

COLLECT YOUR OWN DNA!

QUICK PEEK

In this lesson, students will collect and see their own DNA!

SUGGESTED GRADE LEVELS: 4–8

ILLINOIS STATE LEARNING GOALS

SCIENCE

12.A, 13.B

MATH

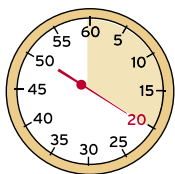
7.A

LANGUAGE ARTS

3.A, 4.A, 4.B

OBJECTIVES

- ★ Students will collect and observe their own DNA.
- ★ Students will understand that DNA can be extracted from any cell in their body.



PACE YOURSELF:
20 MINUTES



PREPARE YOURSELF

1. Before starting, place the container of rubbing alcohol in the freezer and allow it to chill for at least one hour.
2. Make copies of the “How To”.



MATERIALS

Per Classroom:

- Table salt
- Dish soap
- Rubbing alcohol (the 70% solution you find at the drug store will work just fine)
- Tap water

Per Group:

- Teaspoon

Per Student:

- Four small drinking cups



WHAT YOU NEED TO KNOW...

DNA, or deoxyribonucleic acid, is the hereditary material in humans and almost all other organisms. With the exception of red blood cells, every cell in the body has DNA and every cell in a person's body has the same DNA. Most DNA is located in the cell nucleus, but a small amount of DNA can also be found in the mitochondria. In the following activity, students will collect cells from the inside of their cheeks.



WARM UP!

1. Ask students to define DNA. (Answers will vary, refer back to What You Need To Know for answers.)
2. Write important information on the board.
3. Ask students: How is DNA used by investigators? (Possible answers: linking a person to a crime scene or proving people are related.)
4. Tell students that today they will be collecting their own DNA and will actually be able to see it!
5. Distribute materials.

DNA can be used to prove a relationship to an individual. Its use in famous criminal investigations has made it a "household name," so to speak.



In 1857, Father Gregor Mendel discovered that the relationship between parents and offspring followed a code, and he founded the science of heredity. It took scientists another hundred years to more fully understand this code.

THE HOW TO

- 1.** In the first cup, mix a half glass of water (approximately 6 oz.) with 1 tablespoon of table salt. Label the cup 1.
- 2.** In the second cup, mix 3 tablespoons of water and 1 tablespoon of liquid dish soap. Label the cup 2.
- 3.** Take one teaspoon of the salt-water solution from the first cup and swirl it in your mouth for 30 seconds.
- 4.** After 30 seconds, spit the salt water and whatever contents are moving around in your mouth into a third empty cup. Label the cup 3.
- 5.** Collect 1 teaspoon of the spit that is in cup number three, and transfer this to the fourth empty cup. Label the cup 4. Pour any extra spit down the drain.
- 6.** Add 1 teaspoon of the soap solution to the spit in cup number three, and mix by gently swirling the cup for one minute.
- 7.** After mixing, add three tablespoons of rubbing alcohol to the cup of spit and soap. Try to gently pour the alcohol down the side of the glass so that it floats up on top of the spit and soap without mixing.
- 8.** Wait about one minute, and you will see a cloud of bubbles hanging at the bottom of the layer of alcohol. Those bubbles are attached to your DNA!

When you're finished, answer these questions on a separate sheet of paper:

- 1.** What does DNA stand for?
- 2.** Where in your body can DNA be found?



WHAT'S GOING ON HERE?

By adding soap to your cheek cells, it breaks the membranes of the cell open and the contents of the cell, including the DNA, spill out. The salt changes the ionic concentration of the water and makes it easier for the DNA and RNA to separate. DNA will not dissolve in alcohol, so when you add alcohol to the solution the DNA collects where the two layers meet.



DID THEY GET IT?

Have students either share their answers to the questions above with the class, or collect and grade them.



ET CETERA

1. Discuss with students the relationship between genes and family. Have students bring in pictures of their families and compare traits such as height, eye color and hair color.
2. Have students make a Family Tree. You can have them trace their ancestors back to their grandparents or even farther!

If you uncoiled the DNA in a cell, it would be about three meters long.