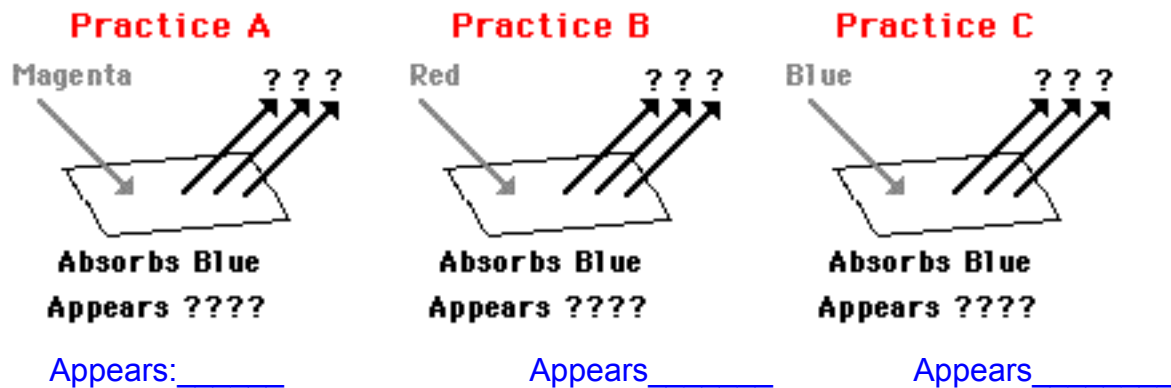


## 161A: Color Subtraction

To create colors, printers and artists use three main colors of paint to remove (absorb) unwanted colors.

1. Consider a cyan filter
  - a. which colors does it allow to pass?
  - b. Which color will it absorb?

Example 1:



Example 2: Magenta light shines on a sheet of paper containing a yellow pigment. Determine the appearance of the paper.

Answer: \_\_\_\_\_

Example 3: Yellow light shines on a sheet of paper containing a red pigment. Determine the appearance of the paper.

Answer: \_\_\_\_\_

Example 4: Yellow light shines on a sheet of paper containing a blue pigment. Determine the appearance of the paper.

Answer: \_\_\_\_\_

\*\*Check your answers here:

<https://www.physicsclassroom.com/class/light/Lesson-2/Color-Subtraction>

## 151B: Primary Colors of Paint

A trip to the local newspaper or film developing company will reveal these same principles of color subtraction at work. The three **primary colors of paint** used by an artist, color printer or film developer are

Each primary color of paint absorbs one primary color of light. The color absorbed by a primary color of paint is the complementary color of that paint. The three colors that are primary to an artist (magenta, cyan, and yellow) subtract red, green, and blue individually from an otherwise white sheet of paper. Thus,

Magenta paints absorb green light.

Cyan paints absorb red light.

Yellow paints absorb blue light.



Let's suppose that an artist wishes to use the three primary colors of paint in order to produce a picture of the colorful bird shown at the right. The bird will be painted onto white paper and viewed under white light. It is hoped that the bird will have green tail feathers, a blue lower body, a cyan upper body, a red head, a magenta eye patch, a yellow eye and middle feathers, and a black beak. **How can the three primary colors of paint be used to produce such a likeness? And how can we explain the answers in terms of color subtraction?**

green tail feathers, Example: apply C & Y

a blue lower body, apply

a cyan upper body, apply

a red head,

a magenta eye patch,

a yellow eye and middle feathers,

and a black beak