

Critical Intervention/Personal Voice Action Plan

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## **Introduction**

Throughout the Covid-19 pandemic learning and teaching has been adapted, changed, and progressed beyond the classroom. Remote learning and video conferencing saw widespread adoption throughout 2020. Subjects based on reading, memorization, and analysis translate well into a Google Classroom + Zoom format. Subjects that call for expression and exploration were the most affected by the recent changes in the delivery of information.

Science and Art have always shared a connection, often exploring ideas unseen or previously unknown. Both subjects house methods of exploration that result in the creation and discovery of solutions. The process of artmaking can be likened to the process of scientific discovery, the final result could not be accomplished without attention to the process. Moving beyond the boxes that subjugate knowledge into separate disciplines, scientific knowledge and inquiry can be incorporated into the art classroom. Equally so, artmaking can easily and effectively be incorporated into the science classroom.

## **The Marriage of Art and Science**

The complex marriage of Art and Science is not a new concept, for centuries the power-dynamic and connection between the two have evolved. As early as the 1960's art programs have been challenged by the "increased emphasis on science in the elementary school"(Lembach, 1961, p. 8). John Lembach (1961) wrote to clarify misconceptions about art during a time of fears of an atomic war with Russia. One of the first misconceptions about art is that "Art is not concerned with the truth" (Lembach, 1961). Both Science and Art are concerned with truth.

Scientific truth is verifiable and applicable, based on material fact; while Art is concerned with inward truth, a felt rightness and manfulness of ideas and feelings. Another important misconception noted by Lembach (1961) is “Art is opposed to Science”. This misconception is resolved by clarifying art is usually an individual matter whereas science is generally a group matter (p. 8). This is particularly true of interpretations and meaning assigned after the experiment or artwork is completed. The implications of artistic discovery art not limited by “the artistic community” as is the case with scientific discovery. One final misconception of importance is that “Art is not necessarily in a world of science” (Lembach, 1961). This misconception has remained throughout the history of art education, Lembach notes, “Science demands breadth and flexibility. The arts provide such breadth and flexibility, art is as necessary as science is necessary today (p. 9).

### **Holistic Learning & Integration**

Bob Samples and Bill Hammond (1985) wrote about the importance of holistic teaching and allowing students to learn through their learning input and output. This means that teaching can be structured so that it selectively excites various parts of the brain both in the way the assignment is given (input) and in what assignment asks the students to do (output) (Samples & Hammond, 1985, p. 40). Integrating Science and Art can lead to a better understanding of the natural world. Petty (1985) “I find both essential not only to wildlife study in particular but also to grade school education as a whole”(p. 6). In either class, an interdisciplinary approach can be taken to explore and document wild and plant life. Particularly, in a time of social distancing, the importance of outdoor activities is elevated. Observation drawing allows for students to improve

their drawing abilities, connect with nature, and explore an inter-personal connection to the subject.

### **Design Thinking and STEAM**

The recent push for Science, Technology, Engineering, and Mathematics (STEM) education introduces a design process to science classrooms, some educators have also pushed for the artistic or creative process to become part of STEM education (Bequette and Bequette, 2012, p. 40). Almost ten years later the widespread adoption of STEAM has allowed schools to move past the idea of knowledge divided by discipline. Teachers can work together to introduce concepts from different perspectives. Design thinking is a cyclical process that first identifies a problem and works towards creating a solution. Students are encouraged to test possible solutions and to rework ideas collaboratively. In this way students are not limited to previous ideas or concepts, freedom of expression and exploration are encouraged. The learning process becomes a process of thinking, testing, and tinkering; similar to the process of a scientist.

### **Contemporary Perspectives**

The artist/scientist archetype has been around for centuries and was best known during the Renaissance. (Hunter-Doniger, 2021, p.16). Hunter-Doniger (2021) discussed the concepts of artists and scientists with children from the Camp Innovate (pseudonym). Students agreed that artists and scientists are both researchers who need to observe and explore to make their own discoveries (p.17-18). This approach to curriculum development is deeply reliant on the needs,

interests, and passions of the students and allows for the natural abundance of the earth to foster learning. Hunter-Doniger notes, “The children adopted the mindset of investigators and generated deeper descriptions than they would have by simply recalling their observations or looking them up in a library” (2017).

### **Reflection**

My most recent teaching experience allowed me to implement an artistic approach to Earth Science and a STEAM approach to Studio Art. Students enrolled in both my classes gained a particularly interdisciplinary approach to learning. One particular lesson I found successful during the instruction of standardized earth science curriculum was to encourage students to think about “Longitude” in terms of a pumpkin. I taught both science and art out of the same classroom. Pumpkins from a still life became teaching objects to show the vertical lines of longitude. Students created “Pumpkins of Longitude”. In the same spirit of exploration, the minerals and stones studied and classified in my Earth Science class became objects of student exploration for observational drawings. The interdisciplinary of art and science can lead to new methods of teaching and exploration. My presentation will explore the importance of Science and Art within an interdisciplinary education.

**References:**

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