

“Science in a Bag” Activities

“Science in a Bag” activities are various types of quick science experiments with different topics and purposes. These experiments should be easy to perform, very low cost, have quick instructions, and a great to keep students engaged and learning. The idea behind a “Science in a Bag” activity is to be economically and environmentally friendly, and to keep with the tight budget teachers always have. These activities are easy to transport since all the materials should fit in a Ziploc bag. Having these “Science in a Bag” experiments on hand as a TOC can be a great addition to save a scary classroom. They are great tricks for teachers to have up their sleeves to keep students busy.

Activity 1: Highlighter Gummy Bears

Purpose: To see the effects of light reflection and absorption using two different wavelengths of light (green and red)

Instructions:

1. Set up the 2 red gummy bears beside each other and the 2 green gummy bears beside each other on top of a white piece of paper. (See figure 1 below)
2. Take the red laser pointer (button 1) and shine it on any one of the red gummy bears. Hold the laser pointer parallel to the paper and right against the bear. (See figure 2 below for HOW to shine it). What do you notice about the gummy bear?
3. Take the red laser pointer and shine it on a green gummy bear in the same way. What do you notice about the gummy bear?
4. Switch the pointer to the white light. (button 2)
5. Shine the white light on the red gummy bear, making sure you hold the light right against the bear. What do you notice about the gummy bear?
6. Now shine it on the green gummy bear. What do you notice about the gummy bear?
7. Compare your findings of the red light to the white light, based on what you saw on each colour of gummy bear.

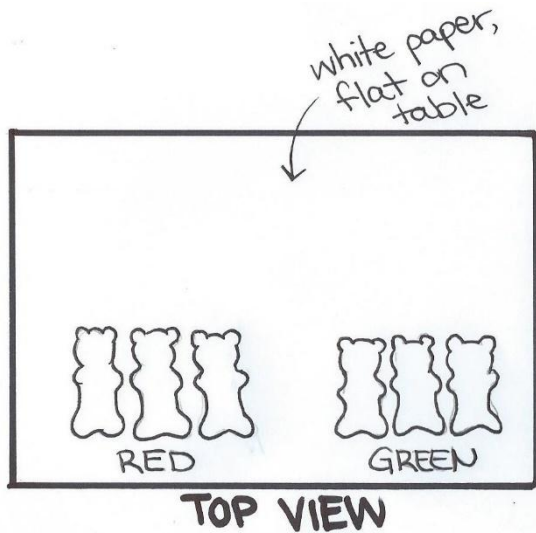


Figure 1

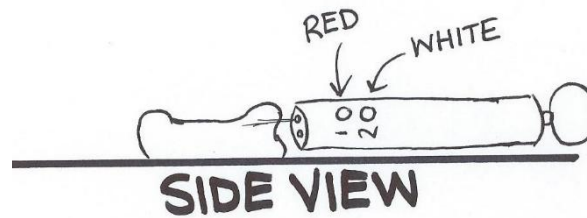


Figure 2

Materials:

- White paper (computer paper)
- Red gummy bear (x2)
- Green gummy bear (x2)
- Red laser pointer
- White LED light pointer

Explanation:

The gummy bears glow depending on the type of light that is being shone. Only certain wavelengths of light can be absorbed or reflected by each gummy bear.

The red colour from the red laser pointer has a certain wavelength of light. This wavelength of light is reflected by the red gummy bear or the colour red. That is why the gummy bear appears to glow. The colour red of any red object will reflect red light. It will absorb all other colours or wavelengths of light.

The red laser pointer does not make the green gummy bear glow. This is because the green colour of the gummy bear absorbs red light. The green gummy bear will absorb all other wavelengths of light, except for green light. This makes the colour green appears.

Colours appear by the wavelength of light they reflect. Colours that you cannot see are absorbed by the object. For example, if an object reflects the wavelength of the

colour orange, the object will appear orange. All other colours will be absorbed by the orange object, therefore not seen.

The white light is interesting because it makes both gummy bears glow. The white light contains all the colours. Therefore, each bear is able to reflect its own colour. This means that red reflects red from the white light and green reflects green. The red gummy bear absorbs all the other colours from the white light and the green absorbs all other colours except green.

Watch the video below for a demonstration:

<https://www.youtube.com/watch?v=ifWFeID9J8o>

Activity 2: Cartesian Diver

Purpose: to examine the effects of pressure and density in a contained system

Materials:

- 1 L or 2 L plastic bottle filled to the top with water
- Eye dropper filled half way with water

Instructions:

1. Fill the plastic water bottle with water to the top
2. Take the eye dropper and fill it half way with water
3. Put the eye dropper in the water bottle and tighten the lid shut
 - a. The eye dropper should be floating at the top of the bottle
4. Squeeze the sides of the water bottle and observe what happens
5. Squeeze the sides just hard enough to suspend the dropper in the center of the bottle

Questions:

1. What is the cause of the dropper sinking and rising as the bottle is squeezed?
Have students research the topic.
2. What real life situations does this emulate? Explain why and how.

Watch this YouTube video for a demonstration:

<https://www.youtube.com/watch?v=s5eIRjmor1w>

Activity 3: Concave and Convex Mirrors

Purpose: to see the effects and uses of convex and concave mirrors

Materials:

- Small mirrors (from the dollar store)

Instructions:

1. Hold the mirror in the sides and bend the edges towards you. What do you notice?
2. Now bend the sides away from you. What do you notice?
3. Compare your results from number 1 and number 2.

Questions:

1. Determine and define the differences between concave and convex mirrors.
2. What are real life uses of concave mirrors? Why are these used?
3. What are real life uses of convex mirrors? Why are these used?

Activity 4: The Black Box

Purpose: to investigate and use the scientific method to determine the contents in a black box

**Note: this experiment provokes curiosity and investigation among students; students can be as creative as they wish which keeps them engaged and interested*

***as a teacher you can put anything you wish into the “black box” for students to examine and predict*

Materials:

- Opaque film canister – black or dark coloured
- Cotton ball

- Paper clip
- Bead
- Staple

Materials may vary as you wish

Instructions:

1. Place 3 or 4 different materials into the film canister
2. Close the canister shut
3. Give each group of students one film canister (2-3 students per group)
4. Students are to perform any sort of experiment on the film canister
5. Students should NOT open the film canister
6. Students perform experiments and record their observations (ie. Sounds made, magnetic, weight, etc.)
7. Students make a prediction about what is found in the black box – draw picture of the inside of the box
8. Students can open the box AFTER everyone has made a prediction about what they think is in their box

This activity could take the whole class and students will love it!

Once students have made a prediction and shared with the class, the boxes can be opened. Ask the students to write down their thinking process in terms of the scientific method.

Activity 5: Static Combs

Purpose: to determine the effects of static electricity and explain electron movement

Materials:

- Plastic comb (dollar store)
- Small piece of cloth
- Three hole punch paper rounds

Instructions:

1. Rub the plastic comb aggressively with the cloth for at least 30 seconds
2. Bring the plastic comb close to long hair
3. Observe the results
4. Put the paper rounds on the table
5. Rub the plastic comb aggressively with the cloth for at least 30 seconds again
6. Bring the plastic comb to the hole punch paper rounds
7. Observe what happens

Questions:

1. Explain your predictions in terms of electron movement.
2. Draw a diagram of the comb, paper, and hair. Be sure to include electrons in the diagram.
3. Why is that that electrons move freely and protons do not?
4. How can one “charge” an item? (ie. How can one make electrons move?)

This is a great “box of tricks” to keep students busy, thinking about science, and having fun! Give these activities to students if they have nothing to do or need an extra thing to keep them occupied.