

LA BREA TAR PITS & MUSEUM



Ice Age Tessellations

3rd - 8th Grade

DURATION

Pre-visit: 20-40 mins

Visit: 20 mins

Post-visit: 1 hour

SUPPLIES

- Paper or post-it notes
- Pencils
- Scissors
- Coloring supplies (optional)
- Clipboards (optional for museum visit)

STANDARDS

CA Visual Arts

CR1, CR.2, CR.3, PR4, PR5

CCSS Math Practices

Practice 5, 7

CCSS Math Content

Grades 3-8 Geometry

VOCABULARY

- Tessellation
- Regular polygon
- Translation
- Rotation
- Symmetry

Overview

Students will learn what tessellations are and take inspiration from the Tar Pits to create their own tessellations. This tessellation activity can be modified for many grade levels. Please see the variations & extensions on page 3.

Concepts

- Tessellations are a pattern of plane figures that fill the plane with no overlaps or gaps.
- Math can be found in nature, art, and the built environment.
- The area of an irregular shape can be found if it can be decomposed into or cut and rearranged into regular polygons.

Objectives

- Students will know what tessellations are and be able to identify them.
- Students will look for examples of tessellations in nature.
- Students will create a tessellation pattern and use it in an art project.
- Students will calculate the area and perimeter of their tessellations.

Outline

1. Before visiting the Museum, introduce or review what a tessellation is.
2. While exploring the Museum, students will make sketches of animals they might want to depict in their tessellations.
3. Back in the classroom (or as homework), students will create their tessellations.
4. Optional: Create a classroom gallery to display students' tessellation projects.

Pre-Visit

Before visiting the Museum, introduce or review what tessellations are. Show a variety of examples from nature, the built environment, and art. Possible examples include a chess board, brick walls, tiled ceilings or mosaics, a turtle shell, honeycomb, and snake skin. Ensure you utilize examples of both simple (e.g. a single regular polygon repeated) and more complex tessellations (e.g. two or more shapes, shapes other than regular polygons). Look at examples of art from M.C. Escher.

Ask your students if they can think of any other examples of tessellations. Ask them if they can think of examples of shapes that cannot tessellate.

If you have time, you may want to have students practice drawing a tessellation with simple polygons. You can also introduce different methods of creating tessellations and have students create a small project before going to the Museum. Resources with instructions and pictures:

[STEM Activities for Kids](#)

[Math Engaged](#) (includes 3 methods)

Tell students that when they go to the Museum, they will be looking for inspiration to create an Ice Age themed tessellation.

Museum Visit

Remind students that while they are exploring during their field trip, they will also be looking for inspiration for their Ice Age themed tessellations that they will finish back in the classroom (or for homework). Handout drawing materials and clipboards (optional) and ask students to make sketches of the animals they might want to turn into a tessellation.

Post-Visit

Pass out supplies for students to create their tessellations. Introduce methods for creating tessellations if you did not do so before your field trip.

On the last two pages, you will find an example of a Saber-toothed Cat tessellation using the single-cut slide / translation method.

When finished, have students share their projects or create a classroom gallery. Give students the opportunity to discuss their ideas and artistic process.

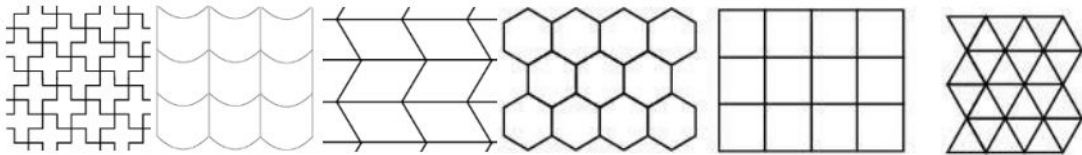
Variations & Extensions

- This project may be completed with any art supplies available to you. Post-it notes, printer paper, colored paper, cardstock all work. The tessellations can be small or large. For larger projects, students may tape or glue them onto a larger sheet of paper, cardstock, or poster board. Please modify as you see fit!
- This project may be completed independently of a Museum visit if you are studying Ice Age animals and unable to go on a field trip.
- ELA Extension: For homework, have students research and write a report about tessellations. Example topics include an artist of their choice other than M.C. Escher who creates tessellations or tessellations in famous architecture around the world.
- If you choose to create a classroom gallery, you can designate museum roles to your students. For example, different students can be in charge of making labels, mounting the artwork on the walls or deciding another method of presentation, grouping the tessellations by themes for presentation (e.g. by animal species, carnivores vs. herbivores, or by artistic choices), or creating a poster to invite other classes to see your gallery.

For younger students:

- This project may be completed without introducing all the vocabulary, such as regular polygon or translation.
- Early education: create tessellations using shape tiles. See if your students can make one that looks like an Ice Age animal.
- If creating a tessellation from their Ice Age sketches is difficult, an alternative is to draw a basic outline of the animal and fill it in with a simple tessellation. Pick a pattern with shapes that fit into the smallest parts of your drawing and fill it without going over the edges. Use a ruler to help get straight lines. When your drawing is filled, color it in and erase parts of your original drawing that distract too much from the tessellation pattern.

These are some example patterns that can be used to fill your drawing, or look up other ones to use.



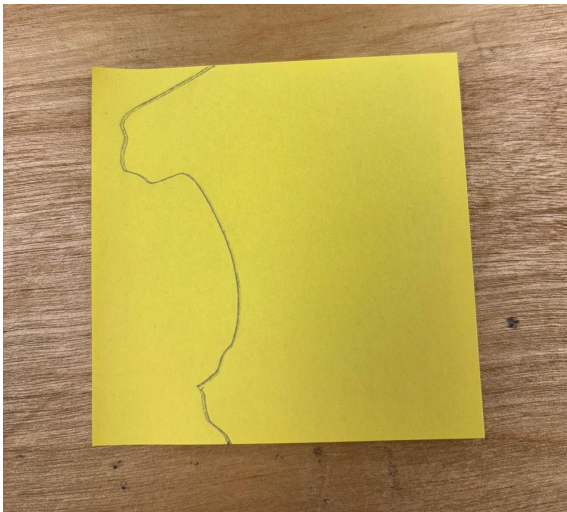
For older students:

- Discuss how to find the area and perimeter of your tessellations. Discuss if anyone's projects are symmetrical.

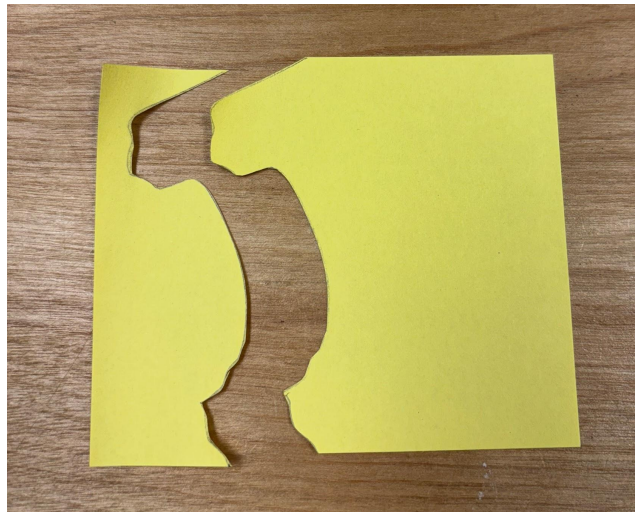
Example: Saber-Toothed Cat Tessellation

This tessellation was created using post-it notes and pencil. The 1-cut slide or translation method was utilized.

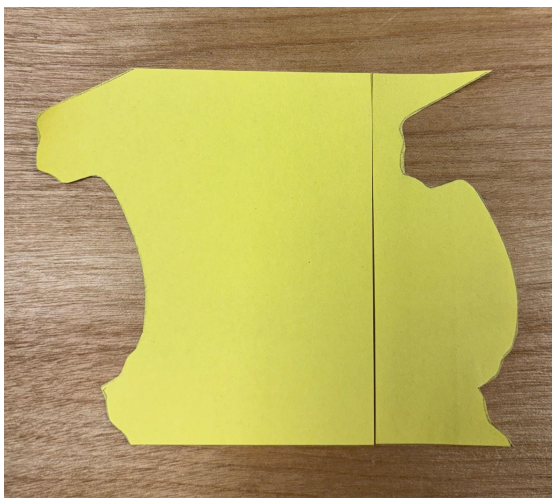
Draw a line on your post-it.



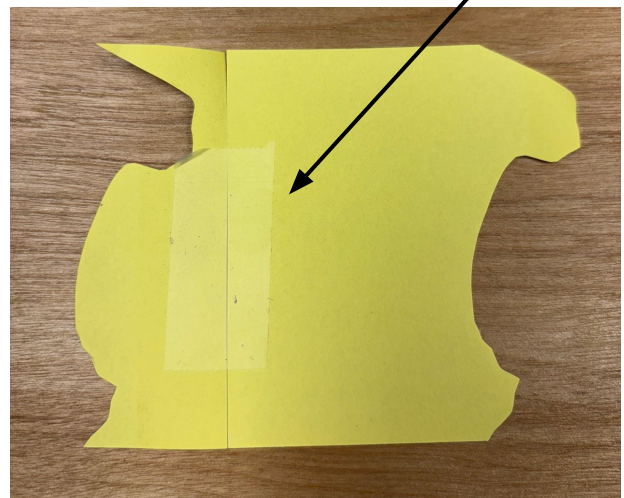
Cut on the line.



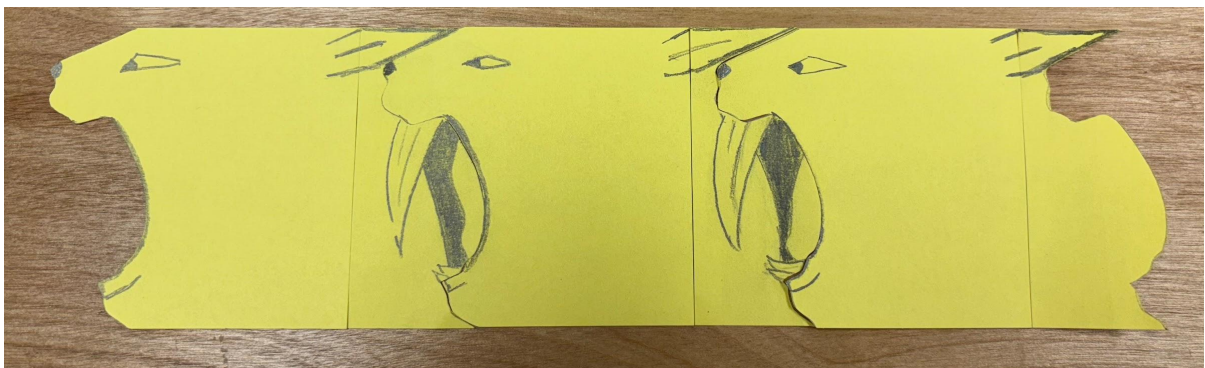
Move the cut-out piece to the other side, keeping its orientation.



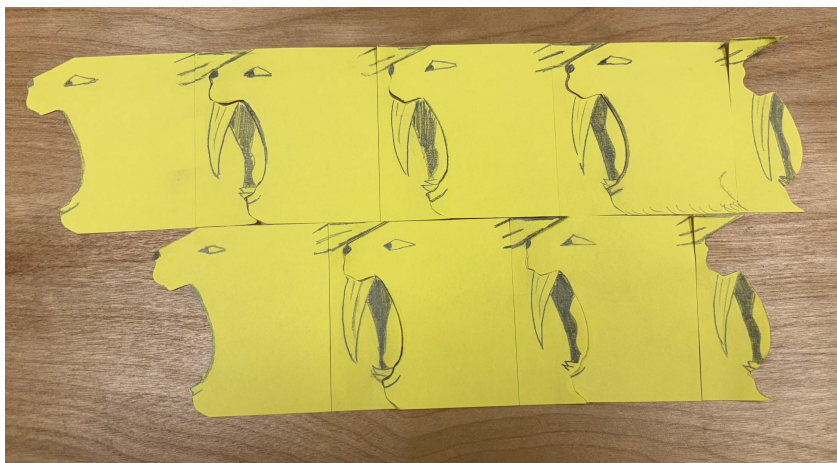
Flip over the two pieces and use tape to secure them together.



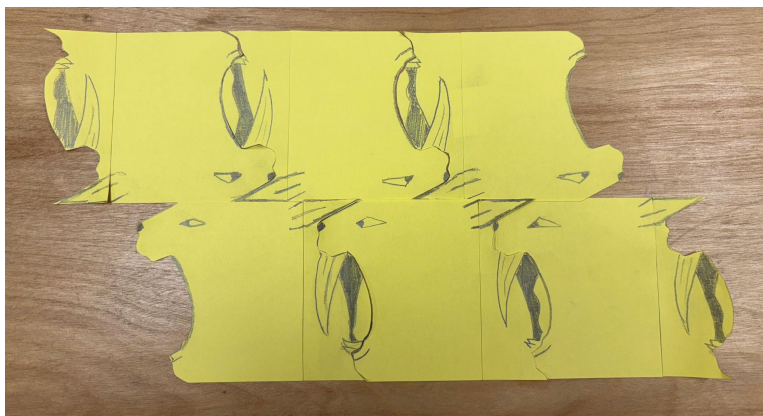
Use the shape you create as a stencil to cut out multiples of the same shape. Once you have multiple pieces, line them up and fit them together. Next, draw details to make it look like your Ice Age animal!



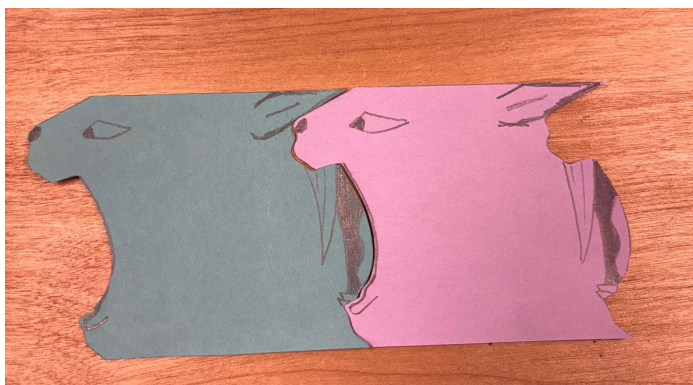
Keep going! Make your tessellation as big as you want.
You can create multiple lines like this:



You can flip some of them upside down like this:



Or use different colors:



If you do not have different colored paper, you can use colored pencils, crayons, or markers.