

## Celery Osmosis: Teacher's Guide

### 1. Scientific Method Handout:

This packet comes with a handout listing the steps of the scientific method. The purpose here is to introduce a method of investigation in which someone makes observations and answers questions about a specific problem. It's a multi-step process, so be sure to clarify each step as you review the handout. Here's a sample script:

*We read about osmosis earlier. Do you remember what osmosis is? It's how a plant drinks water by taking the water in through the roots at the very bottom and then carrying it all the way up to the top of the plant. First, there needs to be water-- it could be rainwater or water from a hose or water from a watering can. Whichever it is, the water needs to soak into the ground for osmosis to begin. Once it's down in the ground, the roots "drink" the water. Then, the water travels through the roots into the stalk/stem/trunk. After that, the water continues to travel out to smaller branches and leaves. The water travels through tiny tubes, similar to how blood travels through our veins.*

*Based on what we know about osmosis, what do you think will happen if a plant drinks colored water? Do you think we may be able to see the colored water in the stalk of the celery? Will we see it in the leaves? Where do you think we will see the colored water first? Why?*

### 2. What you will need:

- 3 (or more) fresh stalks of celery with plenty of leaves on top\*
- 3 different colors of food coloring (one for each celery stalk)
- 3 jars or cups (one for each celery stalk)
- Water
- Knife for a fresh cut

*\*It's especially important that you cut each celery stalk immediately before putting it in the cup of colored water.*

*Without a fresh cut the stalk will struggle to take up the water.*

- Question ♦ Prediction ♦ Summary Chart
- Observation charts

*\*If you use smaller, thinner celery stalks, you'll notice the color showing up faster than if you use larger, thicker stalks. The larger the celery stalk, the longer it will take for the water to travel through it.*

### 3. Question ♦ Prediction ♦ Summary Chart:

#### 3.1. Question

Explain that every experiment must start with a question. If you don't have a question, then you don't have any reason to do an experiment. The question guides the experiment, the experiment itself is the way in which we try to answer the question. Guide your student(s) to think about how osmosis works, and lead them to ask: What will happen if celery stalks "drink" colored water? Write the question on the space provided. This is a good time to talk about different types of punctuation: question marks vs. periods

#### 3.2. Prediction

After writing down the guiding question, give them a moment to brainstorm ideas about what might happen. In a complete sentence, help them write their ideas in the space provided. Review capital letters for the first letter of the sentence, as well as periods to indicate a full stop showing the sentence has ended.

#### 3.3. Summary

After the Day 3 Observation Chart has been completed, explain that you now have the evidence you need to answer the guiding question from the first day. Revisit the question and their prediction. Then write a complete sentence about their findings. Explain how scientists use the summaries from experiments to share their discoveries with other people. Ultimately, using the scientific method helps us learn about the world around us by asking questions and using evidence to back up the answers to those questions.

4. **Observation Charts:**

This packet comes with five observation charts. Each observation chart has four pictures of celery stalks. If you're only using three celery stalks, just ignore the fourth picture. Here's how you will use the five charts:

4.1. **Day 1 Observation Chart**

First, help your child fill in the blank clockface to record the time at which each observation occurs. This is especially important for the first day to show progression. It also helps teach analog clock skills.

After recording the time, have your child look closely at each celery stalk. Guide them to notice the color of the stalks as well as the color of the leaves. After looking at, holding, and discussing their observations, have them color in the celery stalks on the first chart to show what they look like **BEFORE** they put them in the cups of colored water.

4.2. **Day 1 Observation Chart (2 hours after start time)**

After all three celery stalks have been in the colored water for a total of two hours, use this chart to record any changes.

4.3. **Day 1 Observation Chart: (4 hours after start time)**

After all three celery stalks have been in the colored water for a total of four hours, use this chart to record any changes.

4.4. **Day 2 Observation Chart:**

After all three celery stalks have been in the colored water for a total of 24 hours, use this chart to record any changes.

4.5. **Day 3 Observation Chart:**

After all three celery stalks have been in the colored water for a total of 48 hours, use this chart to record any changes.