

## YOU WILL NEED:

- 4 starch pellets** (biodegradable starch "packing peanuts" available at mailing supply stores)
- water**
- coffee filter**
- Tang® breakfast drink**
- vitamin C tablet**
- tincture of iodine solution**
- plastic cups** (two 8-oz and five 3-oz)
- measuring spoons**
- 3 droppers**
- orange juice**
- masking tape**
- pen**

**Do not drink any solutions.**

**1** Use the two 8-ounce cups to make your *starch solution*: Dissolve 4 starch pellets in 1/2 cup of water. Set up a coffee filter in the other cup as shown. Pour the starch solution through the filter. Label this cup **starch solution**.

**2** Label three of the small plastic cups **vitamin C test**, **Tang test**, and **orange juice test** as shown below. Add 1 tablespoon of starch solution to each cup.

**3** Now add 1 drop of iodine solution to each labeled test cup.

**4** Label your fourth cup **vitamin C solution**. Crush your vitamin C tablet and add it to 2 tablespoons water in this cup. Stir.

# Vitamin C Testing—

Which has more vitamin C: Tang® drink mix or orange juice? Chemistry and color can help you find the answer!

### CAUTION:

Be careful when using tincture of iodine. Read and follow all directions on the label. When finished activity, rinse out all cups and throw them away.

### TEACHER PREPARATION:

Make a solution by adding 1 teaspoon of tincture of iodine to 1 tablespoon water. Place about 1/4 teaspoon of this iodine solution into labeled cups so that each group gets one.





# Chemistry's Clear Solution!

The more vitamin C a solution has, the fewer drops it takes to turn the starch/iodine solution clear. So the fewer drops it takes, the more vitamin C the solution must have. Let's see whether Tang or orange juice has more vitamin C.

**5** Now place 1 drop of the **vitamin C solution** in the **vitamin C test** cup and swirl. What do you observe? If nothing happens, try adding another drop.



**6** Mix up some Tang<sup>®</sup> by adding 3/4 teaspoon of Tang<sup>®</sup> powder to 2 tablespoons of water in your fifth cup. Label this cup **Tang Drink**.



**7** Try adding 1 drop of Tang<sup>®</sup> drink to the **Tang test** cup. If it takes more than 1 drop to clear the solution, that means there is less vitamin C in 1 drop of Tang<sup>®</sup> than there is in 1 drop of your vitamin C solution. How many drops does it take?

**8** Now try adding 1 drop of orange juice to its test cup. What do you observe? How many drops of orange juice does it take for the solution to become clear? Which has more vitamin C, Tang<sup>®</sup> or orange juice?



## CHALLENGE

Try testing some other drinks for vitamin C, such as orange soda pop, lemon-lime soda pop, cranberry juice, or apple juice.