Turning STEM into STEAM – How to Integrate the Arts into Traditional STEM Activities

Topic Information

This topic will begin with a discussion of what STEM is and how it should be included in every classroom, with an explanation of why STEM should not be restricted to science and math classrooms. It will be followed by a typical STEM activity for participants to participate in, example: NASA Resource, Rubber Band Helicopter Engineering Challenge (National Aeronautics and Space Administration, 2020). Upon completion participants will be given an artistic extension including watching a video of the Perseverance Rover working along with Ingenuity on Mars and then they will be asked to create their own drawing of a Rover interpretation working alongside another companion vehicle they create using their imagination. This exercise will show them how creativity can bring excitement and wonder into a typical engineering exercise by adding a creative, artistic aspect. Participants will then be asked to try to think of other ways they might add other artistic aspects to the exercise which would create similar excitement.

Once this project is completed, additional resources will be shared which are relevant to other disciplines such as reading the children's version of Hidden Figures in language arts class and then completing NASA Resource, Make a Paper Katherine Johnson Doll which is an artistic resource itself (National Aeronautics and Space Administration, 2020) and learning about African-American astronauts in social studies class and then using NASA Resource, Printable Puzzles About African American Astronauts which is also an expression of art (National Aeronautics and Space Administration, 2020). They will be reminded that there are many ways to add creative resources to STEM projects which help to further the hands-on experience students enjoy which also help to create a much more meaningful classroom project.

Once these examples have been shared, discuss how additional artistic aspects might be added to each lesson.

School Information

Carson Montessori School is a public charter school in Northern Nevada. This school has been designated as a "developing" STEM school by the Governor's STEM Advisory Council. The school operates with a hands-on approach to real-world learning, presenting students with problem-based projects in order to allow depth of thought and real-world applications of ideas.

Participants

This training should include all educators and staff members as artistic expression can be utilized everywhere, even when experiencing playground conflict or office interaction with students.

Standards

To be addressed

Data Gathering Methods

Pre-presentation survey

What experience have you had with STEM lessons/projects?

What do you believe STEM means in a general education classroom?

Do you believe you teach STEM in your classroom currently?

Are the arts included in STEM lessons/projects?

Are students excited about participating in STEM lessons/projects?

Mid-presentation survey

Have your feelings about your experience with STEM lessons/projects changed at all since the beginning of this presentation? How?

Have your feelings about what STEM means in a general education classroom changed at all since the beginning of this presentation? How?

Have your feelings about whether or not you teach STEM in your classroom currently changed since the beginning of this presentation? How?

Have your feelings about whether or not the arts are or can be included in STEM lessons/projects changed since the beginning of this presentation? How?

Have your feelings about whether or not students are excited about participating in STEM lessons/projects changed since the beginning of this presentation? How?

Post-presentation survey

Now that this presentation has concluded and you've learned what STEM is and how it can be incorporated in any classroom environment:

Do you feel that you now have experience with STEM lessons/projects which makes you feel comfortable incorporating this practice in your classroom?

Do you feel that you have already been using STEM techniques and practices more often than you had realized in your classroom?

Are you comfortable including the arts in STEM lessons as an appropriate and fun way of extending our students' learning experiences?

References

National Aeronautics and Space Administration. (2020). *Classroom Combo: Flying With Ingenuity*. Retrieved from NASA STEM Engagement: https://www.nasa.gov/stem-ed-resources/flying-with-ingenuity.html

National Aeronautics and Space Administration. (2020). *Make a Katherine Johnson Paper Doll*. Retrieved from NASA STEM Engagement: https://www.nasa.gov/stem-ed-resrouces/make-a-katherine-johnson-paper-doll.html

National Aeronautics and Space Administration. (2020). *Printable Puzzles About African American Astronauts*. Retrieved from NASA STEM Engagement: https://www.nasa.gov/stem-ed-resources/printable-puzzles-about-african-american-astronauts.html