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Arts in STEM
Art Integration Paper
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Painting is the practice of applying paint, pigment, and color to a surface, such as a canvas, a mural wall, or paper. The medium of painting often uses a brush, but knives, sponges, and airbrushes can also be useful tools. Painting contributes to the visual arts by bringing in the elements of drawing, gesture, narration, abstraction, and composition. Paintings range from representational and naturalistic to chiaroscuro, abstract, narrative, and more. I plan to use painting in the classroom because it allows students to openly represent objects, scenery, people, and one's self in a format that is fluid and expressive. As a child moves their paintbrush across a surface, they are developing emotionally, cognitively, and physically. Painting is an emotional and creative outlet that supports cognitive development. According to the American Association of School Administrators, art helps develop "neural connections that prepare the brain for learning." The activity of painting also allows critical thinking development – the choice of color, pattern, and design provides for development through representation and exploring sophisticated techniques while challenging the students to think more deeply and abstractly.

In schools today, students are often required to find the correct answer. Painting does not follow this specific system; it does not expect a right or wrong response. Through art, students can creatively express and develop their artistic representations without strict limitations and guidelines. Painting allows students to experiment and test a variety of techniques without the fear of failure. It provides open forms of expression and a sense of confidence in the process of painting as well as when viewing the final product. Students can also use painting to express

their emotions more clearly than talking about them. Art can allow students who are unsure of their feelings to place them into their artwork. Giving a glimpse into their emotional state and helping students work through any complicated situations or emotions. The act of painting is relaxing; the repetitive motions of pushing and pulling the brush across the paper is quite soothing. Art engages students to practice their creativity in a hands-on way, expressing their styles. In this way, students can find a more profound sense of self and understanding of their interests.

Painting can enhance the topic of science, more specifically, the subject of plants growing in a lifecycle, by using the medium to record information and observations. Students can use different types of plants, seeds, fruits, vegetables, and flowers as stamps. They can press the materials into the paint and then onto the paper to see the different patterns and textures on each. Then the students can compare each painting stamp to tell the similarities and differences of each material. Another way to integrate painting into this topic would be for the students to paint each part of a particular plant's lifecycle.

My personal feelings regarding the integration of the arts, and more specifically, painting, is that it is truly beneficial for students to use to practice interdisciplinary learning. Students can use natural materials to paint from reference or as stamps to practice the concepts of science and write down their observations to practice literacy. History connections are tied in by comparing this style of art and representation to the techniques used in the Gyo-taku paintings. Finally, math is connected by counting the number of patterns the students see and using the numbers to practice addition, subtraction, multiplication, and division facts. Students can also use halves of apples as stamps, and use paint to show the seeds and shapes within an apple. The students can

tie in math by adding and subtracting the forms of the seeds and the inner star shape of the fruit in the prints. History and literacy connections can be made by speaking of George Washington's story of the apple tree and reading a story of Johnny Appleseed.

With no limitations, the students can express their understanding of the topic of science through their individual creative perspectives. More so, by using painting in science, the students will be able to practice inquiry-based learning by choosing what plant lifecycle to represent, and exploring and observing variations of plants by studying the specific aspects of each plant, seed, fruit, vegetable, and flower. Painting allows students to think with an open mind, approaching situations in a variety of ways, and finding multiple ways to solve problems or create new ideas for academic approaches. This practice, in turn, ties in with the concepts of STEM that promote the growth mindset that painting encourages.

Painting and other arts, in general, can be used to create interdisciplinary lessons, discussions, or activities in the classroom. One example of an interdisciplinary lesson where a painting integrates concepts across STEM content and pedagogy is from the National Gallery of Art. By using the painting titled *Cakes* by artist Wayne Thiebaud, I would introduce the students to the concepts of fractions, problem-solving, money and word problems, sorting, and classifying while also creating a bold cake painting digitally or with classroom materials. This math lesson can then be connected to multiple content areas by focusing on a specific element in the artwork, the topic of mixing colors. Students can observe how colors blend depending on hue, tint, and value in the paint. Then can observe colors mixing from food coloring in water, and colors mixing from different plastic coverings on a flashlight. Students can then discuss how light works, how every color creates white light, and darkness is the absence of color. The students would have the ability to use light and paint to experiment. Students in pairs would take turns

picking a color such as red, blue, yellow, or green for the lenses of a flashlight and shine it on a piece of paper while their partner paints the color they see. The partners would switch and repeat the activity on the freshly painted area to see how the color mixing of paint differed from the light. The mentioned activities connect to the elements of STEM due to the students' ability to practice inquiry-based learning through experimentation, engineering design, mathematics, and technology through online art platforms. For a Social Studies connection, the students can then be introduced to the history of light and the creation and technology of the light bulb. Literacy can be tied into each lesson by providing the students with a journal for each subject and asking them to write down their answers for guiding questions and their observations from each experience. In the journals, the students can write down any thoughts they have, can draw pictures of what they research, can ask questions, and can hand me the journal to receive the answer. The journal would be a safe place for free thought.

Art-related activities that especially involve painting are an excellent way to continue the practice of inquiry-based learning in interdisciplinary based lessons. Art can also allow students to develop their critical thinking, communication, and collaboration skills when answering guided questions and promoting thoughtful discussions. Painting is a wonderful tool for the integration of art throughout academic disciplines that can also promote cognitive and emotional growth. It is a tool for observation, design, technological understanding, problem-solving, mathematical reasoning, and an excellent source for creating lasting and meaningful connections across subjects of learning.

Works Cited

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