Genetics:
Classroom Lesson Plan

Lesson Topic:

Genetics

Lesson Objective:

Students will be able to define genetics and complete research to discover answers to their genetic questions.

Materials:

- Chart paper, divided into three columns
- Writing utensil
- Copies of "Vocabulary Word List", one per student
- Tablets, laptops, grade-level appropriate books on genetics, or other sources of information for research
- Projector or other method to watch the movie

Advanced Preparation:

- Preview the video before sharing it with your students [4:03].
- Divide chart paper into three equal columns, and title it "Genetics".
- Make copies of "Vocabulary Word List", enough for one per student.
- Prepare tablets, laptops, or source grade-level appropriate books on genetics for research portion of lesson.

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Warm-up Activity:

1. Tell students that they will be watching a video about genetics.
2. Allow students to turn and talk to a partner about what they already know about genetics.
3. Title the first column of the paper "What We Think We Know". Ask students to share their knowledge from their partner discussion with the class. Make notes in the first column of the chart paper.
4. Introduce the Vocabulary Word List from the video. Have students circle the terms they are familiar with and look up the definitions of those they are not familiar with. Direct students to record their own definitions for the words they are familiar with and the dictionary definitions for those they are not.
5. For each term, have students work together to generate sentences or draw pictures that demonstrate their understanding of the vocabulary word in context (e.g., "My body is made up of many different kinds of *cells* such as liver cells, heart cells, and muscle cells." For students that choose to draw pictures, the word *cells* may be represented by a drawing of a general cell or a more specific cell such as a skin cell.)
6. Use this opportunity to clear up any misconceptions regarding word meanings as they relate to genetics.

View the Video: "Genetics"

7. Tell students they will be watching the video titled, "Genetics".
8. Explain that the video presents role models describing genetics and the role it plays in health and medicine.
9. View the video together and have students listen for the role models to use the vocabulary words they just reviewed.

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10. View the video again; this time, invite students to formulate questions or comments about the ideas discussed in the video. Students should be prepared to discuss these after viewing the video.

Video Follow-up:

1. Ask students to offer their questions, comments, reactions, and responses to the video.
2. Review students' ideas about genetics from the warm-up activity.
3. Title the middle column of the chart paper "What We Learned".
4. Ask students to share things about genetics they learned from the video. Note these ideas in the middle column of the chart paper.
5. Point out all the things that students learned about genetics from the video by noting the number of things written in the second column of the chart paper.
6. Ask, "What things are you still wondering about genetics?"
7. Direct students to turn and talk to a partner about questions they still have about genetics or things they still want to learn.
8. As the conversation begins to die down, bring the class back together. Title the final column of the chart paper "Things We Want to Know".
9. Ask students to share their ideas and questions from their partner discussion with the class. Make notes in the third column of the chart paper.
10. Divide students into groups of 3-4. Tell students that they will be working together to find the answer to one of the items in the "Things We Want to Know" column.
11. Have each group select one item from the "Things We Want to Know" column. Distribute laptops, tablets, or genetics books.

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12. Allow time for students to research and discover additional information about genetics.

13. Bring the class back together and allow each group to share the answer they discovered. If desired, students can also make updates to the "What We Learned" column with new information from the group research time.

14. End by reminding students of some of the fascinating information they learned during the class from the video, discussion, or research. Explain that there are many interesting careers in the field of genetics and encourage students who are interested to learn more about these careers on their own time.

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Extension Activities:

1. Direct students to navigate to https://www.unlockinglifescode.org. Students should use the interactive timeline to explore the history of genetics. After free exploration, students can be asked to create their own timeline of genetics or select one point on the timeline to research further and present.
2. Work with students to generate a list of genetics-related careers. Have each student select one or more careers to research. Students should find information on educational requirements, salary, job tasks, and potential career paths.
3. Use the "Related Questions to Explore" as discussion springboards or writing prompts to help students further explore the importance of genetics.

Related Questions to Explore:

- What is the difference between genetics and genomics?
- One way that genes are expressed is through traits such as hair color. What traits do you have? How are these traits the same or different from traits that other members of your family have?
- Why do unrelated people have traits that are the same? For example, maybe you and your neighbor both have the same color eyes.
- Is everything that makes you "you" based on your genetics? Explain your answer.

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Vocabulary Word List from "Genetics" Video:

Cell

Chromosome

DNA

Gene

Genetics

Genome

Genomics

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Ideas for Future Lessons/Activities Related to Genetics:

1. Genetics Career Paths: What Are My Options and How Do I Get There?

2. Literature-Based Learning: Focus on Female Geneticists

3. Genetics Across Time: Explore the Important Discoveries and People Behind Modern Genetics

4. Exploring Twins—Identical Versus Fraternal

5. Ethical Dilemmas in Genetics: Cloning, Medical Privacy, and More!

6. Disease Deep-Dive: Rare Inherited Diseases and Their Causes

7. Foul Humors, Devils, and Curses: A Look at How Our Understanding of Diseases Has Evolved

8. Math Connection: Graphing the Inherited Traits in Our Classroom

9. Gregory Mendel, Peas, and Heredity: The Beginning of a New Science

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