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Table of Contents

If you're viewing this document online, you can click any of the topics below to link directly to that section.

Integrating the Arts into the Curriculum for Gifted Students. ERIC Digest.....	1
LANGUAGE ARTS LEARNING GOALS.....	2
SOCIAL STUDIES LEARNING GOALS.....	4
SCIENCE AND MATHEMATICS LEARNING GOALS.....	4
CONCLUSION.....	6
SOURCES.....	6



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Studies have shown that the arts can significantly advance gifted students' academic

and creative abilities and cognitive functioning (e.g., Hetland, 2000; Seeley, 1994; Walders, 2002; and Willet, 1992). This is a strong rationale for making the arts an essential feature of gifted education. Goertz (2002) envisions art instruction as the "fourth R" in education and demonstrates how it increases the skills of observation, abstract thinking, and problem analysis.

Education in art is an invitation to use the reasoning skills of an artist. The artist visualizes and sets goals to find and define the problem, chooses techniques to collect data, and then evaluates and revises the problem solution with imagination in order to create....The artist, in his or her creative process, requires a high-order thought process (p. 476).

When integrating the arts into the curriculum, teachers can design experiences that are tied to the unique needs, interests, and abilities of gifted students and challenge them to perform more complex and sophisticated tasks. Teachers can ask themselves: What needs do my arts activities meet? What precisely do I want my gifted students to learn and how will I know that these activities are stimulating their growth? Studies on differentiated instruction and the "parallel curriculum" (Heacox, 2002; Tomlinson et al., 2002) emphasize the importance of establishing clear learning goals before designing alternative learning experiences. The following are examples of learning goals and activities that integrate the arts with the language arts, social studies, and mathematics and science curricula.

LANGUAGE ARTS LEARNING GOALS

The arts can strengthen all areas of oral and written communication and, for gifted students, provide more opportunities for creative problem-solving and analytical thinking.



Reading



* Enhance critical thinking. While reading a story, students draw, sketch, or paint whatever is most vivid to them. It could be a color, a mood, an image, a symbol, a scene, or an idea. In small groups, they discuss their artwork and its significance to the story, and what they think will happen by the end.



* Stimulate analytical thinking and imaginative interpretation. Work with the children to create a chamber theater piece out of a short story. Ask them to select the most important scenes and explain why they chose them. Choose students to be narrators

and others to speak and act the parts of the characters.



* Sharpen awareness of motivation and points of view. Children choose a conflict, issue, or problem raised by the text and stage a debate, with different students assuming the role of specific characters.



Writing



* Stimulate novel ideas for stories. Provide visual catalysts (e.g., paintings, photographs) for students to imagine what happened before and after the scenes depicted. Use the visual image as the climactic moment of a story, the moment after the climax, or the moment before.



* Undertake investigative research. Children read a story of a painting that disappeared and imagine how they-the art detectives-tracked it down. Or they can write a fictional piece on how they discovered a painting and exposed the forgeries. What gave it away?



* Explore multiple points of view. As an extension of the previous activity, the students could write historical fiction on the extraordinary journey of the Mona Lisa from King Louis XIV's palace in Versailles to its permanent home in the Louvre. (They could also choose another famous art piece.) They could write it from the point of view of the painting, the people who had it, or the people who were looking for it.



* Synthesize different sources for a news story. Drawing on a variety of sources (photographs, paintings, music, and written material), children write a sketch, poem, script, or essay about a current event reported in the paper. The children then tell their story from a variety of viewpoints: this individual's friend, teacher, mother or father, sister or brother, or the family dog.



* Analyze a music composition (e.g., classical, rock, folk) and create a short script that

follows the tone, pace, movements, etc. of this music. Students select a piece of music, listen to the different instruments and elements, and assess how the music could be a conversation.

SOCIAL STUDIES LEARNING GOALS

Studying history, geography, and other social studies subjects through the arts (and vice versa) enables gifted students to investigate topics from multiple viewpoints and in more depth. As they create vivid representations of significant events, processes, and people, they analyze, assess, and interpret the facts and images before them. Activities such as the following use imagination and analytical abilities in new ways:



* Analyze the life of a famous historical figure. Students study the portraits of this person, musical pieces composed for them, stories told about them, and films made in their honor along with textual sources. What do visual representations tell them about this person? Students pretend to be this historical figure, choose an issue that they feel passionate about and write a speech as this person. They can express their ideas through visual art, mime, or dramatics.



* Apply an art phenomenon to social/historical reality. Students act as reporters who travel back in time to cover important events in an artistic movement. They analyze a phenomenon (such as impressionism) and write a newspaper article about how this phenomenon responds to certain social, political, and historical conditions. What does impressionism tell the students about this time? How was the technique of impressionism a break with what existed before and how did this relate to the time?



* Investigate and analyze the contrasting views of two sides of a conflict, issue, or struggle. Students examine the art of 19th century western artists versus that of African populations and grapple with the European belief in African "primitivism." How are the colonizers and colonized represented and why? What does this tell students about the artists and their world? How does the art of the colonized Africans express their social and political condition? Students write a position paper on 19th century European views of Africans and Africa, as seen through their art and writing (they can also do the reverse). They create an art gallery for student work that depicts their ideas.

SCIENCE AND MATHEMATICS LEARNING GOALS

Science and mathematics have immediate ties to the arts. Pop art's Roy Liechtenstein said, "Organized perception is what art is all about" (Piper 1981, p. 95). Leonardo Da Vinci studied perspective and depth in painting, applied mathematics and the science of color to every aspect of his work, explored anatomy, invented machines and sketched designs for technology far in advance of his time. Thomas Locker, a contemporary artist, has integrated science and art in a format designed especially for teachers' classrooms. His Sky Tree Portfolio (1995), Cloud Dance (2000), and Water Dance (1997) contain exquisite paintings of nature with information and activities that promote scientific inquiry.

Science, mathematics, and art all concern themselves with the true nature of things. Are things what they seem? Should the arts depict things as people experience them or as they are? The following activities suggest ways to blend the arts with math and science in such a way that gifted students can examine real-world applications of fundamental concepts and ideas (such as distance, color, perspective, proportion).



* Apply a scientific concept to a problem in art. Have students explore a scientific subject (such as light). Place paintings together that seem particularly suited to this subject and ask children to discuss how artists represent the science of light—its directions, color at different times of the day, its interaction with water and color, etc. Students can select some aspect of light that interests them scientifically and, like artists, think of ways to represent this visually through painting, collage, or sketches.



* Analyze the nature of matter using the arts and physics as sources. Both science and art deal with illusion—what seems to be but is not. Using visual art (e.g., surrealists), modern dance performance and other sources, students write down the assumptions artists (particularly experimental artists) are making about the nature of matter. (Is it always in motion? Is it static? Is it solid and impenetrable as it appears?) Investigate one or more of these assumptions in physics and write an essay justifying or questioning artistic representations.



* Sharpen visual perception and increase ability to estimate accurately. Artists often test their perceptions by estimating distances and heights. Students can test their perceptions by putting a stick into the ground (so that six inches show) on a sunny day and measure the length of the shadow cast by the six-inch stick. Next, measure the length of the shadow of a nearby tree. How would the students calculate the height of the tree in inches? In feet? Let them devise their own system for figuring this out. They can diagram, use paintings, photographs, etc.

CONCLUSION

The activities described here open the door to a new kind of learning experience for gifted students. Integrating the arts into the academic curriculum and the academic curriculum into the arts enable gifted children to make unique discoveries and innovations. Because the arts immerse them in the creative process, they can apply their advanced reasoning and problem-solving abilities in new ways. As previous examples show, these processes also offer an even greater opportunity to the gifted: to bring more of themselves-their own unique insight, ability, and vision-to a subject. Gifted children, many of whom are artistically and/or creatively gifted, are not a dispensable population. They need to feel that their talents can create for them a unique and enduring place in the world. The talented young painter, Alexandra Nechita put it well:

"Sometimes I get so immersed in my paintings I'm just somewhere else. I create my own universe that you get to see little by little through every painting I work at. And every painting I create is part of me going out little by little to all of you." (Nechita 1996, p. 80)

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