



Career Spotlight



Biological Engineer - Biological Engineers use Mother Nature as a tool in creating useful means that enhance everyday life. Bio-Engineers work to better the natural world through renewable resources and proper management of the environment.

Future Engineer's Take:

- Physics
- Math

How Biological Engineer's Benefit Agriculture:

- They help manage agricultural run-off
- Design tractors and harvesters



Farm Facts

- Chinese farmers were growing soybeans 5,000 years ago.
- Today, China uses more American soybeans than any other country.
- The U.S. produces 55 % of the world's soybeans and exports 1/3 of them.
- In the last decade Soybean production has increased about 25% each year.

Joke Answer
One. Once you add one the bag is no longer empty.

How many soybeans can you put in an empty bag?



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Meet Mr. Bean



In 1997, the first new crayon in nearly 100 years was produced by the Prang Company. The main difference between Prang crayons and regular crayons are the stuff they are made of.

The basic natural resource for regular crayons has been petroleum oil. Petroleum for wax crayons comes from oil wells which are mostly located over seas. Since humans can not make petroleum, there is a limited supply of this non-renewable resource.



The basic natural resource for Prang crayons is soybean oil. Soybean oil for Prang crayons comes from American farmers that grow soybeans. Farmers in 29 different states grow over 2 billion bushels of soybeans each year. America is one of the world's largest producers of soybeans. Since soybeans can be grown, they are a renewable resource.



In the production of Prang crayons, soybean oil provides 85% of the necessary ingredients. The soybean oil from one bushel of soybeans will make 2,112 crayons. One acre of soybeans can produce 82,368 crayons!

So, how do soybean crayons compare in performance and cost? Wax crayons cannot be blended since wax won't go over wax. Since there is no wax in soybean crayons, blending is easy. In tests done by children aged 3-10 years old, Prang soybean crayons were preferred because the soybean crayons were smoother, brighter, and are less flaky. Soybean crayons cost about 15-20% less than the leading brand of crayons.





What Do You Remember?



1. Fill in the chart below with information from the article you read.

Crayon Characteristics	Wax crayons	Soybean crayons
Main ingredient		
Renewable or nonrenewable		
Cost		
Brightness		
Flakiness		
Ability to blend		

2. What is the most interesting thing you learned about soybean crayons? Why?



3. Why would a crayon made from soybean oil be a better choice for our environment than a crayon made from petroleum oil?

Experiment with Color



Since Prang's soybean crayons can easily be blended, complete this experiment to see what new colors can be created by "blending" red, yellow, and blue!

Materials needed:

- Red, yellow, and blue food coloring
- Very warm water
- Cold water
- Clear plastic cups (6-8)
- Ice cube trays



Steps

1. Use the food coloring and cold water to make red, yellow, and blue ice cubes.
2. Allow the colored water to completely freeze into ice cubes.
3. Fill the plastic cups about half way with very warm water.
4. Put two different colored ice cubes in one cup of warm water. What new color is formed. Fill in the chart below.
5. Continue making new colors. Can you predict what color the two cubes will make?
6. What happens if you add a third color to the cup? What color do you get?

<u>red</u>	+	<u>blue</u>	=	<u> </u>
<u> </u>	+	<u> </u>	=	<u> </u>
<u> </u>	+	<u> </u>	=	<u> </u>
<u> </u>	+	<u> </u>	=	<u> </u>