

Introduction to DNA and DNA Fingerprinting

Suggested Age /Grade Level	Concepts/Curriculum Covered	Duration
Students in Grades 7-9 (13-15 years old)	<ul style="list-style-type: none"> • What is DNA and why is it important • DNA structure • DNA Fingerprinting 	Reading time: 20 minutes Video time:12 minutes Activity time: 60 minutes

Overview

DNA is the hereditary material in humans and is an essential molecule for life. The objective of these resources is to introduce what DNA is and why it is a very important molecule, as well as the basic structure of a DNA molecule. Students will then be introduced to DNA fingerprinting and how it's used in ordinary life.

Learning goals

- Understand what is DNA and why it is important for living beings
- Understand the basic structure of DNA and apply the concept of complementary base pairing
- Learn what is DNA fingerprinting and its practical uses
- Apply concepts of what is DNA and DNA fingerprinting in a simulated scenario

Activity Timeline

[Introduction video on what is DNA \(4:21\)](#)

<https://www.youtube.com/watch?v=C1CRrtkWwu0>

This video introduces students to the concept of DNA and its importance to life. It also introduces the basic structure of DNA.

Build your own edible DNA

<http://www.andersononline.org/ourpages/auto/2015/1/21/52509287/Twizzler%20Lab.pdf>

Using the information of the basic structures of DNA learned in the introduction video, to build their own model using candy and some toothpicks.

Materials

- Licorice Candy (other kinds of rope candy can be used as well)
- Colored Marshmallows of 4 different colors (can also use gummy candy)
- Tooth picks

(Alternative to Edible DNA activity) Build Your Own DNA (non- edible):

<https://www.amnh.org/explore/ology/genetics/make-a-dna-model2>

If you don't have edible items to use for the Build Your Own Edible DNA activity mentioned above, this alternate activity uses non-edible items. Concepts about DNA structure learned in the introduction to DNA video are still applied here.

Materials

- Colored paper
- Scissors
- Toothpicks
- Markers
- Ruler
- String
- Masking Tape

DNA fingerprinting (2:07) <https://www.youtube.com/watch?v=AkBUriMK9u8>

Using the concepts of DNA learned in the introduction video, this video introduces DNA fingerprinting. This video explains what DNA fingerprinting is and how it's used in everyday life.

Interactive DNA fingerprinting reading <http://www.dnai.org/d/index.html?m=1>

This interactive article goes through different situations where DNA fingerprinting can be used. Its interactive features include going through real life cases, matching and comparing DNA fingerprints of suspects involved in the case.

Forensic DNA Analysis (6:29):

<https://www.pbslearningmedia.org/resource/tdc02.sci.life.gen.sheppard/forensic-dna-analysis/> *

This video follows a team of experts and forensic scientists who investigate a murder using DNA fingerprinting. This video ties in concepts learned from the above resources. This video also includes a “support materials” section which includes background reading on DNA fingerprinting and questions students can answer after watching the video.

* **Viewer discretion is advised.** The main focus of this video is about DNA fingerprinting and how it's done but it is also focused on a murder case.

Optional Resources

DNA Profiling Gizmo + Worksheet:

<https://www.explorelearning.com/index.cfm?method=cResource.dspView&ResourceID=1092> *

This Gizmo allows students to experience a lab simulation where students are a forensic DNA analyst. They will go through the different lab techniques used in a forensic lab and using the results they obtain, they will solve a case.

* DNA profiling Gizmo + worksheet requires a gizmo account. A free trial can be used to do the gizmo but when that free trial is done, there will be no access to that particular DNA profiling gizmo. However, Gizmo does have a free library with other STEM related simulations that can be done.