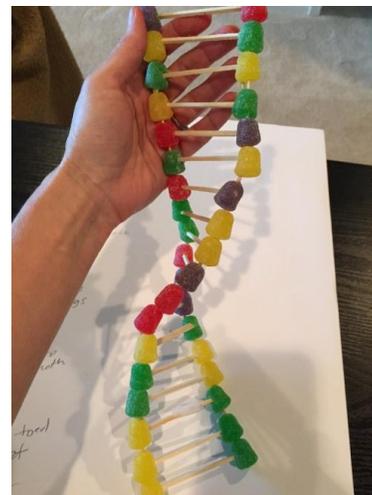
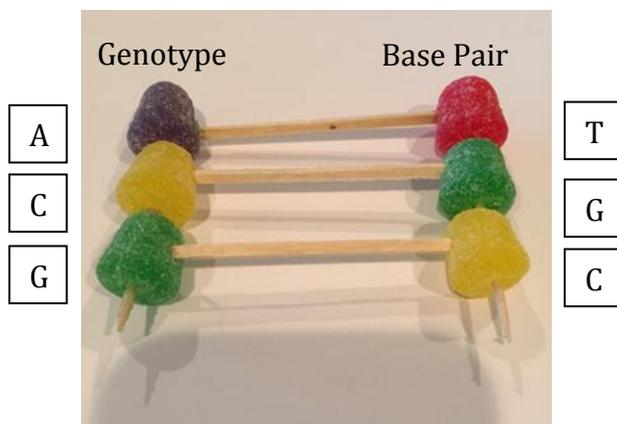




- The third column in the *Dinosaur DNA Code Table* indicates the DNA nucleotide sequence that produces each phenotype. For example, if the DNA sequence for head size is ACG, then the dinosaur will have a large head. Use your dinosaur characteristics card to identify the DNA nucleotide sequence that will produce each of your dinosaur's phenotypes.
- Let's build your dinosaur's DNA! Use the *DNA Color Key* to select which three gumdrops to use for your first trait. For example, if your dinosaur has a large head, the DNA nucleotide sequence is ACG, and your first three gumdrops should be purple-yellow-green. Connect your first three gumdrops by sliding a toothpick through them. These three nucleotides (gumdrops) represent the gene for your dinosaur's head size. A gene is a piece of DNA that codes for a specific trait.
- Use the dinosaur characteristics card and both tables to continue to build your dinosaur's genes out of toothpicks and gumdrops. When finished, use the toothpicks to connect all of your genes into one long strand. This long strand represents one side of your dinosaur's DNA.
- The last step is to build the opposite side of the DNA molecule. DNA is shaped like a double helix; it looks like a twisted ladder. Each nucleotide in DNA forms a bond with only one other type of nucleotide to form a base pair. There are only two possible base pairs:

Adenine (A) – Thymine (T)  
 Guanine (G) – Cytosine (C)

Adenine (purple) will only bond with Thymine (red). Cytosine (yellow) will only bond with Guanine (green). Use this nucleotide base pairing rule to build the other strand of your DNA molecule. Use toothpicks to join each nucleotide pair in the middle of the two strands.



**31 Days of STEM FUN!**

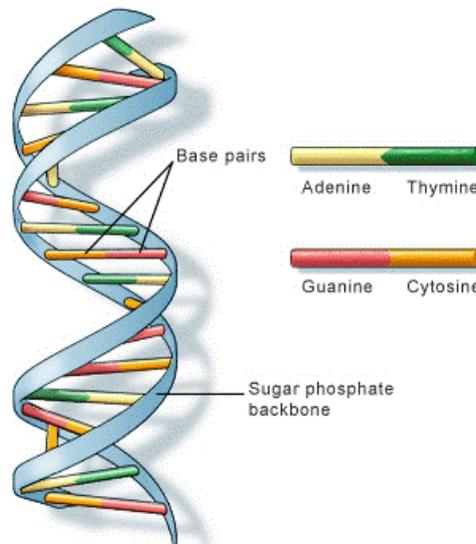
[www.destember.org](http://www.destember.org) | [#deSTEMber](https://twitter.com/deSTEMber) | © 2016 by Girlstart [www.girlstart.org](http://www.girlstart.org)

DeSTEMber is a trademark of Girlstart

## STEM Explanation:

DNA stands for Deoxyribonucleic Acid. In the same way that a blueprint is used as instructions for building a house, DNA is used by cells as instructions for life. DNA contains the instructions for an organism's growth, development, and ability to stay healthy. For example, DNA contains codes to create your physical traits like hair color, height, and whether or not you can roll your tongue. Traits are characteristics that are inherited, which is why we look somewhat like our parents. A molecule of DNA can be very long. A gene is just a piece of DNA that contains the instructions for a specific trait. So, the eye color gene tells you what color eyes you have! The physical characteristic that you have, like the actual color of your eyes, is called a phenotype.

DNA is a double helix. This means that it looks like a spiral staircase. One molecule of DNA is actually made up of many little pieces called nucleotides. The sequence of the nucleotides is what determines our traits. There are four types of nucleotides: *adenine (A)*, *thymine (T)*, *cytosine (C)*, and *guanine (G)*. Each nucleotide has a specific partner that it pairs with in the spiral staircase shape of DNA. For example, A always pairs with T and C always pairs with G. Different combinations of these four nucleotides create the codes for the approximately 20,000 different genes that make you who you are. No one else has the exact same sequence of DNA as you— unless you have an identical twin!



U.S. National Library of Medicine  
<http://www.chemguide.co.uk/organicprops/aminoacids/doublehelix.gif>

## Career Connection:

*Biomedical engineers* study which specific DNA sequences code for certain characteristics as they investigate genetic disorders, such as color blindness, Down syndrome, cystic fibrosis, and hemophilia. Biomedical engineers also work to develop technologies that can identify DNA mutations and manipulate or replace genes that are damaged or missing.

## Resource:

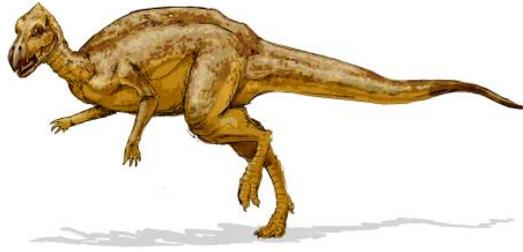
[https://www.teachengineering.org/activities/view/cub\\_biomed\\_lesson09\\_activity2](https://www.teachengineering.org/activities/view/cub_biomed_lesson09_activity2)

**31 Days of STEM FUN!**

[www.destember.org](http://www.destember.org) | #deSTEMber | © 2016 by Girlstart [www.girlstart.org](http://www.girlstart.org)

DeSTEMber is a trademark of Girlstart

## Dino DNA Resource

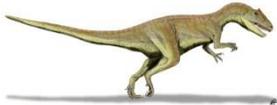
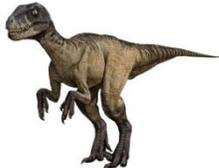
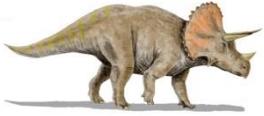


| DNA Color Key      |                        |
|--------------------|------------------------|
| <i>Candy Color</i> | <i>DNA Nucleotides</i> |
| Purple             | A                      |
| Yellow             | C                      |
| Green              | G                      |
| Red                | T                      |

| Dinosaur DNA Code Table |                     |                                |
|-------------------------|---------------------|--------------------------------|
| <i>Trait</i>            | <i>Phenotype</i>    | <i>DNA Nucleotide Sequence</i> |
| Head size               | Large               | ACG                            |
|                         | Wide                | AGC                            |
|                         | Small               | AGT                            |
| Tail length             | Short               | CGT                            |
|                         | Long                | CTG                            |
| Neck length             | Short               | TGG                            |
|                         | Long                | TGC                            |
| Arms and legs           | Two arms, long legs | TAA                            |
|                         | Longer back legs    | TTA                            |
|                         | Shorter back legs   | TAT                            |
| Teeth                   | Sharp               | GCC                            |
|                         | Leaf-shaped         | GTG                            |
|                         | Cheek               | GCT                            |
|                         | Peg                 | GTC                            |
| Feet                    | Three-toed          | GAA                            |
|                         | Four-toed           | GGG                            |
|                         | Five-toed           | GTT                            |

**31 Days of STEM FUN!**

## Dinosaur Characteristics Cards

|                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;"><b>Allosaurus</b></p> <p style="text-align: center;">Large head<br/>Long tail<br/>Short neck<br/>Two arms, long legs<br/>Sharp teeth<br/>Three-toed feet</p>    | <p style="text-align: center;"><b>Ankylosaurus</b></p> <p style="text-align: center;">Wide head<br/>Club tail<br/>Short neck<br/>Longer back legs<br/>Leaf-shaped teeth<br/>Five-toed feet</p>        | <p style="text-align: center;"><b>Brachiosaurus</b></p> <p style="text-align: center;">Small head<br/>Long tail<br/>Long neck<br/>Shorter back legs<br/>Sharp teeth<br/>Five-toed feet</p>          |
| <p style="text-align: center;"><b>Deinonychus</b></p> <p style="text-align: center;">Large head<br/>Long tail<br/>Short neck<br/>Two arms, long legs<br/>Sharp teeth<br/>Four-toed feet</p>  | <p style="text-align: center;"><b>Diplodocus</b></p> <p style="text-align: center;">Small head<br/>Long whip tail<br/>Long neck<br/>Longer back legs<br/>Peg teeth<br/>Five-toed feet</p>           | <p style="text-align: center;"><b>Stegosaurus</b></p> <p style="text-align: center;">Small head<br/>Long spiked tail<br/>Short neck<br/>Longer back legs<br/>Cheek teeth<br/>Three-toed feet</p>  |
| <p style="text-align: center;"><b>Triceratops</b></p> <p style="text-align: center;">Large head<br/>Short tail<br/>Short neck<br/>Longer back legs<br/>Cheek teeth<br/>Five-toed feet</p>    | <p style="text-align: center;"><b>Tyrannosaurus Rex</b></p> <p style="text-align: center;">Large head<br/>Long tail<br/>Short neck<br/>Two arms, long legs<br/>Sharp teeth<br/>Three-toed feet</p>  | <p style="text-align: center;"><b>Velociraptor</b></p> <p style="text-align: center;">Small head<br/>Long tail<br/>Short neck<br/>Two arms, long legs<br/>Sharp teeth<br/>Four-toed feet</p>      |

**31 Days of STEM FUN!**

[www.destember.org](http://www.destember.org) | [#deSTEMber](https://twitter.com/deSTEMber) | © 2016 by Girlstart [www.girlstart.org](http://www.girlstart.org)

DeSTEMber is a trademark of Girlstart