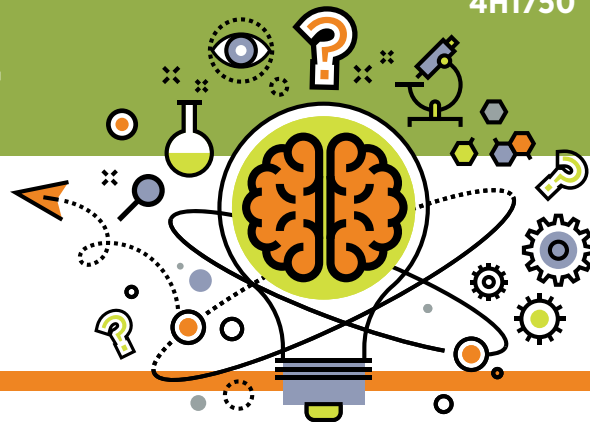


TEACHING SCIENCE

...when you don't know diddly-squat



Do different types of milk taste different?

Purpose:

The purpose is **not** to teach specific content, but to teach the process of science – asking questions and discovering answers. This activity encourages young people to try to figure things out for themselves rather than just read an answer on the internet or in a book. As a leader, try not to express your opinion, but let the youth engage in arguments based on evidence.

Time required:

20 minutes or multiple days depending on the interest and questions the youth have

Materials:

- Different types of milk (Try to get an amount so each member of your group can have a taste without a lot of leftover waste. Choose some from the following: whole milk, 2% milk, 1% milk, skim milk, reconstituted powdered milk, organic milk, lactose-free milk, evaporated milk, goat milk, soy milk, almond milk, coconut milk, rice milk, half and half, heavy cream, shelf-stable milk, hemp milk, hazelnut milk, flax milk, oat milk, cashew milk, pea milk.)
- Lots of cups (disposable or reusable)
- Blindfolds (optional)
- Paper
- Pencils
- Water

Science Practice:

Asking questions and defining problems

1. *Do different types of milk taste different? Do you think you can tell the difference between different types of milk? What things affect milk taste? Is texture the same thing as taste? Do you think certain groups of people might prefer one type of milk or another? Are some people better tasters? Do males like different kinds of milk than females? Do adults like different types of milk than young people?*

Science Practice:

Planning and carrying out investigations

2. Hide or modify each milk container so participants can't see the label. Label each milk with a letter (A, B, C and so on). Make sure you keep track of the type of milk each letter stands for but keep that a secret. Let participants guess what each kind of milk is and have them write it down on a piece of paper. Depending on the age of the participants, they may need help writing. Have them swirl the milk in their mouths. *Do various parts of the tongue taste the milk differently? Do the types of milk smell different? Does the milk feel different on your mouth and tongue? Does the milk have a different appearance in the glass? If you swirl it around, does it leave some of the milk on the side of the glass?* After everyone has had a chance to guess the types of milk, ask participants to vote for the milk they like the best. Each should leave a paper with his or her name on it in front of one choice. NOTE: Be aware of food allergies or sensitivities. You may also want to have a "spit bucket" in case kids really don't like a certain type of milk. Have the children drink some water between each type of milk to clear the taste out of their mouths.

Science Practice:

Analyzing and interpreting data

3. *Were some people better at guessing the milk types than others? Why might some people be more accurate? Do the people who guessed better have tongues that look different? Is there a method to measure tasting ability? Which milk was the favorite?*



▶ DO DIFFERENT TYPES OF MILK TASTE DIFFERENT?



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You do not need all the answers to teach science. You simply need an inquisitive mind and to be willing to carry out an investigation.

Science Practice:

Using mathematics and computational thinking

4. Can you graph the accuracy of the type of milk? Were males or females more accurate in their tasting abilities? Were youth or adults more accurate? Did some groups like one kind of milk better than another?

Science Practice:

Engaging in argument from evidence

5. If you were going to recommend to milk processors to produce more of a certain kind of milk, what would it be and why?

Other thoughts:

- ▶ Do you think you could tell what breed of dairy cow the milk came from by taste?
- ▶ Do you think what a cow eats will affect the taste of the milk?
- ▶ Why do we milk mostly cows in the United States rather than other animals? Are other types of animals used in other parts of the world for milk? How might their milk taste different?
- ▶ Are there any mammals whose milk is never used for human consumption? Why? Would you drink cat milk if it was offered to you?
- ▶ If someone was particularly good at determining milk types by taste, what profession might they be good at?
- ▶ Are any of the milks better for chocolate milk? Why or why not?
- ▶ Are certain kinds of milk healthier than others? Why or why not?
- ▶ Are any types of milk better for the environment? Why or why not?
- ▶ This experiment could be recreated with different kinds of eggs, apple ciders or poultry, different types of water (tap compared to bottled water brands) or vegetables (name-brand compared to generic or store-bought compared to home-grown).

Science & Engineering Practices:

These eight Science and Engineering Practices come from *A Framework for K-12 Science Education* (National Research Council, 2012, p. 42). These research-based best practices for engaging youth in science are connected to in-school science standards that all children must meet.

- ▶ Asking questions and defining problems
- ▶ Developing and using models
- ▶ Planning and carrying out investigations
- ▶ Analyzing and interpreting data
- ▶ Using mathematics and computational thinking
- ▶ Constructing explanations and designing solutions
- ▶ Engaging in argument from evidence
- ▶ Obtaining, evaluating, and communicating information

Reference:

National Research Council. (2012). *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*. Washington, DC: National Academies Press.

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