Science: Genius Genetics

OVERVIEW

Students will enter a virtual science lab and learn about Gregor Mendel, cell division, genetic testing, and how life adapts to its environment.

BEFORE YOU PUT ON THE HEADSET:

What is genetics? Let's start with what a gene is:
https://kidshealth.org/en/kids/what-is-gene.html

Everything about your genetics is carried in chromosomes inside your cells. Let's start with what chromosomes are.
https://kids.kiddle.co/Chromosome

DNA carries the information that cells need to work properly.
https://kids.britannica.com/kids/article/DNA/390730

This fun video gives background information on DNA:
https://www.youtube.com/watch?v=6368Y-OfU9U

Bill Nye explains genes:
https://www.youtube.com/watch?v=H2Vw6HgMmTs

Before entering the headset, make sure you read the Post-VR questions so you can search for the answers as you explore.

NOW, LET'S DIVE INTO VR!

1. Open the app 'Genius Genetics'
2. You will be taken to a research vessel containing a few different experiences. Press the trackpad in to teleport around the area.
3. Select an experience with the trigger. You can use the back button anytime to return to the home area.
4. You can do the experiences in any order; remember to take breaks to rest and answer questions!

Post-VR QUESTIONS

MENDELIAN GENETICS

What plant did Gregor Mendel experiment with?

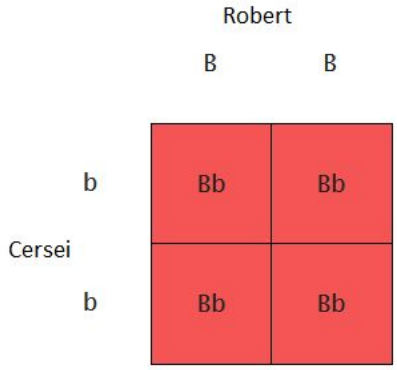
What is an allele?

What does it mean for a trait to be dominant or recessive?

When thinking about Mendelian traits, one very useful tool is the Punnett square: https://en.wikipedia.org/wiki/Punnett_square
Check out the Punnett square below, where B is brown hair and the dominant trait while b is blonde hair and the recessive trait. What is the chance that Robert and Cersei's child is blonde?

Cross:

$BB \times bb$



What would you change about Robert's side of the grid to give their child a 100% chance of being blonde?

CELL DIVISION

How many cells are there in the average human body?

What is an organelle? Which organelle is concerned with cell division?

How many genes are copied each time a cell divides?

What are the four main phases of mitosis, in order? Draw each of them!

GENETIC TESTING

What is DNA? What does it do?

What are ATCG? Where are they found?

What is a karyotype? What can you find by looking at it?

What can you learn from a full genetic test?

Can your genotype be used to make a medical diagnosis?

VIRTUAL FIELD TRIP

What does variation and inheritance allow a population to do?

Where did white grapes come from?

What are some other traits in the food you eat that you think might be the result of genetic modification by humans?

HERE ARE SOME WAYS TO EXPAND YOUR LEARNING:
Explore the Tree of Life here: https://www.onezoom.org/life

That is the Tree of Life, a diagram showing the evolutionary relationships between all life on Earth. Can you find humans, plants, animals, and even bacteria? Combines what you learned in this VR experience with the Tree of Life diagram to think about how long evolutionary changes have driven changes in life forms on earth.

Learn more about the important Punnett Squares concept:
https://scienceprimer.com/punnett-square-calculator

The movie Jurassic Park is based on genetics, as the film highlights here:
https://www.youtube.com/watch?v=h58lRIVHhGc

CRISPER is changing how we understand and manipulate molecules and cells today. Learn more about this amazing technology with this app:
https://apps.apple.com/us/app/crispr-3d/id1468426395