

Comparing the Quilts of Indigenous Plains People with the Tessellations of M.C. Escher, Part 2

Escher's Terrific Tessellations: The Art of Tile Transformations

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Grade Level	9th – 12th Grade	**Time Frame**	120 - 180 minutes
Subject	Visual Arts	**Duration**	2-3 class periods
Course	Visual Arts		

Essential Question

How can an artist use the principles of design to create effective art? How can the principles of design help an artist convey mood and meaning?

Summary

In this follow-up lesson to "Diamonds, Not Just a Girl's Best Friend," students explore an app that creates Escher-like drawings. Students discuss the principles of design in the drawings. Students discuss Escher and then discuss similarities of the Plains tribes art that precede Escher. Students reflect on the idea of multiple discovery and discuss why the Plains tribes and Escher arrived at similar ideas with different implementations. This is the second lesson of the "Comparing the Quilts of Indigenous Plains People with the Tessellations of M.C. Escher" lesson duo.

Snapshot

Engage

Students start the lesson with the instructional strategy Tell Me Everything and share everything they know about tessellations.

Explore

Students spend a few minutes with Escher Sketch, a website that allows them to quickly immerse themselves in the art of M.C. Escher. Once they have had some time with the website, they share their initial thoughts using the Say Something! strategy.

Explain

Students watch a video that describes who M.C. Escher is, his artwork, and the connection it has to tessellations. After the video, students create their own tessellation.

Extend

Students explain how M.C. Escher applies the principles of design to his tessellations.

Evaluate

Students come back together as a class and use the Venn Diagram strategy to compare and contrast the work in the star quilts and the tessellations of M.C. Escher.

Standards

Oklahoma Academic Standards (Fine Arts: Visual Art (High School: Advanced (II)))

CP: Creative Process (CP)
II.VA.CP.1.2 : Choose from a range of materials and methods of traditional and contemporary artistic practices to plan personal works of art and design.
CHP: Cultural and Historical Perspectives (CHP)
VA.CHP.1 : Relate artistic ideas and works with societal, cultural and historical context to deepen understanding.
II.VA.CHP.1.1 : Analyze works of art in a variety of societal, cultural, and historical contexts and make connections to uses of art in contemporary and local contexts.

Attachments

- Create a Tessellation—Escher's Terrific Tessellations - Spanish.docx
- Create a Tessellation—Escher's Terrific Tessellations - Spanish.pdf
- Create a Tessellation—Escher's Terrific Tessellations.docx
- Create a Tessellation—Escher's Terrific Tessellations.pdf
- Four Corners Posters—Escher's Terrific Transformations - Spanish.docx
- Four Corners Posters—Escher's Terrific Transformations - Spanish.pdf
- Four Corners Posters—Escher's Terrific Transformations.docx
- Four Corners Posters—Escher's Terrific Transformations.pdf
- Lesson Slides—Escher's Terrific Tessellations.pptx
- Say Something—Escher's Terrific Tessellations - Spanish.docx
- Say Something—Escher's Terrific Tessellations - Spanish.pdf
- Say Something—Escher's Terrific Tessellations.docx
- Say Something—Escher's Terrific Tessellations.pdf
- Venn Diagram—Escher's Terrific Tessellations - Spanish.docx
- Venn Diagram—Escher's Terrific Tessellations - Spanish.pdf
- Venn Diagram—Escher's Terrific Tessellations.docx
- Venn Diagram—Escher's Terrific Tessellations.pdf

Materials

- Lesson Slides (attached)
- Say Something! handout (attached; one per student)
- Principles of Design handout (linked; one per student)
- Create a Tessellation handout (attached; one per student)
- Four Corners Poster handout (optional; attached; class set)
- Venn Diagram handout (attached; one per student)
- Copy paper
- Sticky notes
- Scissors
- Cellophane tape
- Colored medium such as pastels, paint, markers
- Blank canvas or heavy paper for artwork
- Projector
- Touchscreen device like phone/tablet or Chromebook/laptop for each student

20 minutes

Engage

Introduce the lesson using the attached **Lesson Slides**. Display **slide 2** and let them know that this lesson is an extension of the first lesson Diamonds, Not Just A Girl's Best Friend, in which you covered quilt making of Indigenous Plains People.

Move to **slide 3** and share the instructional strategy Tell Me Everything with your students. Prompt them to write down everything they know about tessellations. Provide them with one minute. Once your students are finished with writing down everything they know, move to **slide 4** and have them share their list with a partner. Instruct them to record any new information their partner may share that they don't already have written down. Once your students have had enough time to share with one another, have groups share list items with the rest of the class. Write down these responses to construct a whole-class list (students may add these new items to their personal lists as well). As the list grows, make sure groups only share items that are not already on the class list. Use this opportunity to address misconceptions and gaps in knowledge.

Display **slides 5-6** to share the essential questions and learning objectives for the lesson.

20 minutes

Explore

Display **slide 7** and instruct your students to scan the QR code with their phones or tablets to navigate to the Escher Sketch website. Once all of the students have navigated to the website, start the four (4) minute timer.

Teacher's Note: Activity Timing

If you would like your students to spend more, or less, time, you can find additional timers on the K20 YouTube Channel.

Move to **slide 8** and share the instructional strategy Say Something! with your students. Pass out the attached **Say Something** handout. This strategy is typically paired with a reading, however the sentence frames provided with this strategy will help students effectively express their ideas, ask questions, and support their claims with evidence about the Escher Sketch website. Instruct your students to write down two statements using the provided sentence frames regarding their initial thoughts on the website. Have your students share their observations with a partner and encourage some to share with the whole class.

50 minutes

Explain

Display **slide 9** and share a definition of multiple discovery with your students. Ask them if there are any examples of this that they can think of. **Slides 10-14** provide a couple of examples you can share with your students such as:

- 1600s: Isaac Newton and Gottfried Leibniz's simultaneously discover calculus.
- 1800s: Charles Darwin and Alfred Russel Wallace both describe natural selection.
- 1950s: Jonas Salk and Albert Bruce Sabin both invent the polio vaccine.
- 2015: Takaaki Kajita and Arthur B. McDonald's simultaneously discover neutrinos.

Using **slides 15-16,** share the background of M.C. Escher with students. Play the video The Mathematical Art of M.C. Escher.

Embedded video
https://youtube.com/watch?v=Kcc56fRtrKU

Following the video, display **slide 17** and share the definition of a tessellation with your students. Next pass out the attached **Create a Tessellation** handout and play the video Escher's Terrific Tessellations: The Art of Tile Transformations on **slide 18**.

Embedded video
https://youtube.com/watch?v=mnsHvHgSpE8

Move to **slide 19** and provide your students with enough time to create their own tessellations using the directions on the handout.

20 minutes

Extend

Display **slide 20** and explain the Collective Brain Dump instructional strategy. Ask students to share singular words that would describe their tessellation projects and list them on a whiteboard.

Teacher's Note: Mentimeter

Consider using a tech tool such as Mentimeter to create a word cloud from the collective brain dump. In this tech tool, as students input their words, the words students most commonly use will get bigger. This can help to focus the class discussion that follows.

Move to **slide 21** and share the principles of design. Ask your students to consider the words they just used to describe their work. Do any of the principles match what they were describing? Ask students the following:

"Thinking back to the first activity, did you see those same principles there?"

Use **slides 22-29** to remind students of the principles of design and accompanying details. If students would like a paper reminder, use the linked Principles of Design handout. Once you've reviewed this information (if necessary) as a class, pass out one sticky note to each student, and ask students to select the principle that best matches their tessellation design and write it down on their sticky note.

Display **slide 30** and explain the Sticky Bars instructional strategy to your students. Have them place their answers on the wall using the strategy. Based on their responses, group students together to summarize why they think their principle of design is most applicable to the activity. The slide has a three minute timer, but again, feel free to select a longer or shorter timer if you feel your students would benefit from an alternate timer. When the timer ends, have each group share their response. After the students have shared their responses, ask if any students have changed their mind. If they have, allow them to join the group that persuaded them. Explain to students that while arguments can be made for many of the design principles, with an especially strong case for repetition, the lesson today is focused on pattern.

Teacher's Note: Possible Student Responses

There will likely be students who answer balance, pattern, repetition, and rhythm during the first discussion.

Teacher's Note: Alternative Activity

The activity in the previous paragraph is very similar to K20's Four Corners instructional strategy. To use this strategy, print the attached **Four Corners Posters** and hang them around the room. This can help facilitate a smoother transition to groups. This is useful for younger students, but for older students it might be an unnecessary extra step.

20 minutes

Evaluate

Display **slides 31-32**. Share the instructional strategy Venn Diagram and pass out the attached **Venn Diagram** handout. Have your students compare the activities from the two lessons, comparing the quilt patterning from the Plains tribes with the tessellations of M.C. Esher.

Resources

- BBC. 5imon5. (2009, May 27). *The Mathematical Art Of M.C. Escher* [Video file]. https://www.youtube.com/watch?v=Kcc56fRtrKU&t=238s
- *Eschersketch*. EscherSketch. (n.d.). https://eschersket.ch/
- K20 Center. (n.d.). Tell me everything. Strategies. https://learn.k20center.ou.edu/strategy/107
- K20 Center. (n.d.). Collective brain dump. Strategies. https://learn.k20center.ou.edu/strategy/111
- K20 Center. (n.d.). Four corners. Strategies. https://learn.k20center.ou.edu/strategy/138
- K20 Center. (n.d.). Mentimeter. Tech Tool. https://learn.k20center.ou.edu/tech-tool/645
- K20 Center. (n.d.). Sticky bars. Strategies. https://learn.k20center.ou.edu/strategy/129
- K20 Center. (n.d.). Venn diagram. Strategies. https://learn.k20center.ou.edu/strategy/2918?rev=23779
- K20 Center. (2023, July 10). *Escher's Terrific Tessellations: The Art of Tile Transformations* [Video file]. https://www.youtube.com/watch?v=mnsHvHgSpE8
- Simoes, P. R. (2017). *The Artist -Maurits Cornelelius Escher- working at his Atelier*. Wikimedia Commons. https://commons.wikimedia.org/wiki/File:The_Artist_-Maurits_Cornelelius_Escher-_working_at_his_Atelier_%2850385403156%29.jpg
- The. J. Paul Getty Museum. (2011). Principles of Design. J. Paul Getty Trust. https://www.getty.edu/education/teachers/building_lessons/formal_analysis2.html