LIGHT and COLOR Investigation
Not all shadows are black.

Part 1
Materials:
Red, green, blue bulbs, bulb holders, a screen, an object and an
index card with square cut out

3 Ways to introduce this activity
1. Predict what will happen.
The color of the shadows, the color of the screen and number of
shadows
Turn on all 3 bulbs and turn off overhead lights.
Have students discuss their observations.
2. Try to make the color yellow.
Students will explore using materials to determine how yellow is
created. Share ideas
3. Open investigation
Ask students to explore and develop ideas of what’s going on.

Part 2
Questions for discussion:
How are the shadows created?
What makes a shadow?
What are the 3 colors of bulbs?
What happens if only 2 lights are on?
What colors are the shadows?
What color is the screen, and how can you change the color?
What colors are mixing to create the new colors of shadows?
What’s going on?

Light travels in straight lines. The light source on the right is blocked by the object and creates the shadow on the left. The light source on the left is blocked and creates the shadow on the right. The light in the center is blocked and creates the shadow in the middle.
Primary or additive colors of light are red, green and blue. These colors when added together make white light.

Red + Blue + Green= White
Red + Blue + Green-Green = Magenta
Red + Blue + Green-Blue = Yellow
Red + Blue + Green-Red = Cyan
Cyan, Magenta and Yellow are the secondary colors or subtractive colors of light.

Why do we see color?
Colors are subjective sensations produced in the eye and brain by light of a particular wavelength, or by the combinations of different wavelengths. The sensation yellow can be produced by wavelength of light we interpret as “yellow,” or by a combination of light with wavelengths we separately see as “red” and “green.”

The color that we call “white” is a balanced mixture of all the wavelengths to which the eye is sensitive.

Follow up this explanation with Afterimages Activity – Bird in a Cage.
Also, see attached Colored Shadows activity – Snacks from the Science Exploratorium.