CREATIVE SYMMETRY



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School: Gratigny Elementary School

School Location Number: 2241

2026 Idea Packet

For information concerning Ideas with IMPACT opportunities including Adapter and Disseminator grants, please contact:

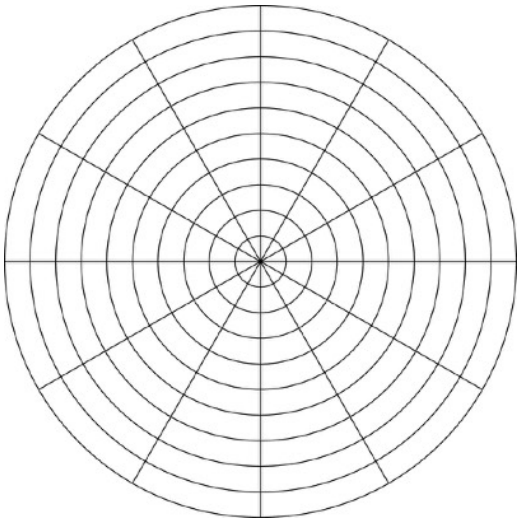
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GOALS AND OBJECTIVES

Workshop Goals for Teachers

By the end of the workshop, participating teachers will be able to:

- Teach symmetry, pattern, and radial balance through a simple hands-on system.
- Use adhesive shapes as a scaffold for complex design thinking.
- Make abstract mathematical concepts visible and hands-on through an art process.
- Manage a structured process that still allows creative freedom and individual artistic decisions.
- Introduce basic printmaking through a handmade printing matrix and repeated stamping.
- Adapt the activity for different grade levels, skill levels, and student needs.
- Incorporate digital color exploration to support artistic decision-making.

Learning Objectives for Students

Upon completing the project, students will be able to:

- Design an original composition within one-sixth of a circle using adhesive shapes.
- Create bilateral (mirror) symmetry by reflecting the placement of shapes across the center line of the sector.
- Use repetition and rotation to build a cohesive radial composition from one printing matrix.
- Use geometric shapes, and optionally organic shapes, to create pattern and visual complexity.
- Understand positive and negative space through the placement of shapes.
- Demonstrate craftsmanship and control during the design and printmaking process.
- Explore color decisions through traditional and/or digital methods.

FLORIDA STANDARDS

MA.4.GR.1.1 - Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size.

MA.4.FR.1.1 - Represent and interpret fractions as parts of a whole and recognize that a fraction can be decomposed into a sum of fractions with the same denominator.

SC.4.N.1.1 - Raise questions about the natural world, use appropriate reference materials to obtain information, conduct investigations, and communicate results.

VA.4.C.1.1 - Apply art concepts and use a variety of sources to create original works of art.

VA.4.O.1.1 - Organize the elements of art to create a unified composition.

COURSE OUTLINE / OVERVIEW

Students use one sector of a circle and adhesive shapes to build a symmetrical printing matrix, then repeat that matrix to create a complete radial mandala.

The project begins with a circle divided into six equal sectors. Students work with one sector only. A center line divides that sector into two matching halves. Using adhesive foam shapes, students create a design on one side and mirror the placement of the shapes on the opposite side, creating bilateral symmetry.

The completed sector becomes the printing matrix. Students apply printmaking ink to the raised adhesive shapes and stamp the same matrix six times around a central point, rotating it after each impression. When the six impressions come together, the repeated sector forms a complete radial composition.

The use of stickers makes the activity accessible and engaging while still requiring precision, planning, and attention to spacing. Students work within the same structure but make individual choices about shape, scale, direction, density, and pattern, producing highly varied results. The final reveal is often the most motivating moment because students see how one small design transforms into a complex whole.

The project naturally supports STEAM connections through geometry, symmetry, rotation, fractions and parts of a whole, printmaking process, observation of patterns in nature, and optional digital color exploration.

LESSON PLAN & STEP-BY-STEP IMPLEMENTATION

Grade: 4 (adaptable for other elementary grade levels)

Media: Printmaking / mixed media / optional digital color

Suggested Time: 2-3 class periods, depending on class length and printing setup

Elements of Art & Principles of Design

Elements: Shape, Space, Color (extension).

Principles: Balance, Pattern, Rhythm, Unity.

Essential Questions

- How can one symmetrical design become a complete radial composition?
- How do repetition and rotation change the way we see a shape or pattern?
- How can positive and negative space work together to create unity?

Introduction / Engage

Show examples of bilateral and radial symmetry in art, nature, and everyday objects. Ask students what repeats, where the center is, and what appears to be mirrored. Introduce the terms bilateral symmetry, radial symmetry, pattern, positive space, and negative space. Show a finished Creative Symmetry example and invite students to predict how it was made.

Teacher Demonstration: Designing the Matrix

1. Give each student one sector template representing one-sixth of a circle. Point out the center line that divides the sector into two matching halves.
2. Demonstrate the mirror rule: when a shape is placed on one side of the center line, a matching shape is placed in the corresponding position on the other side.
3. Model how shape size, direction, spacing, and distance from the center can change the design.
4. Press all adhesive shapes firmly so the raised design is ready for inking.

STEP-BY-STEP: PRINTING THE RADIAL DESIGN

Prepare the Matrix for Printing

1. Once the adhesive shapes are complete, check the matrix carefully and make sure all pieces are firmly attached.
2. Create three small tape handles on the back of the matrix. These handles provide better control when positioning, pressing, and lifting the matrix.





Prepare the Ink

1. Place a small amount of black fabric printmaking ink on a smooth plastic surface.
2. Roll the brayer through the ink until a thin, even layer covers the roller.
3. Roll the ink evenly across the raised adhesive shapes on the matrix. Avoid over-inking, which can fill small spaces and reduce detail.

Practice Before the Final Print

1. Before working on the final composition, use a practice sheet with the sector shape traced on the paper.
2. Make several test impressions to experiment with:
    - the amount of ink,
    - even pressure,
    - accurate placement,
    - and the place–press–lift technique.
3. Adjust the amount of ink or pressure as needed before moving to the final paper.
4. Keep successful test impressions. These prints can also be used for an alternative assembly method: individual printed sectors can be cut out and arranged together to construct the complete radial design on a separate sheet.

Stamp and Rotate

1. Use the lightly pre-drawn circle and six sector divisions on the final paper as a placement guide.
2. Align the point of the matrix with the center of the circle and its edges with the pencil guidelines.
3. Hold the matrix by the tape handles, carefully lower it onto the paper, apply even pressure, and lift it straight up without sliding.
4. Re-ink the matrix as needed.
5. Move to the next pre-marked sector and repeat the process.
6. Continue the ink–place–press–lift–rotate sequence until six impressions complete the circle.

Refine the Print While the Ink Is Wet

Before the black ink dries, examine the completed print for small areas where the ink did not transfer completely.

1. Use a small flat or round brush and a small amount of the same black printmaking ink.
2. Carefully fill minor gaps or incomplete areas in the impression.

3. Follow the existing printed shapes and avoid over-correcting the natural texture of the print.
4. Once the necessary corrections are complete, set the artwork aside to dry and cure fully.





REFLECTION & OPTIONAL COLOR EXTENSIONS

Final Reveal and Reflection

Once all six impressions are visible, pause to examine the transformation from one repeated sector into a complete radial composition.

Ask students:

- Where do you see mirror symmetry in the matrix?
- Where do you see radial symmetry in the final print?
- Which shapes create the strongest pattern or rhythm?
- Where is the positive space? Where is the negative space?
- What surprised you when the six impressions came together?
- What would you change if you designed a second matrix?

Digital Color Extension — Kleki

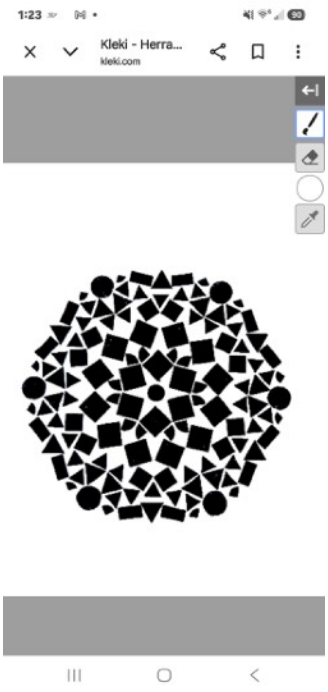
Students can photograph or scan the finished black-and-white print and import the image into Kleki, a browser-based digital painting program.

Using a small set of essential tools, participants can experiment with multiple color combinations while preserving the original physical print.

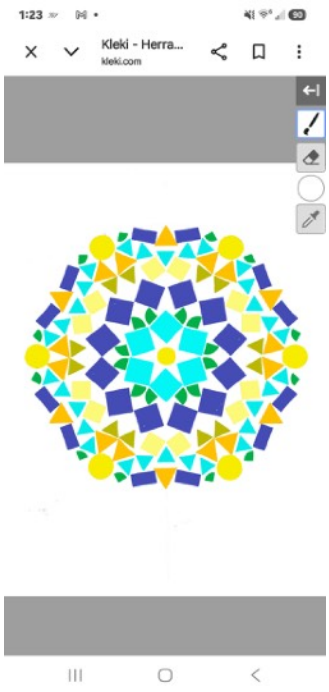
Essential Kleki tools for this activity:

- **Paint Bucket:** Quickly fills enclosed areas with color.
- **Brush:** Closes small gaps in printed outlines or separates adjacent areas when the Paint Bucket fills more than one intended shape.
- **Eyedropper / Color Picker:** Selects and reuses colors already present in the design.
- **Undo / Redo:** Allows participants to quickly correct a mistake.

Encourage participants to experiment with repeated color schemes, complementary colors, analogous colors, warm/cool combinations, or limited palettes. Digital coloring makes it possible to test several solutions before selecting a final color design.







Traditional Color Extension

For a traditional mixed-media version, allow the fabric printmaking ink to dry and cure completely according to the manufacturer's instructions before applying wet media over the printed surface.

Once fully cured:

1. Apply a thin, semi-transparent layer of white paint over the black printed design. The goal is to soften the black while keeping the underlying shapes and patterns visible.
2. Allow the white layer to dry completely.
3. Add color using colored pencils, markers, acrylic markers, or other selected drawing media.
4. Encourage deliberate color choices that reinforce repetition, pattern, emphasis, contrast, and unity.

Because the cured fabric ink is water-resistant, the white paint layer can be applied over the print without reactivating or smearing the original black design.



KEY VOCABULARY

Bilateral / Mirror Symmetry: A type of symmetry in which one side reflects the other across a central line.

Radial Symmetry: A balanced arrangement in which parts repeat around a central point.

Circular Sector: A portion of a circle bounded by two radii and an arc. In this project, each sector represents one-sixth (1/6) of the whole circle.

Matrix: The prepared surface used to transfer an image in printmaking. In this project, the sector with raised adhesive shapes is the matrix.

Impression: The image transferred from the inked matrix onto paper.

Positive Space: The areas occupied by the printed or designed shapes.

Negative Space: The open areas around and between the printed shapes.

Rotation: Turning a shape or object around a fixed point.

DIFFERENTIATION & STEAM CONNECTIONS

Differentiated Instruction

- Use finished examples and step-by-step visuals throughout the lesson.
- Model the mirror-placement and printing process slowly and repeat it as needed.
- Provide a pre-drawn circle divided into six sectors to support accurate placement and rotation.
- Offer a print-and-assemble option in which individual sector impressions can be cut out and arranged into the final radial composition.
- Challenge advanced students to construct and divide their own circle, create more complex mirrored designs, or develop a deliberate color system.

STEAM / Cross-Curricular Connections

- **Mathematics:** bilateral and radial symmetry, rotation, geometric shapes, spatial reasoning, and fractions. Students work with 1/6 of a circle and combine six equal sectors to create 6/6, or one whole.

- **Science:** observation and comparison of radial patterns in flowers, snowflakes, starfish, shells, fruit cross-sections, and other natural forms.
- **Engineering / Design Thinking:** planning a repeatable system, testing impressions, controlling placement, pressure, and ink, and refining the process.
- **Technology:** photographing or scanning the print and using Kleki to explore and compare digital color solutions.
- **Visual Arts:** printmaking, composition, shape, space, pattern, balance, unity, craftsmanship, and artistic decision-making.

ASSESSMENT & EVIDENCE OF STUDENT LEARNING

During the Process

Observe whether students can:

- Create mirror symmetry within the sector.
- Recognize the sector as 1/6 of the whole circle.
- Use the printing matrix with appropriate ink, pressure, placement, and rotation.
- Explain how repetition and rotation transform one sector into a complete radial design.

Final Artwork

The completed work should demonstrate:

- Mirror symmetry in the original matrix.
- Six repeated impressions forming a radial composition.
- Thoughtful use of shape, space, and pattern.
- Care and craftsmanship throughout the printing process.

Evidence of Learning

- Completed printing matrix
- Final radial print

- Optional traditional or digital color extension
- Student reflection and teacher observation

RESOURCES, MATERIALS & BUDGET

Item	Use	Supplier	Approx. Cost
White Tagboard, 18" × 24"	Final printing surface and practice sheets	Amazon – Pacon PAC5220, Pack of 100	1 × $36 = $36
Adhesive Foam Shapes	Creating the raised matrix design	Amazon – Horizon Group USA Assorted Self-Adhesive Foam Shapes	3 × $9 = $27
Black Fabric Block Printing Ink	Inking the printing matrix	Amazon – Speedball Fabric Block Printing Ink, 5 oz.	5 × $19 = $95
Soft Rubber Brayers, 4"	Applying ink evenly to the matrix	Amazon – Speedball Deluxe Soft Rubber Brayer, 6-Pack	2 × $110 = $220
Hand Wipes	Cleaning hands and work areas	Amazon – Wet Ones Sensitive Skin, Unscented, 40 ct., 6-Pack	1 × $18 = $18
Small Flat & Round Brushes	Touch-ups and print refinement	Amazon – DECYOOL, 60-Piece Brush Set	1 × $7.50 = $7.50
Tape	Creating handles on the back of the printing matrix	Amazon – JusArt Artist Tape for Watercolor Paper, 1 inch Wide 200FT Long	1 × $8 = $8

Teacher-Prepared Materials

- One-sixth circular-sector matrix template with center line
- Pre-drawn final printing guide with circle, center point, and six sectors

- Practice sheets with traced sector guides
- Finished sample artwork
- Step-by-step process photographs or slideshow
- Vocabulary and reflection prompts
- Kleki Quick Guide for digital color exploration

Additional Resources

- Document camera or projector, if available, for live demonstration

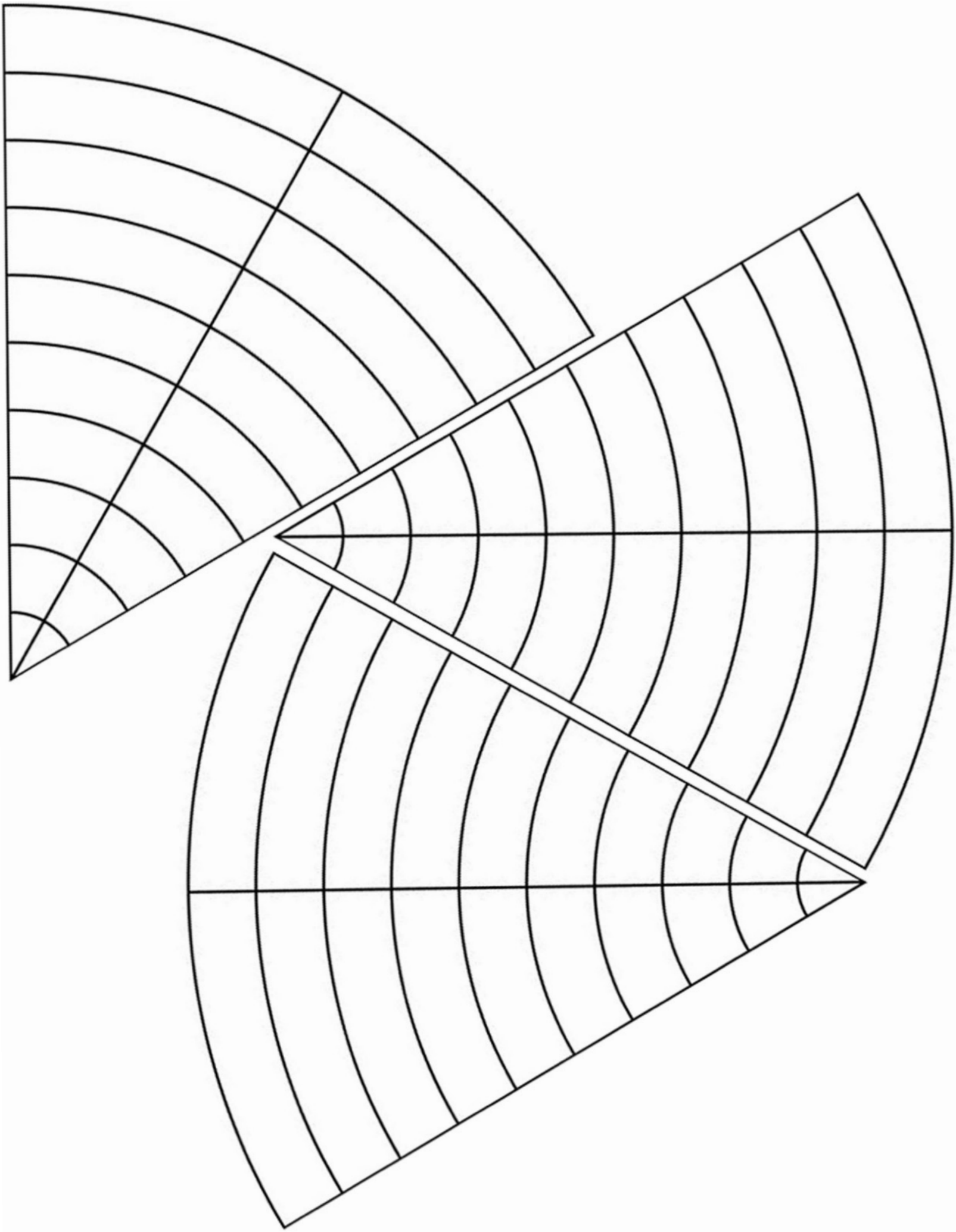
VISUAL / TECHNOLOGY RESOURCES

The following visual resources support the implementation of the project:

- Step-by-step process photographs or demonstration slides
- Printable sector and six-part circle templates
- Examples of bilateral and radial symmetry
- **Kleki Quick Guide** for digital color exploration

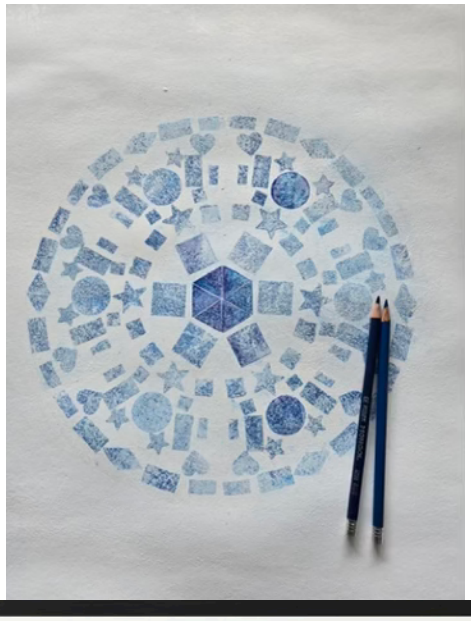
Technology Resource — Kleki

Kleki is a free browser-based painting tool used for the optional digital color extension. Students can photograph or scan their finished print and experiment with different color combinations using a few basic tools: **Paint Bucket, Brush, Eyedropper/Color Picker, and Undo/Redo**.

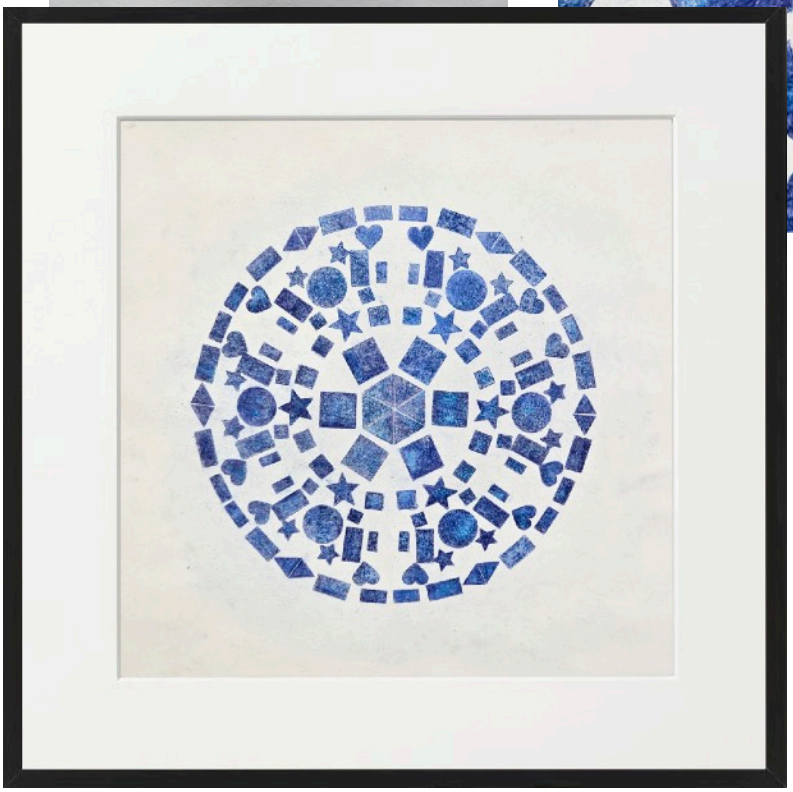


STUDENT WORK SAMPLES

The following student examples demonstrate different outcomes of the **Creative Symmetry** process. Although each design begins with the same one-sixth-sector structure, individual choices in shape, spacing, repetition, and color create unique final compositions.



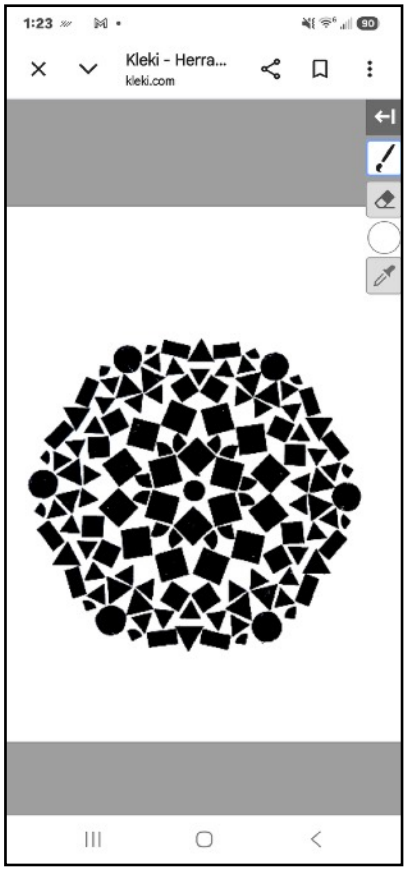











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