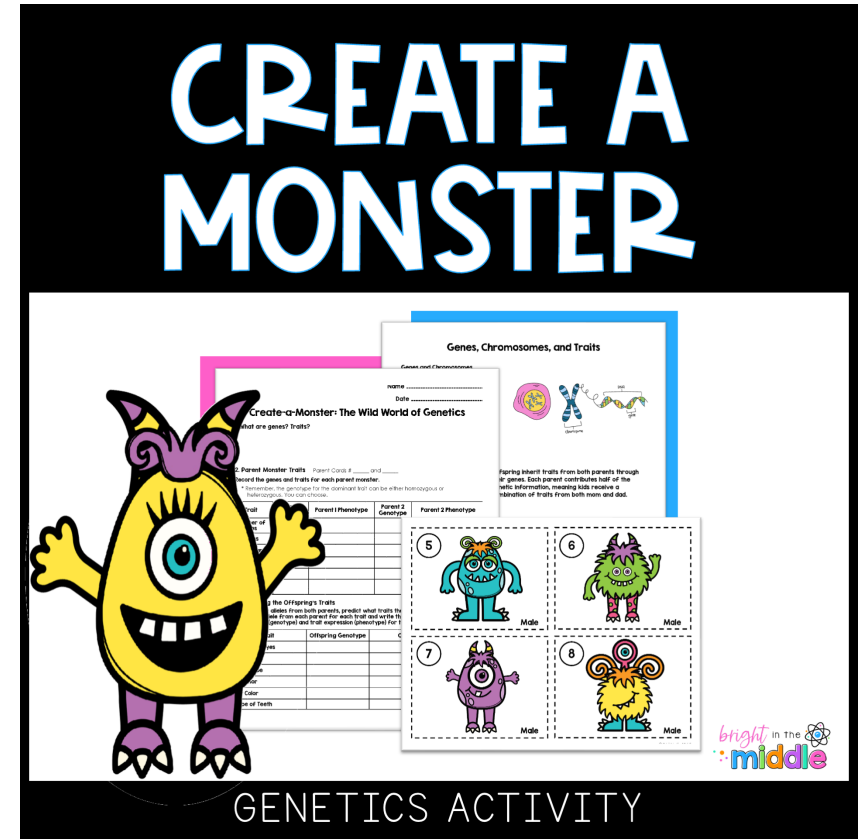


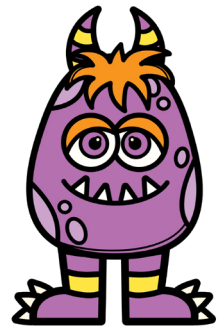
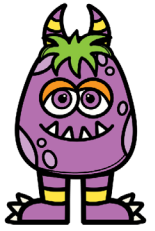
RESOURCE AT A GLANCE:

- ✓ Ready to use
- ✓ Teacher guide
- ✓ Background information
- ✓ Student worksheets
- ✓ Extension activity
- ✓ Answer key



Ready to use in your classroom today!

Detailed teacher instructions and answer keys included.

Teacher's Guide		Monster Traits Activity		Monster Mutations																													
Create-a-Monster: The Wild World of Genetics		Name <u>Example KEY</u> Date _____		Name <u>Example KEY</u> Date _____																													
I. What are genes? Traits? Genes are sections of DNA found on chromosomes that carry instructions for making proteins, which determine traits like eye color or height. Traits are characteristics, like hair color or body shape, that result from the genes inherited from the parents.		I. What are genes? Traits? Genes are sections of DNA found on chromosomes that carry instructions for making proteins, which determine traits like eye color or height. Traits are characteristics, like hair color or body shape, that result from the genes inherited from the parents.		I. What is a mutation? A mutation is a change in the DNA sequence of a gene on a chromosome. This change can affect how proteins are made in the body. Mutations can happen naturally or be caused by things in the environment, and they can have positive, negative, or neutral effects on an organism's traits.																													
Students will: - create a fictional monster based on two parent monsters and explain how genes influence these traits. "construct an explanation supported with scientific evidence to summarize the role of genes on chromosomes as inherited cellular structures which contribute to an organism's traits".		Monster Traits Parent Cards # <u>3</u> and <u>5</u> Genes and traits for each parent monster: The genotype for the dominant trait can be either homozygous or heterozygous. You can choose.		offspring's mutation (on the mutation card)? A mutation causes the baby monster's hair to be bright green.																													
This resource includes: - teacher's guide - student background information 8 Monster Parent Cards (male and female) - Monster Traits Key - Student Recording Sheet - Mutation Scenario Cards and Student Recording Sheet (extension)		<table border="1"><thead><tr><th>Parent 1 Genotype</th><th>Parent 1 Phenotype</th><th>Parent 2 Genotype</th><th>Parent 2 Phenotype</th></tr></thead><tbody><tr><td>ee</td><td>two eyes</td><td>ee</td><td>two eyes</td></tr><tr><td>Hh</td><td>swirls</td><td>Hh</td><td>swirls</td></tr><tr><td>bb</td><td>fuzzy-shaped</td><td>BB</td><td>egg-shaped</td></tr><tr><td>CC</td><td>purple</td><td>cc</td><td>blue</td></tr><tr><td>Aa</td><td>orange</td><td>AA</td><td>orange</td></tr><tr><td>tt</td><td>rectangular</td><td>Tt</td><td>triangular</td></tr></tbody></table> The Offspring's Traits From each parent, predict what traits the offspring will inherit. Write the genotype for each trait and write the resulting gene expression (phenotype) for the offspring.		Parent 1 Genotype	Parent 1 Phenotype	Parent 2 Genotype	Parent 2 Phenotype	ee	two eyes	ee	two eyes	Hh	swirls	Hh	swirls	bb	fuzzy-shaped	BB	egg-shaped	CC	purple	cc	blue	Aa	orange	AA	orange	tt	rectangular	Tt	triangular		
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Directions: - You can give students the background information if needed. - Divide students into groups. Each group will predict the traits of a baby monster using the Monster Parent Cards. - Give each group two Monster Parent Cards (1 male and 1 female), the Monster Traits Key, and a Student Recording Sheet. - Each group will predict the traits of the monsters' offspring and follow the directions on the Student Recording Sheet. Students will answer questions about the genotype and phenotype of the parents and offspring, draw their offspring, and summarize how genes influence their traits. (Punnett squares will not be covered). - There is an extension included if time allows. Each group can be given a Mutation Scenario Card and Mutations Student Sheet. The mutation cards introduce random changes to specific traits. Students will determine whether these changes are harmful, helpful, or neutral. Then, they will draw their offspring again and answer questions about the offspring's mutation.		<table border="1"><thead><tr><th>Offspring Genotype</th><th>Offspring Phenotype</th></tr></thead><tbody><tr><td>ee</td><td>two eyes</td></tr><tr><td>hh</td><td>pointed</td></tr><tr><td>Bb</td><td>egg-shaped</td></tr><tr><td>Cc</td><td>purple</td></tr><tr><td>AA</td><td>orange</td></tr><tr><td>Tt</td><td>triangular</td></tr></tbody></table> Summarize how genes code for traits in the offspring. Genes code for traits in offspring by providing the instructions for producing proteins, showing how recessive traits can create differences in appearance.		Offspring Genotype	Offspring Phenotype	ee	two eyes	hh	pointed	Bb	egg-shaped	Cc	purple	AA	orange	Tt	triangular																
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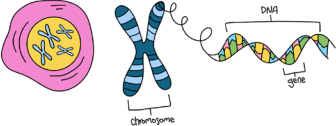
Make reviewing genetics hands-on and fun!

Student worksheets, cards, and extra resources included.

Genes, Chromosomes, and Traits

Genes and Chromosomes

- Genes are segments of DNA that contain the instructions for our traits, like height, hair color, and eye color.
- These genes are found on chromosomes, which are inherited structures located in the nucleus of nearly all cells.



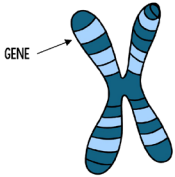
Inheritance of Traits



- Offspring inherit traits from both parents through their genes. Each parent contributes half of the genetic information, meaning kids receive a combination of traits from both mom and dad.

How Genes Influence Traits

- Genes code for proteins that affect how we look and function. These physical traits are called phenotypes (e.g., hair color, height, etc.).
- The specific genetic makeup, or combination of alleles (versions of a gene), is called the genotype. The genotype influences the phenotype.
- While many traits are determined by genes (genotype), some can also be influenced by environmental factors. However, genetic traits are passed down from parents.

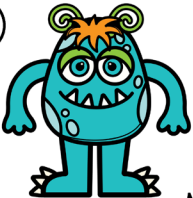


Even though this monster activity is fictional, it's similar to how genetics work in real life. Genes determine traits like eye color, and just like with our monsters,

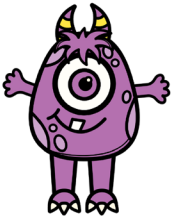
Monster Traits Key

Trait	Dominant	Recessive
One Eye (E)		Two Eyes (e)

Extension: Mutation Cards

5

6

7

A random genetic mutation causes the monster to produce a special protein that makes its hair glow in the dark.	A rare mutation causes an extra eye to form.
An unexpected mutation causes the offspring to be born without horns.	A random genetic mutation causes the eye color to become rainbow-like.
A genetic mutation leads to extremely long, saber-like teeth.	A mutation causes the baby monster's body to become unusually long and snake-like.
An unexpected mutation causes the baby monster's hair to be bright green.	A rare mutation causes the monster's body to be shorter and wider.

Monster Mutations

I. What is a mutation?

Name _____
Date _____

II. What is a mutation card?

Name _____
Date _____

III. What is a mutation card?

Name _____
Date _____

IV. What is a mutation card?

Name _____
Date _____

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