



# Incredible Edible STEAM



# Dancing Gummy Worms

Ingredients:

1 Gummy Worm

3 Tbls Baking Soda

1 cup warm water

½ cup Vinegar



**\*\*Feel free to eat a couple of Gummy Worms from the bag during this experiment. You will not be able to eat this finished product.**

# Directions:

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1. Cut 1 Gummy Worm in half, and then cut each half lengthwise into 4 pieces (total of 8 pieces).



2. Measure 3 Tbls. baking soda into plastic cup.



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3. Measure 1 cup warm water and pour into plastic cup. Stir.



4. Add gummy worm pieces to water/baking soda mixture. Stir, then set aside for 30-45 minutes.



**Carefully set your cup aside for 30-40 minutes.**

# Edible Jell-O Slime

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## Ingredients:

- 1 - 3 oz box sugar free Jell-o
- 1 cup cornstarch
- ½ cup warm water



## Directions:

1. In a mixing bowl, combine cornstarch and Jell-o packet; mix well.
2. Slowly add water into the mixture, stirring with wooden craft stick or spoon the entire time. The mixture may be tough to stir, but continue to stir until the entire ½ cup of water is stirred in. If you need to add extra water, only add a drop or two at a time because the consistency will change quickly.
3. Play with your prepared Jell-o Slime on a sheet of wax paper.

Bring your Jell-o Slime home in a plastic bag and store in the refrigerator for up to a week. You may need to add a drop or two of water to the mixture after refrigeration.

# The Science Behind It

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First, let's learn about our ingredients. Both gelatin and cornstarch are used as thickeners; gelatin is usually used in desserts, while cornstarch is commonly used in gravies or sauces. While they both do the same job, they perform it differently.

Gelatin is a protein that comes from the collagen in animal skin, bone, or connective tissue. In order for gelatin to achieve its full thickening powers, it needs to be heated. Once it cools, it thickens, or gelatinizes.

Starch is a carbohydrate that comes from a variety of plants and grains, such as corn, potatoes, or rice. Cornstarch also needs to be heated in order to thicken foods. When starch is heated, the molecules swell and absorb water, making the food thicker or creamier.

While cornstarch and gelatin are different in some ways, both thickeners require heating to do their work. Cornstarch thickens food as it is heated, but gelatin thickens food as it cools.



# Homemade Ice Cream

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## Ingredients:

- ½ cup half and half
- ¼ tsp vanilla
- 1 TBSP sugar
- 3 cups ice
- ½ cup kosher or rock salt
- Gallon size zip top bag(s)
- Quart size zip top bag(s)
- Sprinkles



# Directions:

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1. In a gallon size zip bag; place ice and salt; set aside.
2. In quart size zip bag, mix together Half and Half, vanilla, and sugar. Close bag tightly.
3. Place smaller bag inside larger bag.
4. Shake for about 5 minutes.
5. Use gloves or pot holders if the bag gets too cold to hold.



# The Science Behind It

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Why does the bag get so cold? What's the chemistry behind ice cream?

In order to make your homemade ice cream, your ingredients need to get really cold and well frozen.

When you mix the salt and ice you are making a solution. Adding salt to the ice lowers the temperature at which water freezes. You will actually notice your ice melting as your ice cream ingredients start to freeze.

Shaking the bag allows the warm cream mixture to move around to allow for better freezing. Plus it also creates a little air that makes the ice cream a bit fluffier.



Is ice cream a liquid or a solid? Homemade ice cream changes states of matter, also more chemistry! It starts out as a liquid but changes to a solid in it's frozen form, but it can go back to a liquid when it melts. This is a good example of reversible change as it's not permanent.

**Now let's make our Gummy Worms dance!**

5.  
Measure  $\frac{1}{2}$  cup vinegar and pour into small clear cup.



6.  
Remove gummy worm pieces from water/baking soda mixture and place them into the vinegar to see them “dance.”



Note: If worms do not rise up into the liquid, try pouring a little bit of the water/baking soda solution into the vinegar/gummy worm cup.

# The Science Behind It

When you add the worms soaked in baking soda, the acetic acid in the vinegar reacts with the bicarbonate in the baking soda. When an acid and base react, carbon dioxide gas bubbles form. These gas bubbles form on the gummy worm and as the gas bubbles rise to the surface, they pull the gummy worm up with them, making them wiggle and dance.

# Jelly Bean Structure Challenge

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## Materials:

Jelly Beans

Toothpicks

## Challenge:

Each table has a box of 250 toothpicks and a bag of jelly beans. As a group, each table must work together to build a structure that will bear the weight of several books.

