

DNA ala Kiwi

Teacher's Guide

The Initial View (Introducing the Activity)

Peel the fruit. Slice the kiwi very thin; keep all the slices refrigerated until ready to use. Denatured alcohol is available at hardware stores. Rubbing alcohol can be substituted, but doesn't work as well! You will need a whole kiwi fruit for each three groups of students. An alternative is to do the activity as a demonstration. Have the kids dispose of the material in a single container, then you can dispose of all waste to the trash. *A transparent or clear shampoo works best*, one which works well and is inexpensive is *Suave Daily Clarifying Shampoo*. If needed, use adhesive tape or a rubber band to hold the filter off the bottom of the cup.

Take a Deeper View! (More Science)

The detergent (shampoo) is a **Molecule** which helps break down the **Cell** and **Nuclear Membranes** of the kiwi fruit cells. (So does the "mashing"!) The **DNA** is now free to float around the water. A separation in Chemistry is called an **Extraction**. You're using one chemical to separate another chemical from a **Mixture**. (Your mashed kiwi and the rest of the stuff you added is now a mixture.) The action of the detergent and salt helps the DNA to **Precipitate**, or "clump" together in the test tube. Many chemical procedures use **Precipitation** to separate materials for studying! DNA is a chemical found in almost all living things. DNA carries a "model" or template for the making of a unique and special living thing! Even though all DNA is made of the same substances, the arrangement is the key to its action and uniqueness!

More and Bigger Views! (Additional Classroom Ideas)

1. The **Human Genome Project's** purpose is to produce a "map" or listing of the special arrangement of human DNA. Check out the progress and findings of the HGP.
2. What **Diseases** are carried in a person's DNA? Research **Sickle Cell Anemia** as an example. Use the Internet for learning more about the HGP and genetic diseases. Make a bulletin board of what you learn about DNA, **Cloning**, and altering DNA!
3. Find out what chemicals make up DNA. How are they hooked together? DNA is built like a "ladder" which "unzips" in the middle when it has to do its work!
4. What is **Cloning**? Find out how humans have cloned plants for hundreds of years. Learn more about **Grafting** (cloning) and other methods for cloning plants for food and beauty.
5. Research the controversy and dangers of cloning animals and humans.
6. Learn more about "Dolly" the cloned sheep. What special problems and unexpected results have scientists found about cloning this sheep?
7. Look up James Watson and Francis Crick and their discoveries about DNA.
8. Find out how DNA **Replicates** or duplicates itself! What a miraculous chemical!
9. Find out how DNA **Translates** or "communicates" its information for the rest of the cell in order to control the cell's chemistry and actions. It's definitely the "boss" chemical!!!
10. What are some chemicals, radiation, and illegal drugs which can permanently damage your DNA? What kind of **Birth Defects** and problems does this damage produce?
11. Learn how the different forms of **Cancer** are related to DNA and its action.
12. How have people improved livestock, crops, and ornamental plants without altering DNA? Research **Selective Breeding** and the research involved in improving these plants and animals. What are some benefits and dangers of altering DNA of living things?
13. Learn more about **GMOs**. (Genetically Modified Organisms) What pros and cons can you identify about the use of these living things?