



GRADES: 6-8

TEXTILE TESSELLATIONS

Analyzing and creating pattern and repetition relationships in textile design

SUPPLIES

- Paper
- Pencil
- Scissors
- Speedball Bench Hook/Inking Plate
- Speedball Block Printing Fabric Ink
- Speedball Speedy-Carve™ Block
- Speedball Linoleum Cutter Assortment Tool with Cutters
- Speedball Soft-Rubber Brayer
- Tracing Paper
- Iron or solvent for transfer
- Newsprint

LESSON

Students explore the relationship between positive and negative space, foreground and background by observing tessellations in their environment and in textiles. After exploring the mathematics of tessellation, students will create a personal tessellation and transfer their tiled image to a Speedball Speedy-Carve plate for reproducing the image on textiles. Students will compose a brief artist statement explaining their artistic choices using key vocabulary.

GUIDING QUESTIONS FOR LEARNING:

- How are geometric shapes/patterns used in art, particularly textile design?
- How can you manipulate geometric shapes into objects that will tessellate?
- Why do mathematicians, scientist and artists seek to understand the relationship of patterns?
- Why is craftsmanship important in art?

LEARNING TARGETS:

- The learner will have an understanding of negative/positive space.
- The learner will have an understanding of foreground and background.
- The learner will be able to identify tessellation/tiling patterns found in various art forms.
- The learner will construct a tessellation and use it to create a pattern with no empty spaces.
- The learner will identify the tools and the process necessary for block printing on textiles.
- The learner will produce multiples through the textile printing process.

COMMON CORE MATH STANDARDS FOR MIDDLE SCHOOL

CCSS.MATH.CONTENT.6.G.A.1

CCSS.MATH.CONTENT.6.G.A.3

CCSS.MATH.CONTENT.7.G.A.1

CCSS.MATH.CONTENT.7.G.A.2

CCSS.MATH.CONTENT.7.G.B.6

CCSS.MATH.CONTENT.HSG.MG.A.3

COMMON CORE ENGLISH LANGUAGE ARTS STANDARDS FOR MIDDLE SCHOOL

CCSS.ELA-LITERACY.W.6.2

CCSS.ELA-LITERACY.W.6.2.D

CCSS.ELA-LITERACY.W.6.7

CCSS.ELA-LITERACY.W.7.2.A

CCSS.ELA-LITERACY.W.7.2.D

CCSS.ELA-LITERACY.W.8.2

CCSS.ELA-LITERACY.W.8.2.D

NATIONAL VISUAL ART STANDARDS FOR MIDDLE SCHOOL

VA:Re.7.1.6a VA:Re7.2.7a VA:Re8.1.8a

VA:Re.7.1.7a VA:Re7.2.8a VA:Cn10.1.6a

VA:Re.7.1.8a VA:Re8.1.6a VA:Cn10.1.7a

VA:Re7.2.6a VA:Re8.1.7a VA:Cn10.1.8a



VOCABULARY

Tessellation

Printmaking

Negative

Geometric

Tiling

Opposite

Overlap

Interlocking

Polygon

Positive

Symmetry

Rotation

Textile

Brayer

Visual Art/Printmaking Process

SESSION 1

Students will be introduced to the concept of tessellations with images from nature, textile design, and artist M.C. Escher with an emphasis on the concepts of repetition, pattern, balance and symmetry.

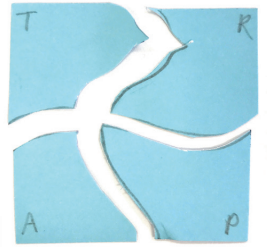
What are the characteristics of a pattern? A pattern is a combination of design elements or shapes repeated in a recurring and regular arrangement.

How do we define a tessellation? A tessellation is an arrangement of shapes, especially polygons, closely fitted together in a repeated pattern without gaps or overlapping.

What other forms of art include elements of symmetry, balance, repetition?

Where can we find evidence of patterns in nature?

Students will collaborate to produce a list of items in their environment that represent repetition, symmetry and tessellations and will present their findings to the class.



SESSION 2

Students will create a paper tessellation tile. Refer to resources for instructions.

Students will enhance their tessellation with positive/negative detail creating a representational or abstract image within the tile.

Students will integrate their tessellated tiles into a composition on paper.



SESSION 3 AND 4

Students will transfer their polygon tessellation to the Speedy-Carve block. The interior of the tiles must include line work to create additional negative/positive space.

If photo-editing software is available, students might consider inverting their image.

Transfer Rubbing Technique:

Center your drawn, traced or fresh (still wet) ink-jet printed, image facedown, directly onto the Speedy-Carve Block. Rub the back of the image with the back of your fingernail or spoon. When you lift away the paper, the image will be in place ready to carve.

Iron-on and Solvent Technique:

Laser and photocopied images may be transferred with the heat of an iron or with acetone.

- Provide each student with a small Speedy-Carve block to practice carving before carving their larger block.
 - Students will carve their Speedy-Carve block. (The Speedball Bench Hook is an excellent device for stabilizing the block while carving.)
 - The polygon shape tile must include interior negative space.
1. Hold the carving tool low, as parallel as possible to the block, so that you can make shallow horizontal cuts. Using the very lowest part of the tip only will ensure a narrow line; as you plow deeper the carved line will widen. Keep both edges of the V-blade above the surface of the block.
 2. When following the curves of your design, it's easier to rotate the block than to twist the carving tool about. Try placing a small piece of paper under the image to make rotating easier.
 3. Carved-away areas will not print; the raised portion is what will become the image.
 4. Using a craft knife, cut around the perimeter of the stamp, cutting through the V-trough border; or carve down (lower) all areas you do not want to print as part of your design.



SESSION 5

Students will print on fabric by inking and printing their block to create their tessellated textile composition. A fabric with a smooth surface rather than a rough texture will produce the cleanest most detailed prints.

1. Determine in advance where the tessellations will print on the fabric
2. Use the Speedball Fabric Printing Ink and a Speedball Rubber Brayer to roll a small amount of ink out onto a plate until it becomes the texture of orange peel. The Speedball Bench Hook can also be used as the ideal inking plate.
3. Roll the inked brayer onto the surface of the block making sure to cover all surface areas.
4. Test the printing process on a scrap of fabric or paper before printing the larger piece of fabric.



5. After placing a sheet of newsprint under the fabric (or between the layers if printing on a shirt or bag) place the inked block on the designated space to be printed and apply pressure to the back of the block with the Speedball Baren. It is helpful to put a sheet of newsprint on top of the block to provide a slick rubbing surface for the baren (without lifting the entire block, you may carefully check to see if the ink is transferring and requires more pressure).
6. Or place the fabric over the inked block and use the Speedball Baren to transfer the image to the fabric. You can often see the image appearing from the back of the fabric
7. Allow ink to dry. Speedball's Fabric Block Printing ink does not require any heat setting!! The ink will cure at room temperature in 5-7 days.



SESSION 6

Students will create an artist statement describing their process and artistic decisions using key vocabulary.

Clean-Up

Clean up is an essential component of craftsmanship and critical for maintaining tools.

1. Remove any excess ink from block with newsprint or scrap paper.
2. Discharge excess ink on brayer by rolling on newsprint or scrap paper to discharge the ink.
3. After the excess ink is removed, use a baby wipe or paper towel sprayed with soapy water to clean the brayer and the block.
4. Store brayer roller side up and resting on its frame to avoid flattening the rubber cylinder.

TEACHING RESOURCES:

- <http://www.tessellations.org/methods-diy-papercut.shtml>
- M.C. Escher
<http://www.mcescher.com/gallery/symmetry/>
- Tessellations in Islamic Art:
<http://peopleof.oureverydaylife.com/tessellations-islamic-art-2800.html>
- Tessellations all around us:
<http://www.tessellations.org/tessellations-all-around-us.shtml>