



Grade Level: 8

Indiana Academic Standards: Examples of select academic standards possibly met during this activity. Additional academic standards may be achieved with added enrichment activities.

Life Science: 8.3.4,

Time: 45 minutes, plus set-up.

Materials:

Pony beads in the following colors: Purple, Yellow, Green, Pink
Chenille sticks OR bracelet elastic string from a craft store.
Scissors

Recommended Reading:

Illinois Ag in the Classroom Biotechnology Ag Mag
www.aginthclassroom.org

Resources:

GMOanswers.org
<http://www.life.umd.edu/grad/mlfsc/TIP.htm>

Sources:

<https://www.genome.gov/27541804/us-science-and-engineering-festival/>

Illinois Ag in the Classroom

www.aginthclassroom.org

DNA Model Bracelet

Description: Every living thing is composed of cells. Construct a 3-D model of a DNA Helix.

Objectives:

Explain that all living things have their own unique DNA sequence.

Background:

DNA, deoxyribonucleic acid, is the chemical name for the molecule that carries genetic instructions in all living things – from microbes, to plants, to insects, to fish, to human beings. DNA is made up of four types of chemical building blocks called nucleotides. These blocks—adenine, thymine, cytosine and guanine—are abbreviated with the letters A, T, C, and G.



Activity Directions:

1. Choose one DNA sequence code from the chart provided (page 2). You will need this chart to follow the DNA sequence to make your model.
2. Thread a bead onto your first Chenille stick. The on the second chenille stick, thread the matching bead. Use the guide below to help. Example would be if your first bead on the first Chenille stick is pink (T), then on your second chenille stick the bead would be green (A), because T always pairs with A.
3. Finish out both sides of your DNA strand following the pattern.
4. Once all the beads have been placed on their chenille sticks, twist them into the form of a Helix, sometimes referred to as the DNA ladder.
5. Tie the chenille sticks together to form a bracelet to fit your wrist. Compare to other students' models and determine what plant or animal they built.

Base Pair Chart

A = Adenine (green) pairs with T=Thymine
T =Thymine (pink) pairs with A= Adenine
C = Cytosine (yellow) pairs with G = Guanine
G = Guanine (purple) pairs with C= Cytosine

DNA Sequence Chart

Monarch Butterfly (*Danaus Plexippus*)

gaggctaccaagtttccgatctgcaggagatgcattgaaagatcgtttcg

Sunflower (*Helianthus Annuus*)

tgagatgctagaagggtgcaaaatcaatagggcccgagctgctacaattg

Chimpanzee (*Pan Troglodytes*)

tgaccccgacacgcaaaattaaccactaataaaaattaattaactca

Human (*Homo Sapiens*)

tgaccccaatacgcacaaattaaccccctaataaaaattaattaaccgctca

African Elephant (*Loxodonta Africana*)

atcacccgacattcgaaaaatctcatccttcaactcaaaatgatgaataaatc

Apple Tree (*Malus Domestica*)

gaattcggcaccgagaaagaaacgaagagagagagagagcaaaaatggttt

Red Flour Beetle (*Tribolium Castaneum*)

cacaacctcggggatcgccttcgccatcctctgcctggccgagaatccca

Brown Trout (*Salmo Trutta*)

ctttggctcactcttaggcttgtgtctagccacccaaatcttaaccggac

Human Heart

gttgctggtaacaatctcataaaatcgggctccagtgtttagagaaggacag