



## SCIENCE FESTIVAL FACILITATOR'S GUIDE

### Martian Jelly

#### BEFORE THE EVENT

##### 1. Make sure you have the materials you need.

- Plastic table cover and paper towels to wipe up spills
- Large plastic cups (one for each student-adult pair)
- Grape jelly
- Baking soda
- Vinegar
- Pitcher of warm water (room temperature is okay)
- Plastic spoons (several to share)

##### 2. Watch this video on your smartphone:

<https://youtu.be/8KtUpvU-FCw>

##### 3. Prepare your station.

- Cover your table with plastic to protect it from sticky spills.
- Fill a pitcher with warm water (you or a helper will need to do this several times throughout the evening).
- Distribute plastic cups to each student-adult pair.
- Place shared grape jelly, baking soda, vinegar and spoons where they can be easily reached by all participants.

#### DURING THE EVENT

##### Questions to ask participants before they start:

- How do you think we could change the color of this grape jelly? (Let them brainstorm for a few minutes—remember, there are no wrong answers!)
- Do you think we could do it using chemistry?
- Let's find out!

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### Instructions:

Please read each set of instructions out loud. Make sure that you direct the correct person to complete each assigned task.

- **Student:**
  - Fill your plastic cup with warm water about halfway.
  - Dissolve one spoonful of grape jelly in the cup and note the color.
- **Adult:** Add a pinch of baking soda and stir. Be careful! A fizzing reaction will occur, possibly causing it to overflow.
- **Both:** When the fizzing dies down, what do you notice?
- **Adult:** Slowly, add 2-3 spoonfuls of vinegar. Take care not to let any vinegar splash—it can sting your eyes!
- **Student:** Stir until the color of the grape jelly solution changes again.

### How It Works:

Chemical reactions occur when one chemical comes into contact with another. For example, when you added the baking soda (a base), a reaction occurred and it made the solution *basic*, changing the color of the grape jelly to a greenish-black. When you added vinegar (an acid), a reaction occurred, and the color of the grape jelly solution changed back to purple.

### Vocabulary:

**Basic:** A solution is *basic* if it has a low concentration of hydrogen ions, or a pH of greater than 7. Some examples of basic things are soap, bleach, ammonia, and toothpaste.

**Acidic:** The opposite of basic is *acidic*—acidic solutions have a high concentration of hydrogen ions and a pH of less than 7. Some examples of acidic things are lemon juice, coffee, and soda.

### Real-World Application:

Neutral pH (not basic or acidic) is best for most living beings. The more acidic or basic a liquid becomes, the more irritating it is to our skin, eyes, and organs. For example, most household cleaners (bleach, oven cleaners and tub and tile cleaners) are basic. Many things we like to eat are acidic but can harm our stomach or damage our teeth in large quantities, like coffee or soda, or citrus juice. Knowing how to combine acids and bases is very helpful for baking and cooking and for scientists working with dangerous acids and bases.

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