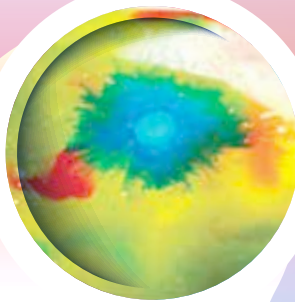


CREATIVE INVESTIGATIONS **IN EARLY ART**

Angela Eckhoff, PhD



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P. O. Box 10, Lewisville, NC 27023
800.638.0928; 877.638.7576 (fax)
www.gryphonhouse.com

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Library of Congress Cataloging-in-Publication Data
[To Come]

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Contents

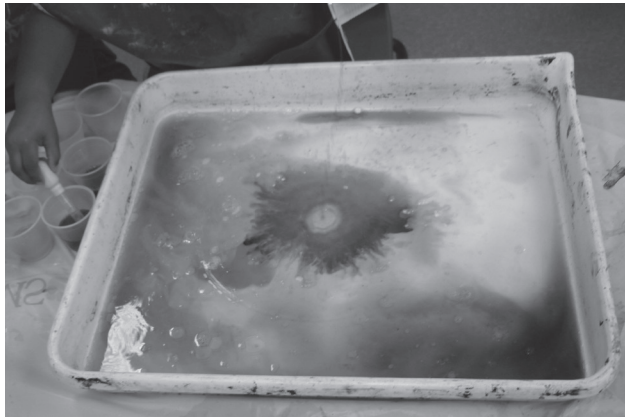
Introduction	xx
1. Creative Investigations in Art— Rich Inquiry in STEAM Learning	xx
2. Connecting Music and Movement to STEM	xx
3. Connecting the Dramatic Arts to STEM	xx
4. Connecting the Visual Arts to STEM	xx
5. Connecting Artists and Artworks to Investigations in STEM ..	xx
References	xx
Index	xx

Introduction

Today, Lara is introducing her class to an integrated science and visual-arts project that she describes as a moving painting. Her students will experiment with color dyes and substances that will resist absorbing the color dyes. For this project, Lara has mixed small containers of water with a variety of colors. She has gathered trays, pipettes, large tubs, and small containers of cooking oil and liquid soap to be used as a resisting agent. Lara invites two children at a time to work alongside her as they explore and create with the materials. As Lara carefully describes the materials available for today's experience, she emphasizes that the children should take their time so that they can observe what happens each time they add a new color or substance.

Matt begins by slowly adding drops of color to his tray. While he works, Lara asks questions about his work, "What happened when you added the red to the yellow?" "Ooh, what color will that make when you add it?"

Following his use of the droppers full of color, Matt adds a few drops of oil, and Lara describes the reaction, "The oil is resisting that color; it's not taking it on." Matt points out the areas that resist and states that they look like clear circles. Matt



goes on to add more colored liquid faster than before by pouring out the colored water in the small cups that Lara has made available. As he pours, he moves a cup around the tray, noting how quickly the colors are mixing together now. Lara continues to support Matt's observations by asking questions and pointing out reactions as they work alongside each other.

Lara and Matt were able to slow down and work alongside each other, which afforded many opportunities to talk about the transformations they were seeing after each new addition to the trays.

Art: The A in STEAM

Art is a natural fit with science, technology, engineering, and math (STEM) investigations. This type of open-ended experience will allow for much discussion and will provide you with many opportunities for informal observations of children's interests and understandings. Each child's experience is going to be different, depending on the materials they choose and the order in which they use them. Open-ended exploration captures students' interests and gets them excited about what they will experience next. The inquiry-process skills in this experience include opportunities for students to make observations, explore, question, make predictions, and conduct simple science investigations.

The visual and performing arts are powerful curricular companions to early science, technology, engineering, and mathematics experiences. It is important for all early childhood educators to create an environment where the arts are a consistent and valued component of the daily life of the classroom; a classroom where the arts are embedded in the experiences of all children and teachers. Embedded arts experiences move beyond the additive approach of an arts-integration model to a more holistic view that values arts experiences that are rooted across the curriculum in meaningful ways. This holistic approach allows teachers and children to experience the visual and performing arts in a deep, meaningful way. The arts serve as a way for children to experience and express wonder, imagination, communication, and thinking. When the arts are integrated into STEM experiences, we can promote the children's abilities to communicate their knowledge and understandings through dance, song, drawing, painting, or sculpture. Guidance for the content in this book comes from the National Art Education Association (NAEA), Early Childhood Issues Group (ECAE), and the National Core Arts Standards from the National Coalition for the Core Arts Standards (NCCAS).

Creative Investigations in Early Art is designed to provide early childhood educators with pedagogical practices, arts-content knowledge, and lesson ideas to scaffold young children's experiences with integrated visual and performing arts. In this book, I present information on contemporary creativity and inquiry-based pedagogical practices that early childhood educators can use to implement arts-rich learning experiences for young children. This book will broaden your understandings of the relationships among STEM content, the role of the learning environment, and supportive pedagogical practices in early childhood classrooms.

When visual and performing arts experiences build upon student interests and understandings and connect STEM-content learning, young children are able to experience meaningful, relevant connections among each content area. This book stresses the importance of encouraging minds-on learning experiences in the early childhood classroom through both guided and independent investigations where every child is actively involved in meaningful ways. Early childhood educators have important roles in early arts-rich STEM experiences and will act as both guides and facilitators throughout the planning, implementation, and assessment of the creative, inquiry-based experiences presented throughout this book.

For young children, arts-rich STEM experiences involve using tools and a variety of arts media and materials, being creative and inventive, developing questions based on observations and firsthand experiences, exploring meaningful content, and sharing their understandings with others.

Creative Investigations in Early Art will support your development of creative experiences in the classroom by helping you to:

- understand the links among the science, technology, engineering, arts, and mathematics disciplines.
- plan cooperative arts-based STEM lessons that will engage all children in your classroom as individuals or when working in small or large groups.
- implement classroom experiences that support children's engagement in

integrated, arts-rich learning on an everyday basis.

- recognize the power of the visual and performing arts to support children's abilities to discover, invent, explore, question, and communicate their understandings of the world.
- document children's knowledge development with authentic work samples and classroom artifacts.

Playful Learning

Play is an essential part of explorations of science in early childhood. Through play, young children learn about themselves, their environment, people, and the world around them. Playful learning encourages children to explore and experiment in situations where they feel comfortable taking risks and delving into the unknown. Children's play in the early childhood classroom can take on many different forms and functions. When children explore, experiment, and cooperate through play, they learn about how the world works. Children need teachers who are supportive of their play and who work to carefully identify play situations in which teacher guidance or involvement are welcome and needed.

Young children use their knowledge and understandings by bringing these ideas into their play to further experiment and clarify them. This process is child driven; the role of the adult is one of supporter, guide, and facilitator. The adult meets each child at his or her own stage of understanding with intentional pedagogical practices that promote questioning and exploration. Teachers can create early childhood classrooms that honor the ways in which children learn and explore by ensuring that young children have ample opportunities for playful learning and exploration. In the role of supporter, guide, and facilitator, the teacher carefully observes children's play and helps to scaffold children's thinking through questioning; providing additional, supportive materials; and offering opportunities for guided learning. The visual and performing arts encourage positive dispositions to play in the classroom because of the emphasis on discovery and invention as children explore and manipulate a wide variety of arts media.

Guided Explorations in Early Arts-Rich STEM Experiences

Understanding and applying the pedagogical practices that best support young children as they work in the visual arts is an important component to developing a comprehensive approach. Supporting young children as they observe art, explore media and techniques, and create their own works of art requires careful attention to the many facets of art making and art viewing. In her article “Three Orientations to Arts in the Primary Grades,” researcher Liora Bresler points out that in a guided-exploration approach, a teacher will work alongside students during visual-arts experiences to support observation and listening skills, to encourage artistic expression, and to consider the aesthetic qualities in arts. A guided-exploration approach encourages young learners to engage deeply during arts-rich experiences, which helps to encourage creative, artistic, and aesthetic thinking while children are working.

Guided Exploration Orientation to Classroom Arts Practices

- In the guided-exploration orientation, the teacher’s responsibilities include helping children learn to observe, to listen, to communicate their sensitivities through artistic expression, and to consider the aesthetic qualities in arts.
- The guided-exploration orientation involves intensive teaching on the part of the teacher, including providing students with personally meaningful feedback on their work and encouragement to continue to build their understandings.
- Student engagement in arts experiences includes effort, concentration, awareness, and thought.

(Bresler, 1993)

As you plan lessons that integrate the arts and engineering and technology, consider the guidance in the *Position Statement on Early*

Childhood Art Education from the Early Childhood Arts Educator's Issues Group of the NAEA about the types and qualities supportive of arts experiences in early childhood.

Eight Principles for Quality Arts Education for Young Children

- A child needs an organized, materials-rich environment that invites discovery, interaction, sensory and kinesthetic exploration, wonder, inquiry, and imagination.
- A child needs access to a wide variety of art media that support two- and three-dimensional expression.
- A child needs plenty of unhurried time, both structured and unstructured, to explore the sensory and kinesthetic properties of materials and to develop skills and concepts in re-presenting his or her experiences.
- A child needs a responsive educator who values young children's diverse abilities, interests, questions, ideas, and cultural experiences, including popular culture.
- A child needs a responsive educator who can support appropriate development of skills, use, and care of materials.
- A child needs a responsive educator who understands and supports the unique ways that young children represent their thoughts, feelings, and perceptions through actual, virtual, and experimental media and processes.
- A child needs a responsive educator who supports the multiple ways that young children create meaning through conversation, storytelling, sensory-kinesthetic exploration, play, dramatics, song, and art making.
- A child needs a responsive educator who carefully observes, listens to, and reflects upon children's learning, using multiple forms of documentation and assessment.

Building Creative Arts-Rich STEM Experiences in the Classroom

Early childhood educators have essential roles in the development of children's creative-thinking skills and in creating supportive classroom environments in which children's creative skills are nurtured. To incorporate creative learning experiences in the classroom, teachers must design lessons that include opportunities for critical thinking and reflection while also maintaining a focus on student interest. In addition, teachers must recognize that creativity is a learning process that encourages social interaction and promotes individual ownership of ideas. In the classroom, creativity is a part of a learning process based upon children's interests and involves reflection and interaction with other children and adults and requires children to document and report on their thinking and experiences. When young children are provided opportunities to personally engage with challenging, reflective learning experiences, they are building critical and creative thinking skills.

The lesson ideas and classroom vignettes shared throughout this book incorporate opportunities to build children's understandings of the visual and performing arts, science, technology, engineering, and mathematics while also promoting children's creative-thinking skills. Each lesson includes critical elements of inquiry and creative thinking: open-ended tasks, opportunities for social interaction, and opportunities for reflection and elaboration.

Open-ended tasks provide young learners with opportunities to experiment with new ideas and engage in inquiry. Because open-ended tasks promote idea experimentation, they encourage children to focus on the processes of learning rather than on the need to arrive at a solitary correct answer. Gaining experience with idea experimentation will help support children's acceptance of ambiguity and willingness to make mistakes, allowing them to gain confidence in their problem-solving abilities.

Providing opportunities for small-group works and social interaction is a crucial component of creative thinking. Working in pairs or small groups

will help to promote brainstorming and will allow children to learn from and with each other. Such tasks will also support children's experiences with reflection and idea elaboration. These skills are important cognitive tools that allow children to learn from their own experiences and examine their own learning process. Employing these components of creativity in the classroom will help to create a rich, engaging learning environment for all students.

Recommended Practices and Content Coverage in Early Arts-Rich STEM Experiences

The content of the lessons presented in each chapter of this book are based upon the guiding recommendations in the NAEA Early Childhood Issues Group's position statement and on the National Core Arts Standards from the National Coalition for the Core Arts Standards (NCCAS). Both of these guiding documents and standards are designed for use with young children, and we can use them to help us determine the types of experiences that promote meaningful engagement in the arts for our students. Every lesson presented throughout each chapter of this book is designed to encourage you to explore and implement the types of art-rich STEM learning that will build children's thinking, exploration, questioning, and documentation skills in addition to curricular content knowledge. Together, we will explore the types of lessons and approaches to pedagogy that will help your students learn much more than the conceptual facts. We will look for the opportunities that arise during your interactions with students in which you can support, extend, and encourage their thinking with conversation and questioning in a natural manner.

Every lesson you encounter in this book will ask you to carefully consider your interactions with young children as well as the classroom environment. The interplay among children, teachers, and the classroom environment are all central to the process of learning. The concept of possibility thinking encourages teachers to consider how asking questions,

play, supportive classrooms, imagination, innovation, and risk taking affect the processes of thinking and learning.

Possibility Thinking—A Dynamic Interplay between Children and Teachers

- **Posing Questions:** Questions from children are acknowledged and celebrated by teachers. Teachers’ questions encourage inquiry
- **Play:** The schedule provides opportunities for extended play periods.
- **Immersion:** The children are immersed in a benign environment that is free from criticism and mockery.
- **Innovation:** Teachers closely observe innovations in student thinking so that they can prompt and encourage.
- **Being imaginative:** Teachers provide ample opportunities to meld imagination and curriculum content.
- **Self-determination and risk taking:** Deep involvement and risk taking are encouraged by both children and teachers.

(Craft, et al., 2012)

Promoting Creative, Arts-Rich Learning in the STEM Disciplines

<i>Classroom Components</i>	<i>Supportive Approaches in the Early Childhood Classroom</i>
Physical environment	<ul style="list-style-type: none"> • Offer flexible spaces with moveable furnishings that provide space for exploration, display, and storage. Provide spaces that can accommodate and adapt for both small and large groups.

<i>Classroom Components</i>	<i>Supportive Approaches in the Early Childhood Classroom</i>
Role of the teacher	<ul style="list-style-type: none"> • Provide opportunities for children to document their thinking through drawing, writing, and verbal means. • Encourage children to share their thoughts with a large or small group. • Ask questions to promote deep thinking and problem solving. • Provide materials that can support student inquiry. • Closely monitor student thinking and exploration to scaffold experiences.
Peer-to-peer relationships	<ul style="list-style-type: none"> • Provide opportunities for children to share their problem-solving experiences. • Encourage and support children’s use of inquiry-based and creative thinking. • Provide opportunities for children to ask questions, design experiments, plan, work in pairs or small groups, test ideas, and document their experiences.
Structure of arts-rich STEM experiences	<ul style="list-style-type: none"> • Provide opportunities for children to connect the arts to STEM content areas. • Provide opportunities for children to work on problems and projects for extended periods of time and to revisit previous experiences and lessons multiple times to encourage mastery and promote confidence.
Parent and community engagement	<ul style="list-style-type: none"> • Provide opportunities to connect arts-rich STEM experiences into the community and the children’s daily lives. • Engage families throughout the learning process through regular documentation of children’s experiences.

Organization of the Book

This book is based upon broad categories for early arts-rich STEM explorations: music and movement in STEM, dramatic arts in STEM, visual arts in STEM, and artists and artworks in STEM.

Each chapter begins with a section in which you can find background information on the visual- or performing-arts content presented throughout the chapter. Each chapter also features classroom vignettes to help bring the information on content and pedagogical information to life. Woven throughout the book are arts-rich STEM lessons for young children that are built upon pedagogical practices for creative, inquiry-based thinking. You will also find information on recommended children's books related to each chapter's content.

Sample Lesson Idea

Dancing Ribbons

Topic:

Force, motion, fine- and gross-motor movement, and design

Objectives:

Children will participate in the creation of a ribbon stick and will explore motion and movement with the stick as they dance and move.

Materials:

Wooden sticks or dowels 12–18 inches in length (1 per child)

Various lengths of ribbon, cord, lace strips, and yarn

Creativity Skills:

Exploration

Visualization

Hot glue gun and glue sticks (adult use only)

Overview:

For this experience, children will be creating their own ribbon sticks to use during music and movement activities. As the experience will involve the use of hot glue, it's best to work with small groups of children. It can be helpful to show the children an example of a ribbon stick before beginning to create their own, if this is the first time in using ribbon sticks in your classroom.

Activity Steps:

1. Introduce the children to the various ribbons they can use to create their stick. Ask them to consider how materials of different weights and lengths will react when moved during dancing.
2. Invite each child to choose the materials she wants to use.
3. Assist them in wrapping the ribbons around the stick and hot gluing the ribbons into place.
4. Once the glue has cooled, invite the children to try various movements: fast and slow, big movements, little movements, and so on, and introduce music of varying tempos.

Documentation:

Take notes on the children's abilities to match their actions to varying movements and tempos.

Extension Lesson:

This lesson can be extended by encouraging the children to create their own movements. For example, ask, "What do happy movements look like? What do sad movements look like?" Or encourage them to match their movements to recorded songs.

PLAY draw, DESIGN, CRAFT & imagine... INSPIRE CREATIVITY!

Explore how art is a natural fit with science, technology, engineering, and math (STEM) investigations!

Did you know the visual and performing arts are powerful curricular companions to early STEM experiences? The arts help young learners nurture and expand their creative- and critical-thinking, communication, and problem-solving skills.

Open-ended art exploration captures students' interests and gets them excited about what they will experience next. These experiences include opportunities for students to observe, explore, question, predict, and even conduct simple science investigations.

With guidance from the National Art Education Association (NAEA) Early Childhood Issues Group (ECAE) and the National Core Arts Standards from the National Coalition for the Core Arts Standards (NCCAS), *Creative Investigations in Early Art* provides early childhood educators with pedagogical practices, arts-content knowledge, and lesson ideas to build young children's experiences with integrated visual and performing arts.

Teachers will learn practical ideas for intentionally fostering young children's hands-on, minds-on explorations connecting the following areas of the creative arts to STEM:

- Matter and physical properties
- Physical and chemical changes
- Conservation and sustainability
- Earth and space systems

Guide your young learners as they explore both on their own and collaboratively to develop their ability to innovate and imagine.



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GH 15949

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