

## Light & Shadows – Rainbow Shadows

Does a blue light have a blue shadow?

### Materials:

- Coloured pieces of cellophane (red, blue, green)
- Sun catchers
- Flashlight
- Tape
- Clear coloured glass or plastic objects
- White cardboard



**Procedure:** (Remember to have your parent’s permission and have them watch and help you.)

- Before you begin guess whether or not coloured light has coloured shadows.
- Tape pieces of colored cellophane over the flashlight so that the light will shine through the cellophane.
- Darken the room and see what colour of shadows the coloured lights make? Use the white cardboard as a screen so you can more easily see the colour of the shadow.
- Predict what you would see if you moved a blue shadow on top of a yellow shadow. Experiment and see what combining coloured shadows results in what colour of shadows. Remember to try to predict before you try.
- Shine a flashlight without cellophane through a colored sun catcher. What does this make?
- Find other pieces of colored glass or objects and shine the flashlight through them. Why does this make colors? Is this a shadow?
- Predict the result of overlapping red and green light, red and blue light, green and blue and finally all three red, green and blue. Did you get the colour you expected?

### What's Happening:

Why are shadows dark? Light hitting the objects is blocked. We perceive light travelling in a straight line therefore not lighting up the surface behind the object. Coloured light, like white light behaves the same way. A small amount of light is scattered allowing us to see some of the shadowed area with shading matching the colour of the light we are shining on it.

The primary colours for the additive colour system are red, green and blue. These three colours can create all the colours we see when light is emitted (given off). This actually is how your colour TV works. If you look very closely at your TV, perhaps with a magnifying glass you can see the three colours.

### Extension:

Put on a shadow play. Hang up a white sheet and darken the room. Tape the different coloured cellophane over multiple flashlights to cast coloured shadows on the sheet for your viewers that sit on the other side of the screen (the white sheet). The characters in your play can be you and your friends or family or even toys and action figures. Your villain could have a red shadow! You’ll want to have someone to help you hold the flashlights, the toys and created the “voices” in your play.

This activity is based on our Light & Shadows kit. The source for this lab is <http://cocopreme.hubpages.com/hub/shadowexperimentsandactivitiesforkids>. Our teaching kits (described on our website) are loaned out FREE to provide classroom teachers and parents of home schooled children an opportunity to explore Science in interesting ways. Please consider volunteering as a classroom guest speaker or offer your business as a field trip location.

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