

Sharon Amonett - Engaged Learning Project

Title of Project: What Makes You, You?

Subject: Life Science

Grade Level: 7th

Abstract:

During the unit on genetics and heredity, the students will participate in the online project “The Human Genetics Project” which was created by a high school in New Jersey. The students will collect data on themselves and classmates about which phenotype they have for certain genes. The data will be collected and students will then get to see which traits are dominant and which are recessive based on information collected from all over the country. Students will take on the role of researcher and analyzer to sift through the data and create a video presentation on the differences between dominant and recessive traits as the focus that can be used to teach fifth grade students when they participate in “Lab Cats.” As part of the research process, students will also be given the opportunity to participate in a videoconference with a geneticist from Erlanger Children’s Hospital to ask questions and learn from an expert in the field.

Learner Description/Context:

Dalton Middle School is the only middle school in the Dalton Public Schools system. In the seventh grade we have approximately 700 students spread over five teams of teachers. The student population has a variety of socioeconomic levels with the majority being low socioeconomic level as our school is considered a Title I school. Out of the 130 students on my team, 77% are Hispanic, 15% are White, and 8 % are African-American.

Technology is available to the students on my team through a 1:1 initiative that has provided a laptop computer for each student that is assigned to them and is available to take home for a small rental fee. Students in our school are familiarized with basic productivity tools such as word, excel, and movie editing software through four different technology connection classes that all students take throughout their time at the school. The students also participate in a journalism class and a digital media class where they learn to use a camera and editing software to create video presentations.

Each year our fifth grade students participate in “Lab Cats” where they spend the entire school day going to different stations to learn and investigate science. Each of my students has been through this fun-filled science day and still talk about all the things they learned there since the amount of time given to science in the elementary classroom is minimal.

Time Frame:

The students will work on this project over a three-week time period. They will have one hour a day for the first week to work on this and then the equivalent of three hours a week for the second two weeks. Students in technology connections classes will also have additional support and time during those classes.

Standards Assessed:

Science Georgia Performance Standards:

S7CS1. Students will explore of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

S7CS7. Students will question scientific claims and arguments effectively.

S7L3. Students will recognize how biological traits are passed on to successive generations.

ELA Common Core Performance Standards:

ELACC7W7: Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

ELACC7W8: Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

ISTE NETS-S Standards:

ISTE NETS-S 1. Creativity and innovation.

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

- a. Apply existing knowledge to generate new ideas, products, or processes
- b. Create original works as a means of personal or group expression

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ISTE NETS-S 2. Communication and collaboration.

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

- a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
- b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
- c. Develop cultural understanding and global awareness by engaging with learners of other cultures
- d. Contribute to project teams to produce original works or solve problems

ISTE NETS-S 3. Research and information fluency.

Students apply digital tools to gather, evaluate, and use information.

- a. Plan strategies to guide inquiry
- b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
- c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
- d. Process data and report results

ISTE NETS-S 5. Digital citizenship.

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

Learner Objectives:

Students will be able to understand and clearly communicate the concepts of genetic traits and how they are passed from one generation to another.

Students will be able to understand and clearly communicate the concepts of dominant and recessive traits and the use of a Punnett Square to demonstrate the probability for the next generation.

The “hook” or Introduction:

Students will watch the video *Nova: Cracking Your Genetic Code* that discusses how scientists are able to look at an individual’s genetic code to reveal many things about their health. After the video we will have a discussion about the things they learned from this video as well as answer any questions they might have. Students are always curious to learn more about themselves and why they look the way they do.

Process:

Week 1:

Students will watch the video *Cracking Your Genetic Code* to peak their interest on genetics and how it can affect people in real life. After a discussion about the video, students will be divided into groups of three or four for their project. Students will complete the survey and questionnaire from the Human Genetics Project online. As a group they will reflect on the data to decide which traits are dominant and which were recessive. The group will then complete a research portion of the assignment where they verify their thoughts about dominant and recessive and explore two genetic traits of their choice from the list provided by the teacher. During this time the teacher will have a video conference using Google Hangouts available for the students where they will ask questions of the geneticist from Erlanger Hospital. They will be responsible for a written essay that proves their learning from the research following a rubric created by the teacher and posted on Canvas, the learning management system used in the classroom. On each Friday, the students will reflect on their progress by responding to a discussion board where they share what they have learned and what they have completed up to that point. The students will have the option to keep their post public for others to see or private so only the teacher and student can view the progress.

Week 2:

During the second week students will create a story board for their video to be shown to the fifth grade students. The teacher must approve the storyboard before students begin filming to ensure that all content is included. Video cameras and iPads will be available for students to use when filming their video segments.

Week 3:

Students will wrap up all filming early in the week and spend the last several days editing their videos to create the final project. Assistance from the video production teacher will be available throughout the week if students need guidance or assistance. The following Monday students will present their videos to the class and explain what they learned and why they choose to create their video the way they did. Students will create a rubric and use it to grade each other as they watch and provide feedback to their peers. At the end, the groups with the highest overall scores will be chosen to show to the fifth

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grade students in the upcoming “Lab Cats” science day at the high school. All videos will be posted to the school YouTube channel and shared with the other seventh grade science classes. Students will also be responsible for completing a personal reflection at the end of the project where they take into account their reflections from the end of each week as well as the project overall.

Product:

The end product will be a video explaining dominant and recessive traits that will then be used in our fifth grade “Lab Cats” program where older students work with fifth graders to deepen their understanding of the science curriculum. The videos will be graded by a rubric and must include a clear definition of dominant and recessive as well as visual examples of each.

Technology Use:

In order for this project to be successful students will use the internet to participate in the online project, The Human Genetics Project. This will aid the students in collecting data from all over the country on what basic traits are dominant and recessive. The students will use laptops with word processing to write their essays and turn them in using Canvas, the learning management system. Email and Google Hangouts will be used for two-way conferencing with experts in genetics from Erlanger Hospital to answer questions. Video cameras and iPads will be available for students to film while iMovie software will be used to edit the final projects. Projects will be uploaded to the school channel on YouTube for easy sharing with others.

References and Supporting Material:

The students will have access to the following online resources as well as their textbooks during this project:

- The Human Genetics Project (<http://www.ciese.org/curriculum/genproj/>)
- *Nova: Cracking Your Genetic Code* video (<http://video.pbs.org/video/2215641935/>)
- Canvas (dps.instructure.com)
- Punnett Square Information (http://www.education.com/science-fair/article/biology_it-takes/)
- Dominant and Recessive Examples (<http://learn.genetics.utah.edu/content/inheritance/patterns/>)
- Dalton Middle School YouTube Channel (www.youtube.com)