

# Arts-Science Approach for Gifted Learners

Many students who attend Polaris at Ebert Elementary School live dispersed throughout our city in neighborhoods flourishing with thriving artists. Our school promotes an arts-science integration approach to learning, which we believe has been instrumental in making Polaris the highest performing elementary school in the Denver Public School (DPS) District. Our arts-science magnet school takes advantage of the many culturally based resources available, in most cases, within walking distance from our school. Our K-5 school, with more than 300 students, has proudly taken the lead in meeting the needs of highly gifted and high-achieving students. We are the first independent site in our district dedicated to these learners. We believe our program serves as a model for all principals to support the giftedness in each of their students, and our accomplishments can be replicated in any school.

## Arts Integration Defined

The John F. Kennedy Center for the Performing Arts defines arts integration as “an approach to teaching in which students construct and demonstrate understanding through an art form.” The goal of arts integration remains centered on increasing content subject area knowledge while simultaneously developing a greater understanding and appreciation of the arts.

Various studies have shown that arts education consistently improves individual achievement, whether through traditional arts classes, extracurricular arts activities, or unique arts projects. In 2004, the Dana Arts and Cognition Consortium (DACC) assembled neurologists from seven U.S. universities to study how arts training can enhance academic performance. Findings demonstrate that young people interested in the arts may also exhibit increased motivation to learn in other subject areas. In essence, this interest in the arts—painting, music, and drama, for example—can boost achievement in other academic areas. According to the DACC study, music training improves memorization skills. The DACC study also found links between the “practice of music and skills in geometrical representation.”

## Innovative Technologies

Polaris implements the arts into sci-



ence content and provides hands-on experiences for our young learners. In this digital age, we'll need to teach students to think critically as they create new ways to demonstrate their knowledge of science, technology, engineering, and mathematics literacy (STEM) to prospective employers. By approaching STEM with an added arts component, STEAM, students can include imagination and playfulness in their learning, thus encouraging more active engagement and innovation. Our students do a number of projects throughout the year which we have posted, along with our curriculum program, at <http://bit.ly/17S6DJM>.

One of Polaris' favorite ways to integrate the arts and science starts when teachers select a science unit that lends itself to enrichment through animation. We use SAM Animation software from iCreate to Educate. The value of this software lies in hands-on-creation, simple user-interface,

and cross-curricular integration. SAM allows students to capture still images from a webcam or camera on a mobile device that can be played back in movie form like a digital flip book. Watching our students working in their small groups to bring themes like geology, ecology, food chains, and animal behavior to life in story animation confirms our belief that content areas are enriched through art by making the learning experience meaningful and fun. We find that hands-on exploration helps students significantly grasp STEM concepts. When students plan, explain, and create videos, they become authors and producers of their own knowledge, rather than passive recipients of classroom lessons.

In pre- and post-assessments of students using SAM Animation, we've noticed the following results:

- A 15 percent increase in students who “like science and investigations;”
- A 34 percent increase in fourth and fifth-grade students who want more science in school; and
- A 40 percent increase in children's ability to link observation with the creation of scientific ideas.

## Creativity on Display

Polaris showcases various projects that demonstrate differentiated learning. For example, Polaris students have created art sculptures for our playground, ranging from a large-scale metaphor model to a feng shui geomagnetism garden. Our playground houses a model of a rotating sun where students roll a small blue marble representing earth to a distance they feel represents the real distance between the earth and sun. Another sculpture has a kinetic design that helps students learn about magnetism and heat transfer. Students of all ages have transferred the knowledge they've learned in the classroom into structures they've built for others to enjoy for years to come.

Theater also plays an important part in our students' learning. Every

spring, our fifth graders perform in the Annual DPS Shakespeare Festival. Each class prepares a section of a Shakespearean play and earns stage time in an audition. Students are scored on staging, memorization, projections, and other theatrical measures. These thespians then attend the festival to perform on “street theater” type stages in the Denver Performing Arts Complex.

## Parental Involvement

Parent volunteers help Polaris to thrive. Our parents have helped with the sculpture creations and SAM movies, but they augment our curriculum in even more magnanimous ways. Each quarter, our teachers, volunteers, and parents step forward to share their talents and skills through an electives program. These lessons offer enrichment beyond the core curriculum and give students an opportunity to select classes based on their interests and passions. Students choose two hour-long electives per quarter, with selections ranging from hip hop to yoga to animating the masterpieces.

We firmly believe that collaboration between students, parents, and teachers assures an innovative, culturally rich learning environment where differences are supported and celebrated. Our SAM Animation program came to us thanks to a parent who saw the software in action and became the driving force behind SAM being fully integrated into our school.

Polaris' success did not happen overnight; we spent several years reflecting on our academic offerings and refining our approach. For school leaders interested in adding an arts-science program to their schools, I encourage you to reach out to nearby schools that have a similar approach. Or, come visit us in Denver to learn how we've implemented this curriculum. You may begin one subject or area at a time, but with effort it will yield exceptional results. 

Karin Johnson is principal of Polaris at Ebert Elementary School in Denver, Colorado.

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