

# Escher Tessellations

STEAM challenge! Learn to tessellate!

(New math terms are coloured **RED** and are underlined. The glossary for these words is on the last page.)

## Who is Escher?

*Maurits Cornelis Escher (17 June 1898 - 27 March 1972) was a Dutch graphic artist who made mathematically inspired woodcuts, lithographs, and mezzotints. Despite wide popular interest, Escher was for long somewhat neglected in the art world, even in his native Netherlands. He was 70 before a retrospective exhibition was held. In the twenty-first century, he became more widely appreciated, with exhibitions across the world.*

*His work features mathematical objects and operations including impossible objects, explorations of infinity, reflection, symmetry, perspective and tessellations.*

*Early in his career, he drew inspiration from nature, making studies of insects, landscapes, and plants such as lichens, all of which he used as details in his artworks.*

*Escher's art became well known among scientists and mathematicians, and in popular culture and his work has appeared on the covers of many books and albums.*

This video shows a variety of Eschers work. It's mathematically beautiful!

[Escher metamorphose](#)

## **Instructions:**

1. Watch the following short videos

[Easy tessellation](#) This one shows an easy to do tessellation, based on a square.

[What is tessellation?](#) This one shows the beauty of tessellation, but is a bit tricky. We'll try this later.

2. Cut a square piece of paper or card.

## What will I learn?

- Drawing
- Measuring
- Symmetry

## What do I need?

- Pencil
- Paper/card (card is easier)
- Scissors
- Coloured pencils/paint
- Large paper to tessellate on

## What do I do if I get stuck?

[khorn@sd74.bc.ca](mailto:khorn@sd74.bc.ca)

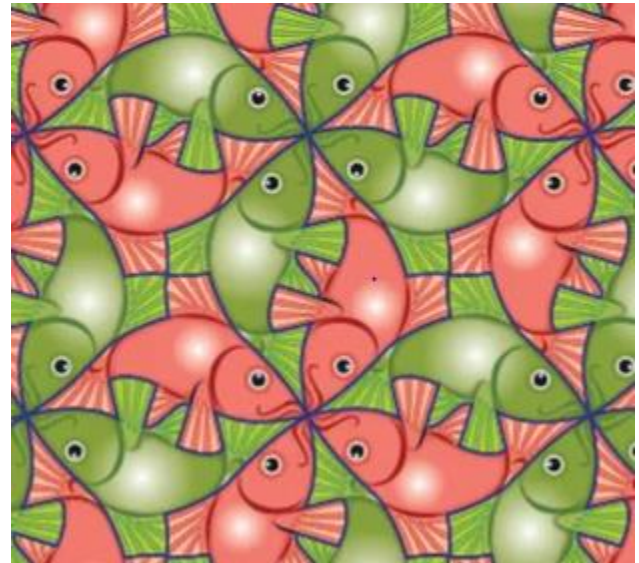
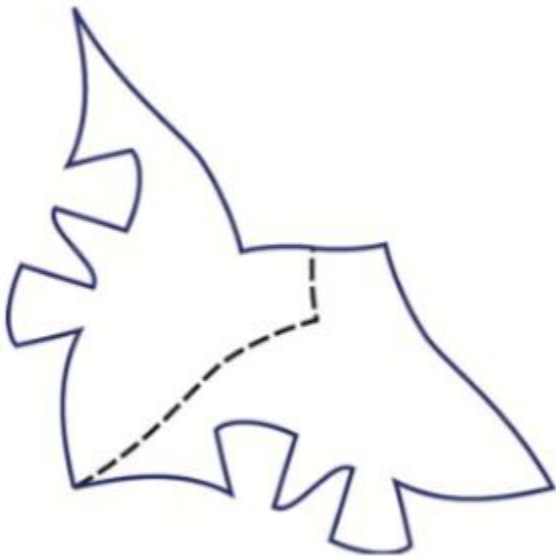
## If I don't have those items?

Do you have Lego? Try to tessellate with it!

3. Watch the first video again, and complete your own tessellation.

You have just completed a translation tessellation.

4. The pictures below, show a different type of tessellation. They are not Escher, but a man called Alain Nicolas, who has been compared to Escher. I included the tile in case you want to try the fish tessellation yourself. They are examples of rotational tessellation.



These ones are very clever!



5. Watch this video [Rotational tessellation](#)  
Now try to make your own rotational tessellation!
6. Email photos of your completed tessellations to [khorn@sd74.bc.ca](mailto:khorn@sd74.bc.ca)

### EXTENSION WORK

Remember the earlier video that I said was a little tricky? Can you now do the third type of tessellation? A “glide reflection”  
Good luck!

Remember, tessellations, on a larger scale can be used to decorate floors and walls in your house. You could celebrate World Tessellation Day on June 17<sup>th</sup>!

#### Glossary

Tessellation	an arrangement of shapes closely fitted together, especially of <u>polygons</u> in a repeated pattern without gaps or overlapping
Polygon	a <u>plane</u> figure with at least three straight sides and angles, and typically five or more
Plane	a flat surface
Translation	movement of a body from one point of space to another such that every point of the body moves in the same direction and over the same distance, without any rotation, reflection, or change in size
Rotational- -Tessellation	a pattern where the repeating shapes fit together by rotating 90 degrees