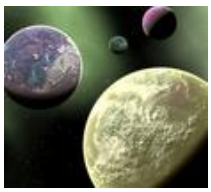
Titan Aliens: Earthly Cells to Alien Cells

Deeper Learning Postcard



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Highlights

Vetted Project: This project challenged Mrs. Ballinger's 7th grade science students to grapple with the question of are we alone in the universe. Students had to decide that if we are not alone in the universe, what would life have to be like to exist on another celestial body like Saturn's moon Titan, specifically on the cellular level. Before students could decide what life would have to be like elsewhere in our universe, they had to fully understand what makes life work here on Earth. This made their mastery of the 7th grade science content of understanding the makeup of both plant and animal cells and their organelles their stepping stones for this project rather than the ultimate goal. After mastering their understanding of plant and animal cells here on Earth, students had to study the conditions on Saturn's moon Titan to determine how that specific harsh environment would impact a potential life form there, especially the makeup of its cells and organelles.

Sustainability: Students created interactive websites about plant and animal cells with tag links to videos the students created to describe each of the plant and animal cells' organelles. These websites about the plant and animal cells will be shared with other grade levels as they learn about plant and animal cells and organelles. The websites will also be used with future 7th grade science students as a resource in their study of plant and animal cells and organelles.

Driving Question: Are we alone in the universe? What would life have to be like to exist on another celestial body specifically Saturn's moon Titan?

Student Reflection: The students' reflections in general showed that they enjoyed the collaboration with their teammates to create their videos about the plant and animal cells' organelles and the creation of their Titan alien and its cell. "My favorite/most enjoyable part of the project was rehearsing and recording our videos/skits and getting out of my comfort zone," said H.J. They also stated that they enjoyed the process of creating their Titan alien with its cells and organelles. "The most enjoyable part of the project was to make up my own creature with few restrictions," said D.H. Many students also reflected that they enjoyed our visit to NASA's Visitor Center, the Virginia Air & Space Center, for our project's launch. Many students also reflected that the most important thing they learned on this project was that the environment of Titan could support life. "I think the most important thing I learned is that the environment of Saturn's moon Titan might be able to have life there," said ME.J. Students frequently noted during their self-reflection that they wished they had made better quality videos during their first recordings. Through their reflections students were able to see where they could have used their time more effectively during the recording days. It seems that this awareness will help them to take their allotted time more seriously as they create future projects. Students reflected that their least favorite parts of the project were doing the research about Titan and not having enough time when creating their videos and animations for their Thinglink websites.

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Teacher Reflection: The most impactful elements of the projects were the creativity and perseverance demonstrated by the students as they created both their Earthly plant and animal cell Thinglink websites and their Titan aliens and their cells Thinglink websites. The students showed deep creativity as they collaborated together, wrote scripts and acted out skits to demonstrate the plant and animal cells' organelles' functions. They had to be respectful of each other's visions for the videos and to compromise on each other's specific ideas to create one definitive video for each plant or animal cell's organelles. Students took their creativity to an even higher level as they had to create a potential Titan alien that had to be based on the scientific data from NASA about Saturn's moon Titan. Each member of the 2 person teams created his or her own scientific-based Titan alien and then the team members had to collaborate to agree upon one Titan alien. One of the most impressive days of the project was when the teams were drafting their one Titan alien creature together. We witnessed respectful collaboration discussions all around the library as students negotiated with each other to promote and defend the features of their Titan alien that they felt were most viable and necessary to be kept in their ultimate Titan alien design. There were some teams who struggled to agree upon one design for their Titan aliens, but they all persevered to combine the best of each other's ideas into one Titan alien with its cell and organelles.

On a scale of 1 to 5, this project is a 5, I would Definitely Recommend it.

Lessons Learned: Time/schedule planning: Our school schedule has 90 minute blocks for each class time. Teachers of science and history have the choice of having their science and history classes meet for 90 minute blocks alternating history on A days and then science on B days or they can split that 90 minute block into two 45 minute blocks to have both science and history meet each day. The 7th grade science and history teachers opt to meet for 45 minutes each day. Only having 45 minutes to work on our project was not as effective as being able to work for 90 minutes. When creating videos and websites as a project, it takes too much time to set up and get ready to truly create media to have to stop so quickly for a 45 minute daily stop time. In the future, it will be a priority to arrange to use the full 90 minute block time whenever products of videos and websites are being created.

I. Authenticity

Performing
Dramatic Performance
Participate in a Rehearsal
Realistic Role
Speech or Spoken Word Performance
Demonstrating
Event
Exhibit / Contest
Film / Documentary
Show / Program
Producing / Revising
Execute Multiple Drafts
Model or Prototype
Product
Presenting
Utilize Visuals

II. Media Produced

Students produced two websites. The first website was an interactive website of a plant or animal cell cross section in which each organelle had a tag that linked to student-created videos in which they acted out skits to demonstrate the functions of each organelle. The second website was their Titan alien and its cell with organelles designed to exist on Saturn's moon Titan. The Titan alien was linked to an animated video that the students created to describe the Titan alien's

characteristics and how they were designed to exist on Titan. The Titan alien's cell also had interactive tags for each of its organelles that linked to animated videos in which each organelle explained its function in relation to the conditions on Titan.

Internet Media
Website
Digital Content
Audio Content
Video Content
Digital Arts / Graphics
Digital Photography
Print Media
Signage
Artistic Composition
Script for Film, Documentary or Play
Technical Writing
Article / Script / Essay (Non-fiction)
Physical Drawings & Fine Arts
Animation
Product Drawing or Sketch

III. Challenging Problems

A challenging problem that this project addressed was to investigate how the environment affects evolution. Students investigated Earthly cells' functions with an understanding of Earth's environment and then studied the conditions on Saturn's moon Titan to create cells with organelles and their functions that related specifically to the conditions on Titan's moon.
Questions
Compassion for the Unknown
Express the Intangible Visually
Themes
Research-based
Topics: Physical World
Evolution
Exploring Earth & Space
Topics: Of the Mind
Imaginary Beings & Worlds

IV. Achieved Literacy Skills

Information / Technology
Avoid Information Misuse
Master Uses of Technology
Media
Utilize Media Creation Tools
Project / Work
Adapt to Ambiguity / Changing Priorities
Address Setbacks / Criticism
Adjust to Schedules / Contexts
Balance Various Roles / Responsibilities
Learn / Develop Expertise
Manage Time / Workload
Take Initiative for Personal Success
Leadership
Balance Diverse Views
Influence through Leadership not Authority
Lead with Respect
Leverage Strengths of Others

Present a Professional Appearance

I. Parameters & Feasibility

Project Timeframe
3-4 Weeks
Assessment Timeframe
More than a Class Period
# of Project Members
Pair
Grade Level
Middle School (Grades 6-8)
Authentic Audience / Evaluators
Peers
Parents
Teachers & Administrators
Community Members
Industry Representatives

II. Intended Learning Outcomes

Creativity
Brainstorm
Design / Create
Elaborate / Expand
Envision / Invent
Improve / Refine
Recognize Limits
Communication
Engage Creatively
Role-play
Technical Presentation
Collaboration
Assume Shared Responsibility
Develop Trust
Encourage Others
Exercise Flexibility
Ignore Distractions
Incorporate Feedback
Manage People / Team
Respond to Failure
Value Contributions Made by Others
Work with Diverse Teams
Critical Thinking
Assemble Parts of a Whole
Balance / Weigh Alternatives
Clarify Meaning
Critique Reasoning of Others
Draw Analytic Conclusions
Negotiate
Overcome Obstacles
Persuade
Rational, Objective Decision-making
Reflect Critically on Learning
Solve Problems Innovatively
Instilled Citizenship Values
Express Empathy / Compassion
Habits of Mind & Heart
Strong Personal / Work Ethic

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III. Success Skills & Depth of Knowledge

Cognitive Demand
Identifying / Remembering
Comprehending / Understanding
Applying
Analyzing
Evaluating Creating
Social & Emotional Skills
Self-awareness
Self-management
Group-awareness
Group-management
Learning Styles / Intelligences
Bodily / Kinesthetic
Interpersonal / Social
Verbal / Linguistic
Visual / Spatial
Assessment Structures / Resources
Checklists
Graphic Organizers Rubrics

IV. CTEs & Disciplines

Career & Technical
STEM Research & Applications
Information Technology
Web & Digital
Communications
Multimedia
Sciences
Astronomy
Biology

