Learning Guide Module

Subject Code	Math 3	Mathematics 3
Module Code	0	Alternative Assessment
Lesson Code	1	*Analyzing Transformations in Real-Life Designs and Patterns*
Time Limit		90 minutes

TARGET

By the end of this task, the students will have been able to

1. visualize and analyze transformations in various designs and patterns in one's surroundings or in locally-produced materials in the country;
2. value Filipino creativity exhibited in locally-crafted products in the country; and
3. learn the concept of transformations through exploring real-life designs and patterns.

HOOK

Real-life examples of designs and patterns made with transformations are easily recognizable all around us. From the waffles you eat during breakfast, to the intricate patterns of the furniture in your house, to the lovely design of your pillows and bedsheets. Here are photos of some examples:

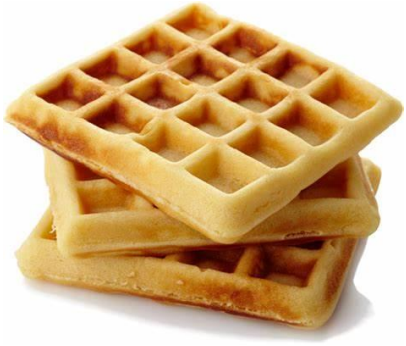

Figure 1.

Figure 2.

Images retrieved from:
https://th.bing.com/th/id/OIP.4XCAssrCKt5BaUrijkUevgHaGW?pid=Api&rs=1
https://www.jaipurfabric.com/products/big-rangoli-print-black-white-bedsheet

We can consider each square in the waffle as a translation of each of the other squares. In the second photo, the design in each petal may be considered a result of reflection, while the petals are placed in a circular manner by rotation.

Many locally-made designs and patterns in the Philippines are also made with transformations. Some examples are shown below.

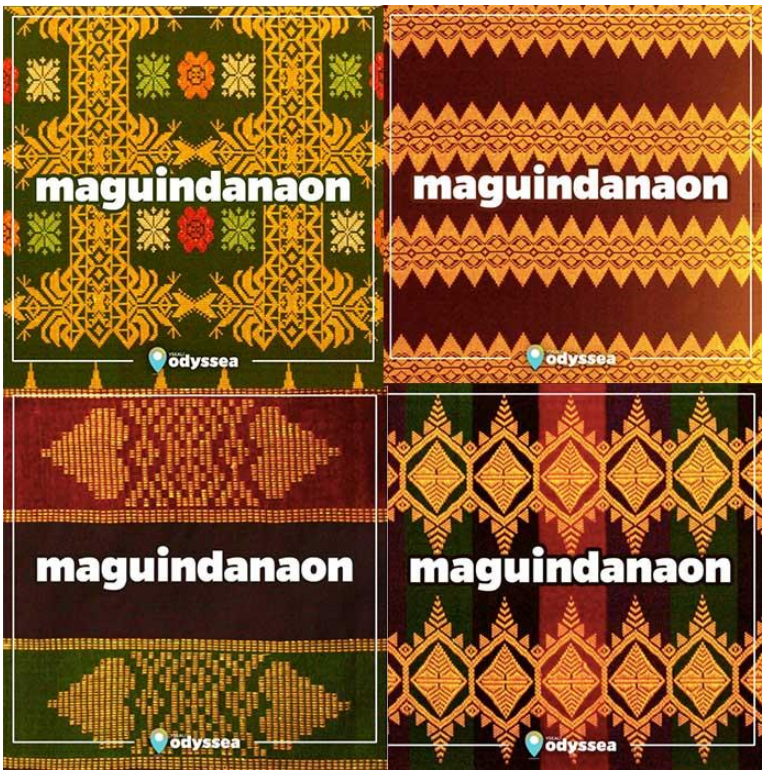

Figure 3. Maguindanaon Fabric Design
Retrieved from: *https://www.esquiremag.ph/culture/design/philippine-indigenous-fabrics-are-making-a-comeback-a00225-20171017-lfrm*

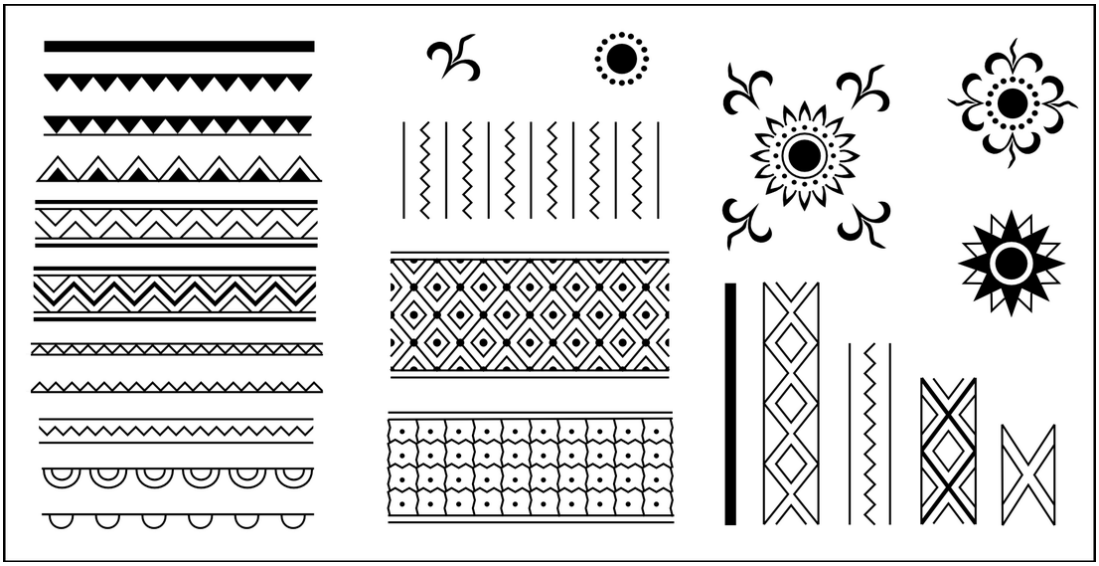

Figure 4. Traditional Visayan Tattoo Design
Retrieved from: *https://tribaletattoos.blogspot.com/2018/12/filipino-tribal-tattoo-design-meanings.html*

Creativity of Filipinos is highly evident in these designs and in our rich culture. The designs shown above are geometric and clearly show transformations of figures such as translation, reflection, and rotation.

IGNITE

Here are the ***instructions*** for this quarter's task:

1. Look for images of designs or patterns in nature, your surroundings, or locally-produced materials in the country exhibiting the use of transformations. These may be photos taken on your own, magazine and newspaper clippings, or photos taken from the internet (with proper citation).
2. Make a pdf file (size 8.5 x 11 inches) that contains the following:
   a) Five (5) images showing each of the discussed transformation in our class: translation, reflection, glide reflection, rotation, and dilation.
   b) For each photo, write a brief description that satisfies these prompts:
      - Give a short background of the subject of the photo.
      - Identify the figure (pre-image) being transformed.
      - State how the figure is translated, reflected, glide reflected, rotated, or dilated.
3. On a separate sheet, create your own design or pattern that exhibits at least two transformations. This design may be made manually or digitally.
4. Write a brief description for your design that answers the following guide questions:
   - What is the idea or theme behind your design?
   - What transformations did you use to come up with your design?
   - Describe your process in creating your output.

Submission Protocols

1. The final output in portable document format (in pdf) not exceeding 10MB in size must be submitted with the file name:
   Surname_FirstName_Math3Q1Project.pdf
   Large-sized images may be compressed to reduce file size.
2. When online submission is not possible, a student may choose to submit his/her output in hard copy.
3. For taking photos, digital cameras or any mobile phone camera may be used. Photos taken from the internet must be properly cited.
4. A student may request to discuss with the subject teacher a possible alternative task if he/she cannot comply with the given project due to internet connectivity problems or laptop/cellphone unavailability.

NAVIGATE

Rubric for Grading

	4	*3*	*2*	*1*
PART I – PHOTOS SHOWING GEOMETRIC TRANSFORMATIONS				
Photos	The photos are excellently chosen and clearly signify geometric transformations.	The photos signify geometric transformations.	The photos vaguely signify geometric transformations.	The photos poorly signify geometric transformations.
Brief Description of Photos	The description is complete and the type of transformation is clearly described.	The description provides ample details and the type of transformation is described.	The description provides incomplete details and the type of transformation is described.	The description provides incomplete details.
PART II – ORIGINAL DESIGN USING GEOMETRIC TRANSFORMATIONS				
Complexity of Design	An intricate and complex pattern is created using a combination of at least two transformations.	A complex pattern is created using a combination of two transformations.	A simple pattern is created using two transformations.	A pattern is created using only one transformation.
Creativity and Originality	The output shows a unique and original design.	The output fairly shows a unique and original design.	The output barely shows a unique and original design.	The output shows no evidence of unique or original thought.
Artistic Expression	The completed output is exceptionally neat and properly colored.	The final output is neat and colored.	The final output is colored but messy.	The final output is messy and not colored.
	The description includes complete required contents.	The description is in need of other required contents.	The description is vague and incomplete.	No description given.
Description of Created Design	The process of performing transformations to geometric figures in the design is clearly and comprehensively stated.	The process of performing transformations to geometric figures in the design is stated.	The process of performing transformations to geometric figures in the design is vaguely stated.	The process of performing transformations to geometric figures in the design is not stated.
TOTAL POINTS	***28 points***			

This output will be considered as an alternative assessment which comprises 25% of your overall grade for the first quarter in Mathematics 3.

KNOT

Things around us take the shape of geometric designs. These shapes have its purposes may it be aesthetic and to serve it utility. On the other hand, to be able to fully visualize geometric transformations in our surroundings demonstrates an exceptional understanding of its concepts. Moreover, these geometric transformations are also evident in patterns and designs that are locally crafted in the country. Aside from helping students hone their skills in visualization, which is vital in studying Geometry, this activity will also spark the value of appreciating Filipino culture.

References:

Albarico, J.M. (2013). THINK Framework. Based on *Science LINKS* by E.G. Ramos and N. Apolinario. Quezon City: Rex Bookstore Inc.

Transformations – Logo Project. (n.d). Mrs. E Teaches Math. Retrieved August 29, 2020 from https://www.mrseteachesmath.com/2017/01/transformations-logo-project.html

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