

Hex Designs Through Quilling

by Adrienne Tambone

I. Introduction: IPTS# 1,4 & 8

Lesson Topic and Teaching Context:

This lesson introduces students to radial symmetry and re-introduces students to the art of quilling. Fourth grade students will look at 18th century Colonial American Hex designs popular of the Pennsylvania Dutch while creating their own simple radial design. Their radial designs will then be filled in using the coil technique they learned in the previous lesson while continuing to apply the radial symmetry concept to their design.

DESIRED RESULTS: STAGE 1: IDENTIFY DESIRED RESULTS

II. Desired Results: [Stage 1: Identify Desired Results] IPTS# 1, 2, & 4

A. Overarching Understandings & Essential Questions IPTS# 1, 2 & 4

1. Overarching Understandings:

Radial symmetry creates balance.

2. Essential question(s)

What is radial symmetry?

How do Colonial hex designs show radial symmetry?

National Art Standards

VA.K-4.1 CONTENT STANDARD: Understanding and applying media, techniques, and processes

VA.K-4.2 CONTENT STANDARD: Using knowledge of structures and functions

VA.K-4.4 CONTENT STANDARD: Understanding the visual arts in relation to history and cultures

Common Core/ Illinois Art Standards

IL.25.A STANDARD: Understand the sensory elements, organizational principles and expressive qualities of t

IL.26.A STANDARD: Understand processes, traditional tools and modern technologies used in the arts.

IL.27.A STANDARD: Analyze how the arts function in history, society and everyday life.

Grade Level Performance Art Descriptors

IL.25.A.2d > Visual Arts: Identify and describe the elements of 2- and 3-dimensional space, figure ground, va

IL.26.A.2f > Visual Arts: Understand the artistic processes of printmaking, weaving, photography and sculpt

IL.27.A.2a > Identify and describe the relationship between the arts and various environments (e.g., home, :

C. Knowledge/Skills

C. Knowledge and Skills IPTS# 1, 2 & 4

Students will know (knowledge):

1. Radial symmetry occurs when identical patterns radiate out from the center of an image.
2. Colonial hex designs are a form of radial symmetry.
3. Hex designs have six sections.

Students will be able to (define by audience, behavior, conditions):

1. Create a simple hex design.
2. Apply various coil shapes to the hex design.

ASSESSMENT TASKS: STAGE 2: DETERMINE ACCEPTABLE EVIDENCE

III. Assessment Tasks: [Stage 2: Determine Acceptable Evidence] IPTS #8

A. Pre-requisite/prior knowledge

Students have discussed reflection symmetry in a previous class and many students were introduced to radial symmetry when they were third graders. Furthermore, they learned various quilling techniques in the previous lesson, including how to create six coil shapes.

DAY 1:

During the anticipatory set, students will be asked to identify what type of symmetry they can identify

in the kaleidoscopes. During the demonstration, students will be asked about prior knowledge to reflection symmetry and whether they can identify radial symmetry in the hex designs being shown in the presentation. They will also be asked about their knowledge of hex designs and why they were used during with the Pennsylvania Dutch settlers.

DAY 2:

During the anticipatory set, students will be asked to identify which images belong in the reflection symmetry group and in which should be placed in the radial symmetry group. Students will look at two finished hex designs. Furthermore, students will be asked about their prior knowledge of three-dimensional forms in relation to quilling and which six shapes they created in their worksheet from a previous class.

B. [Formative Assessment](#):

DAY 1: During the hook, students will be asked to recall which type of symmetry the kaleidoscope creates after the teacher has explained. During the demonstration, the teacher is continuously checking their knowledge about what has been addressed in the demonstration by asking questions regarding the definition of radial symmetry and where it can be found in nature, technology and in the classroom. Students will be asked to recall why hex designs were used during Colonial America and what hex represents in terms of radial symmetry. Throughout the entire lesson, the teacher is asking questions to check for student understanding of radial symmetry.

DAY 2: Students will be asked to recall if quilling is a three-dimensional art form. They will be asked to explain how many coils must be used on the finished product. The assessment will also occur as I move around the room. Throughout the entire lesson, the teacher is asking questions to check for student understand of radial symmetry in regards to quilling.

DAY 3: Since day three is mostly a work day, the assessment will occur as I move around the room making sure students are creating their designs with radial symmetry.

B. [Summative Assessment \(if appropriate\)](#):

A summative assessment is used in the graded rubric created for the students. This rubric checks the students final product for creating a radial design and applying coil shapes properly to keep the radial design consistent. They must use at least two different coil shapes when applying the coils. Students will also be assessed on the craftsmanship of their product that includes the use of glue and overall care involved.

TEACHING AND LEARNING: STAGE 3: PLAN LEARNING EXPERIENCES

IV. Teaching and Learning Plans [Stage 3: Plan Learning Experiences]

A. Time required for lesson segments and grouping arrangements are specified [**SUPERVISORS WILL RESPOND TO THIS SECTION BASED ON INFORMATION THROUGHOUT THE LESSON WHERE 'Anticipated Time ' IS LISTED]**

B. Grouping Arrangements IPTS# 4,5&6

Whole class

Cooperative groups

Pairs _____

Small group(s) _____

C. Materials and Technology (list) IPTS# 4&5 (TL. 1)

[Materials and technology listed are appropriate for the lesson content and used in the lesson, list all resources].

1. **Materials**

?DAY 1

- pre-drawn circle and divided into 6 sections on colored paper
- pencils
- various stencil shapes for tracing
- Kaleidoscopes
- PowerPoint on history of Hex designs, and various examples of radial symmetry

DAY 2:

- color strips of paper
- toothpicks
- q-tips
- glue
- images of radial and reflection symmetry

DAY 3:

- color strips of paper
- toothpicks
- q-tips
- glue

1. **Technology**

- ?Laptop
- Elmo
- Projector

D. Teacher's preparation IPTS# 1,2,4 & 5 (TL. 2.)

Assemble Materials:

For the second and third day, have students' quilling reference worksheet available and graded.

Practice Procedures:

Make pre-drawn circles and divisions on colored paper.

Create various shape stencils for tracing including a small circle and petal shape.

Create PowerPoint on hex history that includes various images of radial design.

For day one, create two finished versions of the hex designs in pencil. One design will be considered acceptable because it follows the rules of radial symmetry. The other version will be considered not acceptable because it does not show radial symmetry.

Create a final product of the quilled hex design.

Prepare vocabulary cards with pictographs to be used in the lesson and then attached to the word wall.

Write SWBAT on white board. (Students will be able to identify and create radial designs. Also, students will be able to apply various coils to their radial design.)

Identify New Vocabulary:

Add new vocabulary accompanied with a pictograph to word wall. New vocabulary includes: radial symmetry and hex design

Organize Workstations:

DAY 1:

1. Each table will have enough pre-drawn circle paper for the group.
2. Each table will have an assortment of stencils.
3. Each table will have pencils.

DAY 2 and DAY 3:

1. Each table will have pre-cut strips of colored paper ready for quilling.
2. Each table will have two cups of glue with q-tips.
3. Each table will have toothpicks and pencils.

E. Set/Hook IPTS# 2, 3, 4, 5, & 6 (T.L. 3)

DAY 1:

I will pass out kaleidoscopes to each pair of students. They will take a few moments to look through the kaleidoscope and describe what they see. After they have discussed with their partner about their observation, I will have a few share their observation with the class. After which, I will prompt them with a question: Do you see symmetry in the designs you are looking at? And if so, what types of symmetry do you see? We will have a brief discussion on these questions. I explain that the kaleidoscope shows radial symmetry and let them observe one more time.

Anticipated Time: 5 minutes

DAY 2:

Review of radial symmetry: In groups, students will be given a set of images. I will ask them to organize the images into two sets: reflection symmetry and radial symmetry. A few students will share how they grouped their sets and why.

Anticipated Time: 5 minutes

DAY 3:

Students will spend a few minutes in an open conversation about their quilling process so far with radial design.

Anticipated Time: 5 minutes

F. Differentiated or individualized learning -IPTS# 2, 3 & 4(i.e. non-reader, ELL-levels, gifted) (TL. 4)

For an ELL student I will create a directions sheet into Spanish. Furthermore, I will have a finished visual for the student to use as a reference.

Project will be modified for special education students based on recommendations in their IEPs. Some modifications might include further scaffolding with written directions and images. Also, students who have difficulty with fine-motor skills can use pipe cleaners instead of strips of paper to create their coils, which are easier to handle.

G.Plans for teacher input in the form of explanations and modeling IPTS# 1, 2, 3, 4, 5, 6 & 7

DAY 1:

I point to the SWBAT (Students will be able to -) on the white board. I call on a student to read what they will be able to do today. Student: "Students will be able to identify and create a simple radial

design." I then repeat the SWBAT to the entire class one more time.

A PowerPoint presentation is being used to show visual examples of radial design and hex design.

The kaleidoscopes we just looked at create radial symmetry. Can someone tell me what radial symmetry is? Expected Response: "I don't know." Radial symmetry is where something goes around a central point or a circle and stays the same. For example, a snowflake has radial symmetry (I show them an example of a snowflake). Can someone think of another object in nature or that is manmade where radial symmetry occurs? Expected Response: "A flower." That is correct. The petals of a flower create symmetry around the center point (pointing to a sunflower). How about we take a moment and see if we can find any other examples of radial symmetry in our classroom. (I will allow a few students to share what they found. Next, I show them an example of a butterfly.) Does this butterfly have radial symmetry? Expected Response: "No." That is correct. The butterfly has reflection symmetry. If we placed a point in the center of the butterfly, and we go around in a circle, you will see that not all the parts are the same. However, radial symmetry does occur in nature and can be found in many traditional art forms.

Today we will be looking at Hex Designs. (Showing them an example). Does this hex design create radial symmetry? Expected Response: "Yes." The design repeats around and around the circle. Have any of you seen these Hex Designs before? The Pennsylvania Dutch farmers first created these Radial Hex Designs in the 18th century, around the same time quilling became a popular hobby. Does anyone know why the farmers created Hex designs? They created **Hex Designs** for good luck and hung them on the outside of their barns. The word "Hex" means bad luck or a curse. When farmers hung "Hex Designs" they were trying to protect their farms from curses. In art or math, the word "Hex" means "six". Like a six sided hexagon shape. Many Hex Designs have six sections.

Today we are going to make our own hex design and in the coming days, coloring them in using the quilling technique we had practiced in the previous class. Could I have everyone please stand around the demonstration desk? I will show you how to design your own hex design.

To make it easier, I have already traced the circle and divided it for you into six parts. Please cut your circle out. (Holding up the circle). What does this look like? Expected Response: "A pizza pie." Yes. It looks like a pizza with six slices. With the various shaped stencils I made for you, you will begin designing your Hex design. Whatever we do in one pie slice, we must do in the next pie slice. Why do we want to repeat the same design in each section? Expected Response: "To create radial symmetry." That is correct. In order for us to create radial symmetry we must repeat our design in each section. I want to keep my design simple because later this will be filled in with coils, and the more difficult your design, the more difficult it will be to quill. I am going to use the diamond shape stencil and trace it in one section using a pencil. What do I do next? Expected Response: "Repeat the tracing process in all six sections." That is correct. Next, I want to add one more element to my pie slice. I will use the circle stencil and create two circles on both sides of my diamond tip. I must repeat this step again for the other sections. I have now completed a hex design. (Holding it up.) Does this look like radial symmetry? Do you have any questions about the tracing process?

I would like you to make at least two different radial hex designs. I will be leaving some examples of hex designs on the board for inspiration. Furthermore, you do not need to use the stencils I have made for you. You are welcome to create your own shapes and designs. But, whatever you put in one section, you must do for all sections of the circle. Any more questions? Please have one person from your table come to the front to retrieve the paper, pencils, and scissors.

Anticipated Time: 7-9 minutes

DAY 2:

I point to the SWBAT (Students will be able to -) on the white board. I call on a student to read what they will be able to do today. Student: "Students will be able to create a hex design using the process of quilling." I then repeat the SWBAT to the entire class one more time.

Last class we designed our hex designs with pencil. Instead of painting or coloring the design in, we are going to use the quilling method to give our design some color. What will happen to our two-dimensional design? Will it stay two-dimensional? Expected Response: "No." That's correct. Our two dimensional design will become three-dimensional once we add the coils. (I hold up an unfinished hex design and a finished hex design with quilling to show them the difference). If you could please gather around the demonstration table, I will show you how to apply the coils to your hex design.

From the two designs you created last class, please choose one. I chose the more simple hex design because it will be easier to add coils and I don't need to be as detailed. I did a little mental planning and decided to use the colors orange, purple, white and blue. For this project, you must use at least two different types of coil shapes. How many coil shapes must you use? Expected Response: "At least two." That is correct. What I suggest is you start to make a few coils first before gluing them down to your design. Once you have made a few coils, you will glue them down in the area of your choice. As I'm gluing this down, I am making sure that they are staying within the line where I created a shape with my pencil. It's almost like coloring, but instead you are using coils. I decided to use the eye shape for the outside of my designs because of its straight edge quality. I filled in the middle of the diamond shapes with the closed coil. You are welcome to use more than two types of coil shapes, just remember to be careful about your color placement in each section. I do not want to see random colors placed scattered on your hex design. If you look at the examples on the board, you will see that the colors are uniform in each section or every other section. Please be aware of this when you begin coiling. I suggest filling in the larger shapes you created in your design first, starting from the center of the circle and working your way out like this (showing an example of a partially done design). Does anyone have any questions?

I will hand out your two hex designs you made last class. Please choose the design you like most and begin filling in the design with coils. All materials are located on your group's table. Remember, I suggest making the coils first and then gluing them down.

Anticipated Time: 7-9 minutes

DAY 3:

Today we will continue to quill our hex designs, but before we continue, I would like to show you one way we can use the shaped coil to add more detail to the hex designs. If you look here (at examples of hex designs), some have small shapes on the outer area of the circle like a flower or simple circle shape. We can use our quills to create that. Currently, I have filled in my diamond shapes and I have six semi-triangular areas to fill in with another color. Instead of filling in these spaces with just one color, I could add a small additional design to add more detail to the hex design. What might be a fun coil shape to add there? (I call on someone) Response: "Teardrop coil." That sounds like a great idea. Okay, so first I will choose a color strip. Let's use blue. I have now created my teardrop shape and will place it in the middle of the triangular area. Now that I have done that, I can fill in the rest of the area with a different color. Let me show you. (I use regular coils to fill in the rest of the area). Do you see how the teardrop shape pops out? This is another way to add some detail to your hex design. Remember to be consistent with color. Do you have any questions? Okay, please take out your hex designs and continue to work.

Anticipated Time: 5 minutes

H. Plans for Guided Student Practice (teacher coaching) [IPTS# 4 5, 6& 7]

1. After the demonstration of each day, the teacher will be walking around the room assessing students as they create their hex design and gluing of coils.
2. I will be looking to make sure students are creating radial symmetry while they create their hex designs, reminding them that color placement is important.
3. If the teacher sees many students struggling at one time, the teacher will call attention to the class and re-explain the process or technique.
4. During the coil process, I will be looking to see if students are winding the coil around the toothpick correctly and placing the strips directly on top of the other. If I see students have trouble with this, I will remind the students to do this.
5. I will be sure to give reminders to those students who are not following directions and have them look at the finished hex design in pencil and quilled form for reference.
6. I will call attention to students in the last 5 minutes of class. Students will be asked to clean up.

Anticipated Time: 150 minutes (about three periods)

I. Plans for Creative Interpretation ([other creative solutions accepted in this lesson](#)) IPTS# 1*

Students may hand draw their hex designs instead of using the provided stencils. Students may also create their own coil shapes that were not created for the worksheet if they feel comfortable doing so.

J. Plans for Independent Student Practice [IPTS# 1 & 2]

DAY 1: Students will be encouraged to look at more hex designs at home on the internet.

DAY 2 and DAY 3: Students will be encouraged to make coils at home using the pre-cut strips of paper from class.

K. Closure (brief teacher or student-led review) IPTS# 1,5 & 8 (TL.5)

DAY 1: I will ask the students what they learned about hex designs and why they were used on barns. I will ask them how they felt about the designing process if they liked it or not.

DAY 2: The lesson will close with a brief discussion about the correlation between hex designs and quilling. Were they ever used together? Maybe they can research more on the topic at home.

DAY 3: A brief discussion about whether or not they would try quilling again. What did they struggle with? What did they enjoy about the quilling process?