blind while others can see certain colors** thanks to proteins in their eyes. Some of them can even see red, a color a lot of animals cannot see at all.



## PEOPLE



## MOLE RATS



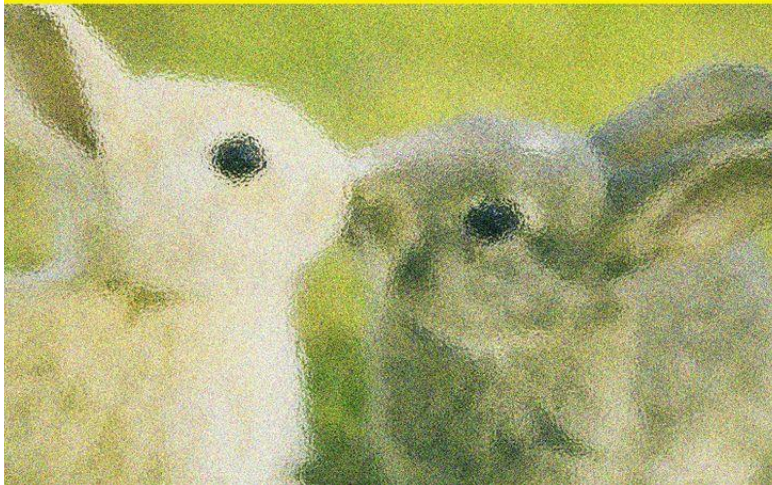
Mole rats do not have much use for their eyes, as they live underground, but they can detect the difference between light and dark. Unlike true “moles,” most mole rats do have external, if extremely tiny, eyes, which might allow them to see color. Their eyes have some sensitivity to blue and greenish-yellow light, suggesting they are not truly colorblind, but they cannot see red, and it is unclear if they can **differentiate between the colors**. One exception, however, is the blind mole rat, whose eyes are indeed covered by a layer of skin and do not appear to react to light.

## Rabbits

PEOPLE



RABBITS



Like a lot of animals we talked about so far, rabbits cannot see the color red. Rabbits also have the pupil area in their eyes like humans do, but it is not indented like in people, which causes them to have **grainy vision**. Finally, because rabbits have eyes on the sides of their heads, they can usually see in more directions than people can.



## PEOPLE



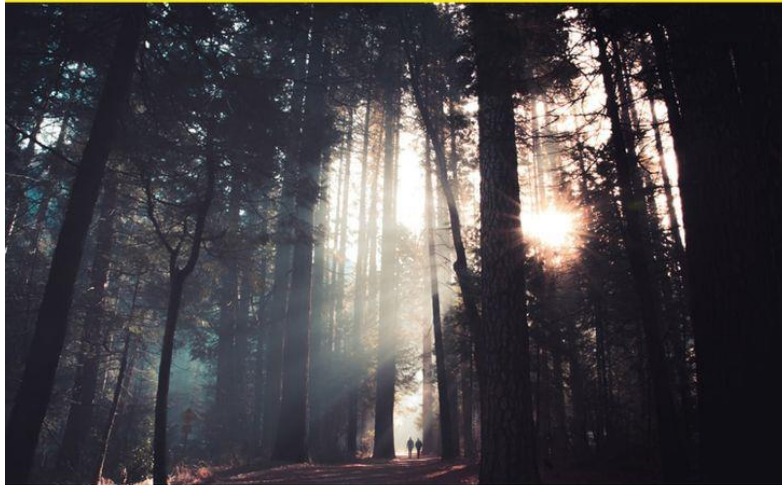
## SQUIDS



©

The colossal squid has one of the biggest eyes in the animal kingdom. Facing forward, their vision can be **compared to binoculars**. Thanks to their photophores, they can also produce light to help see prey in the dark.

## PEOPLE



## WORMS



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Many worms, especially earthworms, do not even have eyes to begin with, but whether they can “see” is complicated. They do have light receptors, allowing them to **tell the difference between darkness and light**. This helps them tell the difference between being above and below the ground.

Images and Information Credit: <https://brightside.me/wonder-animals/10-photos-that-show-us-how-animals-see-the-world-through-their-own-eyes-796649/>