

**Activity 4.1****Defining Dissolving**

We keep lots of different drinks in our refrigerator. There's milk, juice, soda, and water. My parents even have carbonated water, which I never drink. The other day I was thirsty and took a look in the fridge. For some reason, nothing really interested me. I decided to mix some drink mix in water to make something different. The mix dissolved really quickly and made this purplish drink. It was pretty good. I thought that the mix might improve the carbonated water so I tried dissolving some in there. There was a lot of bubbling, and it didn't taste too bad. The mix dissolved well in water and in carbonated water so I was curious about whether it would dissolve in something else. I wasn't going to drink it, but I tried dissolving some of the mix in a little vegetable oil. I got a pretty interesting result. I wondered why things dissolve the way they do. I also wondered if I could use dissolving to make my own flavored soda.

**How can you tell when a substance has dissolved?****Take a closer look**

Two of the main ingredients in most drink mixes are sugar and coloring. You can do an activity to find out how well these ingredients dissolve in water.

**Does sugar dissolve in water?****Sugar**

1. Place about 1 tablespoon of room-temperature water in each of 2 clear plastic cups.
2. Add 1 teaspoon of sugar to one cup and swirl for about 10 seconds. Observe.
3. Swirl for another 10 seconds and observe. Swirl for a final 10 seconds and observe.



1. What did you observe when you swirled the sugar and water together?  
\_\_\_\_\_

2. What do you think happened to the sugar crystals?  
\_\_\_\_\_  
\_\_\_\_\_

## Student activity sheet

Name: \_\_\_\_\_

### Activity 4.1

## Defining Dissolving *(continued)*

### Does food coloring dissolve in water?



#### *Food coloring*

1. Gently place 1 drop of food coloring in the other cup of water. Observe.
2. Gently swirl for a few seconds. Swirl again for a few more seconds.
3. What do you observe?

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4. Do you think there is more food coloring in one part of the water than in another? \_\_\_\_\_  
What makes you think that?

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5. Do you think there is more sugar in one part of the water than in another?

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6. Based on your observations so far, how do you know when a substance has *dissolved*?

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## Student activity sheet

Name: \_\_\_\_\_

### Activity 4.1

## Defining Dissolving *(continued)*

### Do sugar and food coloring dissolve in oil?



#### *Sugar*

1. Place 1 tablespoon of vegetable oil in each of 2 clear plastic cups.
2. Add 1 teaspoon of sugar to one cup and swirl for about 10 seconds. Observe.
3. Swirl for another 10 seconds and observe. Swirl for a final 10 seconds and observe.

7. What do you observe?

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8. Would you say that the sugar dissolved in the oil? \_\_\_\_\_

Why?

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#### *Food coloring*

1. Gently place 1 drop of food coloring in the other cup of oil. Observe.
2. Gently swirl for a few seconds. Swirl again for a few seconds.



9. What do you observe?

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10. Would you say that the food coloring dissolved in the oil? \_\_\_\_\_

Why?

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Activity 4.1

**Defining Dissolving** *(continued)*

11. Even though a substance dissolves in one liquid, will it necessarily dissolve in another?

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Based on your observations in this activity, explain your answer.

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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. How can you tell when a substance has dissolved?

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\_\_\_\_\_  
\_\_\_\_\_

**What's next?**

You saw that sugar and food coloring dissolve in water but don't dissolve in oil. So we can safely say that just because one substance dissolves in one liquid, it won't necessarily dissolve in another. When a substance dissolves, it is broken all the way down to its molecules or ions. These are so small and so well-mixed that you can't see them and they don't settle to the bottom. In the activity, you also saw that solids, like sugar, and liquids, like food coloring, can dissolve. In the coming activities, you'll learn more about dissolving solids and liquids and see that gases can dissolve, too.