BEAUTY IN SHAPES AND MEASUREMENTS (LEVEL 1)

Description	Learners use a math lens to look into their house and their body and use what they have learned to create geometric patterns.
Leading Question	How can I use things around me and myself to measure?
Total Time Required	4 hours and a half over 3 days.
Supplies Required	Paper and pencil, (optional: removable stickers like sticky notes)
Learning Outcomes	1. Learning about the characteristics of 2D shapes. 2. Some proportions of the human body. 3. Using the body for spatial measurements and estimations
Previous Learning	Counting, basic names of shapes.

DAY 1

Today you will learn about different geometrical shapes.

Suggested Duration	Activity and Description
10-15 minutes	● Introduce the main 2-dimensional shapes: triangle, square, rectangle and circle. ● A triangle is made of 3 sides, and it has 3 angles or corners. ● A circle is a perfect shape of a set of points that are all exactly the same distance from one point which we call the center. ● A square has 4 equal sides and 4 right (90 degree) angles. ● A rectangle has 4 right angles, but its sides are not all equal.
10 minutes	● Find at least 4 squares around the house. ● Draw one of them.
10 minutes	● Find at least 3 rectangles around the house. ● Draw these rectangles in your notebook
10 minutes	● Find at least 10 circles around the house. ● Can you draw a perfect circle without tracing?

10 minutes	• Find at least 10 triangles around the house. • Put a sticker on every triangle you find and draw it in your notebook.
30 minutes	• Learners will go around the house to see all the triangles that the learner found and identify the ones he or she may have missed and put stickers on them. • From the triangles, identify which ones are: • TIP: if some of the types of triangles were not found, the parent is to draw them and explain the difference with the ones that they found. Equilateral (have 3 equal sides, and angles) Isosceles (having 2 equal sides and one other side that is longer or shorter.) Right (having aa 90-degree angle which looks like a L letter) Optional: Obtuse (having one 'wide' angle) • *TIP: if some of the types of triangles were not found, the parent is to draw them and explain the difference with the ones that they found.*
15 minutes	• Draw at least 3 objects that have a combination of 2 or more shapes from the list of shapes in this lesson, i.e: square, rectangle, triangle, circle. • For practice, you may draw a house that contains all the four shapes. • TIP: If learners find this difficult, you may recommend some objects like: a car, a phone, radio, etc.

DAY 2

Today you will learn about using your body as a measuring device.

Suggested Duration	Activity and Description
10-15 minutes	• Introduce the learner to the worksheet attached. • How tall are you in your own span? • The span is the measure using your own hand from the tip of the thumb to the tip of your little finger. • Stand against a wall and place a sticky note on the wall at the top of your head. • Measure how many spans is that. • Try it with other family members and ask them to measure their height with their own span length. Can you make a conclusion on this?
20 minutes	• What is longer: your height, or your Fathom (the distance between your hands when your arms are stretched sideways)?

	• Sleep on the ground and let your brother/sister place a mark/sticky note where the bottom of your feet touches the floor, and one at the tip of your head. • Open your arms and lay facing down horizontally between the 2 marks. • What distance is longer? • Try the same with other family members, what do you think?
10 minutes	• How many spans is a cubit? (a cubit is the length from you elbow to the tip of your longest finger) • Try the same with other family members, what do you think?
10-15 minutes	• Parents challenge the learners to form the following shapes using their bodies: In how many ways you can form a square using your body? (hint: using your chest and arms, or a small square using your fingers, ….) In how many ways you can form a rectangle using your body? In how many ways you can form a circle using your body? (using your arms, or using your fingers)
15 minutes	• Using your body parts against a wall or the ground, form the following triangles • Right: one leg vertical, one stretched sideways • Isosceles: stand straight and slight open your legs • Equilateral: use your cubits and the side of a table
15 minutes	• What is the height of the room in Fathoms? • You can estimate that in the toilet or kitchen where you have tiles on the wall. • Measure your height in tiles, then count how many tiles are there from floor to ceiling. How many of your heights can fit on top of each other from floor to ceiling?
15 minutes	• Reflection: use your foot to measure the room length. • Repeat by asking your father to measure the same room length using his foot. How different are the 2 measurements? • Why do you think people came up with standards units of measurement? • Supervisor must reinforce that the need for standard units is important because people of different heights would have different measurements of the same object.

DAY 3

Today you will reflect on what you learned and use your new skills in a new worksheet.

Suggested Duration	Activity and Description
10 minutes	• Show the learner a drawing (in day 3 worksheet). It actually shows a man inside a square and a circle. What do we learn from this drawing?
1 hour	• Learners should work on worksheet three.
15 minutes	• Reflection: • How did math help you in creating geometric patterns? • Do you think patterns are beautiful? Why? • Where have you noticed patterns before? Buildings? • Would you try to create patterns? What for, and where would you place them?

ASSESSMENT CRITERIA

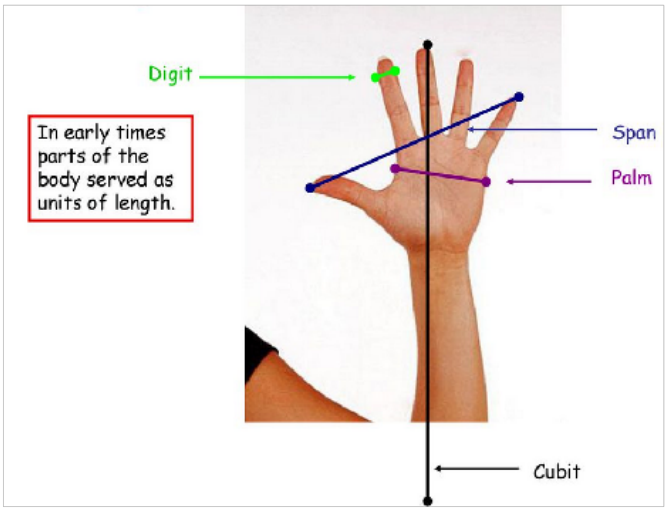
- Observation checklists while learners are working on activities
- Learners answer about their conclusions and reflections
- Learners creativity in the day 3 activities worksheet.

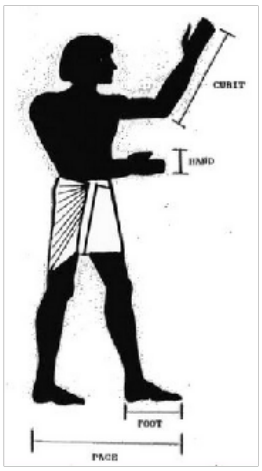
ADDITIONAL ENRICHMENT ACTIVITIES

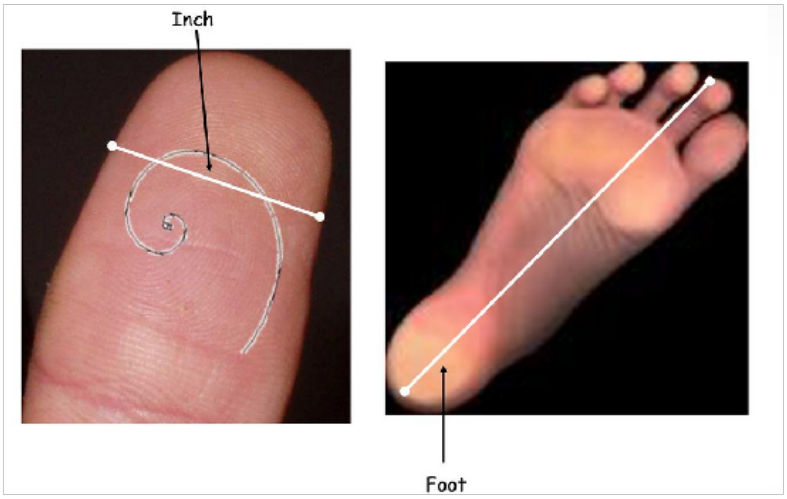
- Create a new pattern other than the ones on the worksheet on a A4 sheet of paper that they can work on during their free time.

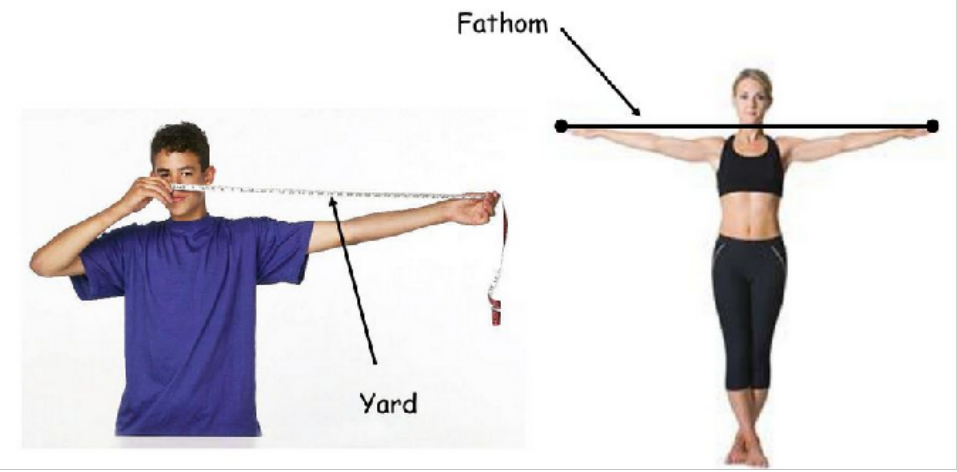
DAY 2 WORKSHEET

Day 2 Worksheet- Body dimensions







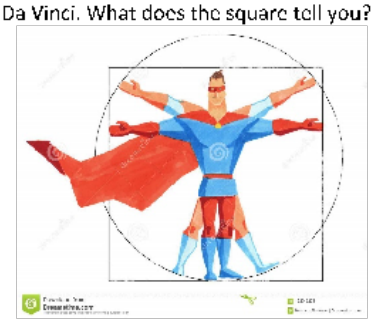


Source: https://slideplayer.com/slide/14948703/

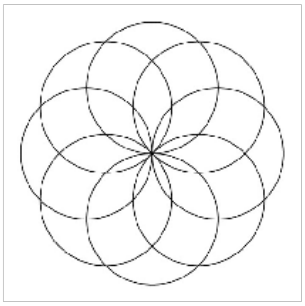
DAY 3 WORKSHEET

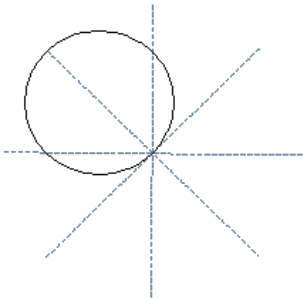
Day 3 worksheet

Cartoon hero based on the Vitruvian man drawing by Leonardo Da Vinci. What does the square tell you? (Hint: fathom versus height?)



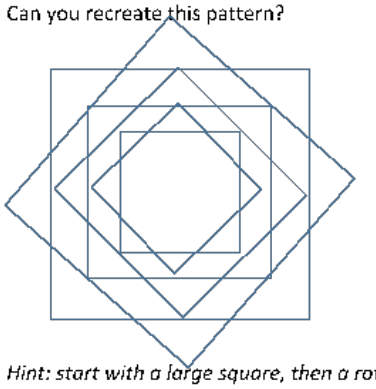
1. Can you draw the following Mandala?

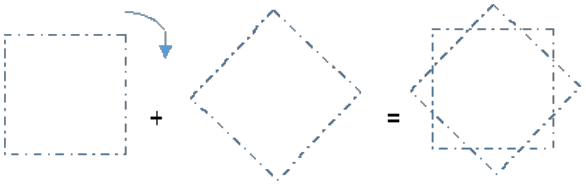




Hint: you can use a cup to draw the 8 circles, with the help of 4 intersecting segments.

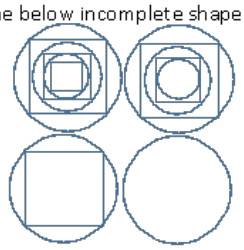
2. Can you recreate this pattern?



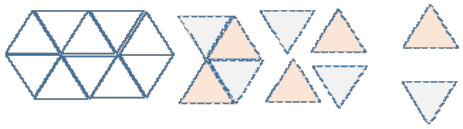


Hint: start with a large square, then a rotated one on top of it, and then repeat with smaller ones inside…

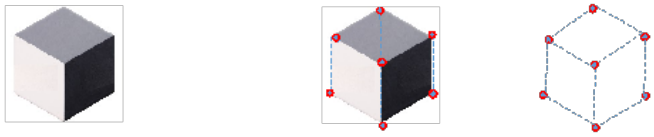
3. Can you create a pattern using two different shapes with repetition to create a larger image?
   See the below incomplete shape made of circles and squares. (are the square sides bent or not?)



4. Here is another example of a pattern using one equilateral triangle repeatedly. Recreate this pattern on a small sheet of paper (A5 size).



5. 3D illusions: Do you know how to draw a cubic box?
   To draw the below cube, you first need to draw the shape, and then to add colors (3 different levels of intensity) to make the effect of light and shadows.



6. (*Optional) Can you draw a pattern by putting those shapes next to one another? Then another layer below? *Then fill a whole page of your notebook with this pattern?*