### CONTENTS

#### You Are a STEAM Teacher

NANCY WALKUP

#### PART 1: SCIENCE

2 **A Fish Story** A Loving Legacy for a Retired Teacher CRAIG HINSHAW

#### 6 The Cycles of Metamorphosis Integrating Art and Science NANCY WALKUP

#### 8 Plastic Landscapes Integrating Art and Recycling EUNJUNG CHANG AND AMBER HARRAR

## 12 Beads & Seeds

A Collaboration Between an Art Museum and a Botanical Garden PATRICIA SIGALA AND MOLLIE PARSONS

#### 16 **Magnificent Marbling** Playing with the Concept of Surface Tension DONNA CARIOLA

20 **Cycles of Life** Frog Metamorphosis in Clay NAOMI SWYERS

#### 24 **The Artist as Naturalist** Correlating Art and Natural Science RACHEL WINTEMBERG

30 Wondrous Watercolor Cell Illustrations

Revealing the Beauty of Biological Cells TRACY HARE AND JENN FEIERABEND



#### **PART 2: TECHNOLOGY**

- 36 Terrific Tessellations
  Exploring Hands-on and Digital Tessellations
  TRICIA FUGLESTAD
- 40 **3D Printing in the Art Room** How to Get Started with 3D Printing ALICE GENTILI
- 44 **Music-Infused Art** An Interactive Art and Music Collaboration LINDA SCHOBER
- 48 **Radiant Robots** Bringing Light to Art LYNN BECK

#### 52 The World of Fractals

Connecting Math, Science, and Digital Art KEVIN FOGELSON

56 Portrait Triptychs

An Unusual Approach to Portrait Photography MICHAEL SACCO

60 Proofs & Spoofs

Creating Movie Posters and Trailers MELODY WEINTRAUB

64 The Camera Obscura & Pinhole Photography

Building and Using a Pinhole Camera NICOLE CROY

#### **PART 3: ENGINEERING**

70 Steampunk Bugs Connecting Art and Engineering LEIGH DRAKE

#### 74 Imagination Installations Newspaper Roll Sculptures

MOLLY MCNEECE

#### 78 Horse Sense A Yearlong Public Art Installation SKIPPER BENNETT AND DEBRA STRANDBERG

#### 82 Mod Pods

Building Modular Structures NANCY WALKUP

- 86 **Building Castles of Their Own** A Trial-and-Error Engineering Challenge RACHEL WINTEMBERG
- 90 Teaching Creative Thinking through Architectural Design

Effective Approaches to Teaching about the Built Environment KIJEONG JEON AND TERESA L. COTNER

94 World's Longest Water Slide A Cardboard Model-Making Collaboration

#### 98 Cardboard Guitars

RACHEL WINTEMBERG

Picasso-Inspired Cardboard Relief Sculptures LUCY RUSSO



#### **PART 4: MATHEMATICS**

104 The Art and Science of Trihexaflexagons

> Geometric Paper Constructions PHYLLIS LEVINE BROWN

#### 110 The Many Faces of Giuseppe Arcimboldo

Contemporizing a Historical Artist's Approach to Art LEIGH DRAKE

#### 114 Taking a Turn

Collaboratively Exploring Rotational Symmetry TRICIA FUGLESTAD

#### 118 Color Wheel Windows

Combining Radial Symmetry and Color Theory STEPHANIE LEONARD

#### 120 Buzzing Bugs & Creepy Crawlies

Where Art, Science, and Mathematics Meet MARY COY

#### 124 Fold, Cut, Adhere

Experimenting with Paper, Light, and Shadows KARI GIORDANO

#### 130 Squaring the Circle

Cut-Paper Symmetry Collage JANE COPP

#### 132 Gridded by Design

A Symmetrical Cut Paper Relief MICHAEL SACCO



# You Are a STEAM Teacher

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Initially promoted by the Rhode Island School of Design, STEAM education is a response to STEM, an educational approach with a focus on the meaningful integration of science, technology, engineering, and mathematics. STEAM adds art to the acronym, underscoring the importance of innovation and creativity.

Through a quality STEAM approach to learning, students participate in engaging experiences to develop twenty-first century skills such as creativity and imagination, critical thinking, problem solving, and collaboration. Design thinking, a process that facilitates the design of objects, information, environments, and experiences, is also a natural component of STEAM.

The significance of STEAM is evidenced in a National Art Education Association

position paper on STEAM education, which supports the belief that "STEAM helps make learning concepts relevant and enticing to young children by highlighting how artists use STEM knowledge to enhance their art or solve problems. It also provides context for the importance of STEM knowledge in careers in the arts (e.g., musician, painter, sculptor, and dancer)."

Many art teachers are already working from a STEAM perspective but may not realize it. For example, if you are teaching about the natural world, the built environment, geometric concepts, types of symmetry, color theory, or using technology to create or share art, you may have a STEAM project. In a STEAM artroom, every project starts with art and connects one or more additional disciplines as they naturally apply. For instance, the concept of symmetry is readily found in art, math, and science. Mary Coy's lesson, "Buzzing Bugs & Creepy Crawlies," on page 120, is an example of the integration of these three disciplines. Over the course of the year in a STEAM program, students should work with all of the STEAM disciplines.

Whether you are a STEAM veteran or newbie, it will be a great benefit to your art program if you share what you and your students are doing with STEAM. Reflect on your own curriculum to consider how it may already work with STEAM, and don't be shy about sharing your efforts. This could take the form of actual or online art exhibitions, murals, videos, blog posts, websites, articles, newsletters, or public presentations or performances to educate your administrators, other teachers, parents, and your community.

In this collection, aimed at elementary and middle-school students, *SchoolArts* offers a number of robust approaches to include STEAM in your curriculum. The articles were developed by art educators just like you and published in *SchoolArts* magazine. In each one, the addition of the arts to STEM is made more powerful because of the naturally interdisciplinary and engaging nature of the arts. STEAM also exemplifies the absolute necessity of art in an effective school program. For these reasons, we believe art teachers may be the best teachers of STEAM.

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#### A STEAM Approach...

- is engaging to students.
- encourages creativity and innovation.
- values disciplines equally.
- seamlessly connects disciplines.
- presents open-ended problems that result in individual solutions.
- relates to students' lives.
- is implemented through a wide variety of approaches.
- provides meaningful opportunities to collaborate with others.
- can lead to careers in the arts.
- just naturally makes sense.

#### Resources

- Next Generation Science Standards
  nextgenscience.org
- International Society for Technology in Education (ISTE) Standards iste.org/standards/for-students
- Next Generation Engineering Design Standards nextgenscience.org/searchstandards?keys=Engineering
- Common Core State Standards for Mathematics corestandards.org/Math



















# PART 1

# SCIENCE

#### ELEMENTARY

A Fish Story	2
The Cycles of Metamorphosis	6
Plastic Landscapes	8
Beads & Seeds	12

### MIDDLE SCHOOL

Magnificent Marbling	16
Cycles of Life	20
The Artist as Naturalist	24
Wondrous Watercolor Cell Illustrations	30

# **A FISH STORY**

A LOVING LEGACY FOR A RETIRED TEACHER



The goldfish pond to honor a beloved teacher.

#### Craig Hinshaw

y colleague Janine Kairis and I retired the same year. We had begun teaching at Lamphere schools at about the same time—she in kindergarten and me in art. In between those twenty-some years, we shared much more than teaching. We talked to each other about our young children and our aging fathers. As the years passed, we discussed our children's college careers, spouses, and eventually we shared the joy of grandchildren. Finally, our conversations turned to retirement and life after teaching.

#### A Zoo in the Classroom

I have taught with hundreds of great elementary teachers, but Janine was the only one who kept live animals in her classroom. Class pets included goldfish, a parakeet, and guinea pigs. Cleaning cages, feeding regularly, and carting animals home over school breaks were an added burden. But what students learned from the experience included the responsibility of daily feeding, the giving and receiving of love, and understanding death. "Be gentle" was Janine's instruction to the kindergartners whenever they handled the guinea pigs.

#### The Goldfish Pond

When Janine retired, her goldfish stayed at school (as did I—on a parttime basis). No teacher volunteered to take the aquarium and fish, so we decided to add the two large fish to our school goldfish pond.

As a tribute to Janine, I decided to have each fourth-grader make a clay



#### **OBJECTIVES**

- Use observational drawing to create designs for clay fish.
- Make and install clay fish for a school pond and garden.

#### **ESSENTIAL QUESTION**

How can art be used to honor those important to us?

#### MATERIALS AND RESOURCES

- Images of different kinds of fish
- Clay
- Clay tools
- Glazes
- Wooden dowels

#### NATIONAL VISUAL ART STANDARD

Presenting: Develop and refine artistic techniques and work for presentation.

## NEXT GENERATION SCIENCE STANDARD

Make observations of plants and animals to compare the diversity of life in different habitats.



Students observed live models to draw patterns for clay fish.

goldfish to decorate the pond area. One thing led to another, and we decided to name the pond the Mrs. Kairis Goldfish Pond and invite her back for a dedication ceremony.

#### Making Fish from Life

Students observed live models (goldfish from the pond) and drew them to make paper patterns. They traced their drawings on  $6 \times 10^{\circ}$  (15 x 25 cm) slabs of clay and then carefully cut them out. Using craft sticks, they added scales and other details to their clay fish. While the clay was still moist, I poked a hole into the bottom of each fish with a dowel so it could be made to stand when complete. When the clay fish were dry, I fired them, students glazed them, and I fired them again. Dowels were inserted so the fish could be "planted" in the garden.

#### The Dedication

Prior to the dedication, I asked students (and teachers) to write down something they had learned from Mrs. Kairis. These were compiled into a poster based on the idea of Robert Fulghum's *All I Really Needed to Know I Learned in Kindergarten*. On the day of the dedication, touching words were spoken and hugs given. Janine's husband and two of her grown children were present. It was then I realized that the success of our nature center and the care of the animals could be attributed to Janine's loving guidance.

In closing, this is not a fish story at all; it's a story about love. 👁

Craig Hinshaw is a retired elementary art teacher who taught in the Lamphere School District in Madison Heights, Michigan. He is the author of Clay Connections and Animals, Houses, and People (Poodle Press).



Students added texture by pressing objects into the clay while it was still wet.



Students traced their hand-drawn patterns onto slabs of clay.