

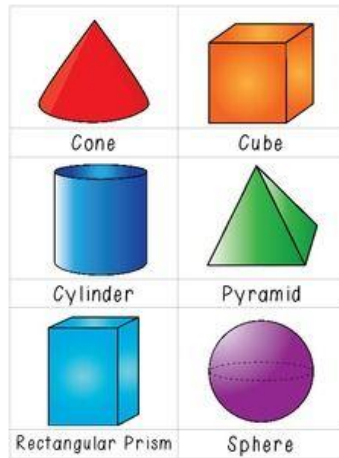
BUILD YOUR DREAM HOUSE (LEVEL 2)

Description	Learners will create a model of their dream house or room and learn about geometry and operations!
Leading Question	How can we use shapes to build our dream house?
Total Time Required	~ 4.5 hours in total over 5 days
Supplies Required	Paper/cardboard, ruler/measuring tape, color pens, scissors, glue/tape/stapler
Learning Outcomes	1. Geometry (grades 2-3): 3D shapes
Previous Learning	<ul style="list-style-type: none"> - Addition within 10 - Some knowledge of 2D shapes

DAY 1

Today you will learn about creating a model of our dream house and practice some math!

Suggested Duration	Activity and Description
20 minutes	<ul style="list-style-type: none"> ● Suggestion: It is recommended that the learner completes the Draw and Calculate Like an Architect project before starting Build Your Dream Home prior to starting this project to get an introduction to scaling models. ● Introduction: we are going to learn how to create a model of our dream house and practice some math! First, let's learn about some shapes that we can use to build our house. ● Show the learner these shapes and ask her or him to identify them. Prompt: do these shapes look familiar? What 2-dimensional shape does each one look like? (e.g. a cube looks like a square, a pyramid looks like a triangle etc.)



Source: <https://www.pinterest.com/pin/430023464416302444/>

- Introduce the learner to some 3 dimensional shapes:
 - A cone has 2 faces, 1 edge, and 1 vertex. The faces of the cone are its circular base and curved part, which is a half-circle.
 - A sphere has 0 faces, 0 edges, and 0 vertices. All points on its surface are the same length from the center
 - A cylinder has 3 faces, 2 edges, and 0 vertices. The faces of a cylinder are its curved middle part (which is rectangular) and its flat top and bottom parts (which are circular in shape)
 - A cube has 6 faces, 12 edges, and 8 vertices. The edges are of equal length and faces are of equal size. The faces are square in shape
 - A rectangular prism has 6 faces, 12 edges, and 8 vertices. The opposite faces of a rectangular prism are equal and are triangular in shape.
 - A square-based pyramid has 5 faces, 8 edges, and 5 vertices. The faces are the flat sides and square base. There are other types of pyramids such as the triangular-based pyramid.
 - Tips:
 - A vertex is also known as a corner, and edges are also called sides. Faces are the flat surfaces of each shape
 - Explain that there are different variations of these shapes that have different properties
 - If the learner needs a refresher on 2-dimensional shapes, you can refer to Level 1 Day 1 activity
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- 20 minutes**
- Let's draw each shape! Bring out your paper, pen or pencil and a ruler or any flat object with a straight side like a phone/bookmark/cardboard or fortified paper and start drawing:

- A cube or rectangular prism: to get a cube, draw overlapping squares, then join the vertices (corners) using straight lines as shown in figure A to get the shape in figure B. if you start with overlapping rectangles and join the vertices, you will get a rectangular prism.

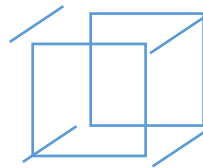


Figure A

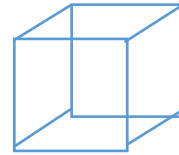


Figure B

- A cone: since a cone has a circular base, start with a flat circle as shown in figure A, then draw two lines connecting at the top to get figure B. Another way would be to draw a triangle, then draw two half circles above and below the base.



Figure A



Figure B

- A cylinder: since a cylinder has two circular parts, start with two circles stacked on top of each other with some distance in between, then join the from both sides as shown below



Figure A



Figure B

- A pyramid: since a square-based pyramid has a square base, start with a flat square (that looks like a diamond) as shown in figure A, then join all the vertices at the top to get figure B as shown below:



Figure A

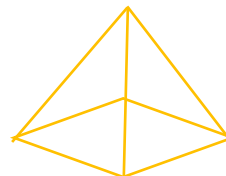


Figure B

- A sphere: start with a circle, then draw two curved lines across the middle part to show that a sphere is not flat like a circle

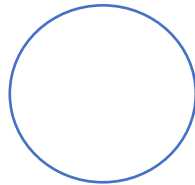


Figure A

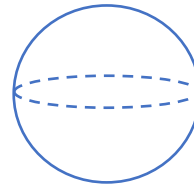


Figure B

DAY 2

Today you will think about how we can design our house!

Suggested Duration	Activity and Description																				
15 minutes	<ul style="list-style-type: none"> • First, let's understand how our own house or apartment was designed. • The learner will walk around the house and try to identify basic geometric shapes in ceilings, walls, and different objects around the house. 																				
20 minutes	<ul style="list-style-type: none"> • With the help of an adult, the learner will list the shapes and objects in their notebook as follows: <ul style="list-style-type: none"> - Living room: square wall, rectangle table, rectangle couch etc. - My bedroom: square wall, rectangle ceiling, round window etc. • The learner will do a tally count of the total number of shapes in each room and complete the table below in her or his notebook <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Room</th> <th>Square</th> <th>Circle</th> <th>Rectangle</th> <th>Triangle</th> </tr> </thead> <tbody> <tr> <td>e.g. living room</td> <td>II</td> <td>I</td> <td>IIII</td> <td></td> </tr> <tr> <td>e.g. kitchen</td> <td>I</td> <td>III</td> <td>II</td> <td>I</td> </tr> <tr> <td>Total</td> <td>3</td> <td>4</td> <td>7</td> <td>1</td> </tr> </tbody> </table> <p>Reflection questions:</p> <ul style="list-style-type: none"> • What 2D shape is most common in our house? • What 3D shape is most common in our house? 	Room	Square	Circle	Rectangle	Triangle	e.g. living room	II	I	IIII		e.g. kitchen	I	III	II	I	Total	3	4	7	1
Room	Square	Circle	Rectangle	Triangle																	
e.g. living room	II	I	IIII																		
e.g. kitchen	I	III	II	I																	
Total	3	4	7	1																	
30-40 minutes	<ul style="list-style-type: none"> • The learner will try to draw the design of the house on a piece of paper to create a floor plan for his or her current home: • Let's start with your bedroom. Think of what your bedroom would look like if we could remove the ceiling and look at it from the top. Example of rooms with a top view: 																				



[Source link](#)

- Tip: if this is too difficult, instead of a top view, the learner can draw the walls of one or more rooms or spaces on separate pieces of paper/pages of his or her notebook with the help of an adult if needed.
- The learner will draw a plan for his or her current home, apartment, or room:
 - Draw the entire space first either from a top view or side/cross-section
 - Section the different rooms or spaces with lines representing walls. Where will you place the kitchen? Bathroom?
 - Draw the beds, tables, rugs etc. that you find in each space

DAY 3

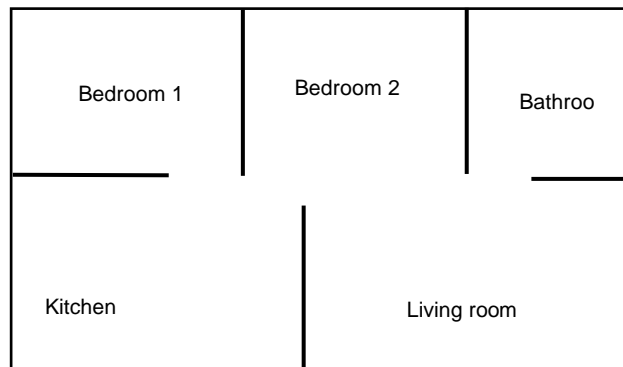
Today you will come up with ideas for their house or room floor plan.

Suggested Duration	Activity and Description
20 minutes	<ul style="list-style-type: none"> ● Today, the learner will come up with the ideas and design for their dream house or room floor plan. Prompts: <ul style="list-style-type: none"> - How do you want your house or room to look? Will the walls be square or rectangular? Can they be triangular? - What other objects do you want there that you can draw or make?
10 minutes	<ul style="list-style-type: none"> ● The learner will recreate and complete this table in his or her notebook:

Room	Object 1	Shape 1	Object 2	Shape 2	Object 3	Shape 3	Object 4	Shape 4
Bed room	Wall	Square	Bed	Rectangular prism	Table	Cube	Pillow	Rectangle
Living room	Wall	Square	Couch	Rectangular prism + rectangle	Table	Cube		

30 minutes

- The learner will draw a plan for his or her dream home, apartment, or room based on the table above:
 - Draw the entire space first either from a top view or side/cross-section
 - Section the different rooms or spaces with lines representing walls. Where will you place the kitchen? Bathroom?
 - Draw the beds, tables, rugs etc. that you want in each space
 - Decorate and color your floor plan
- The plan can be basic following the plan the learner made yesterday or the template below, but it must contain all the items the learner wants in each room



- Tip: allow the learner to be creative, but make sure that the designs are realistic and can be done with minimal resources and supervision

DAY 4

Today you will create the shapes from the table completed yesterday and finalize the design of the house!

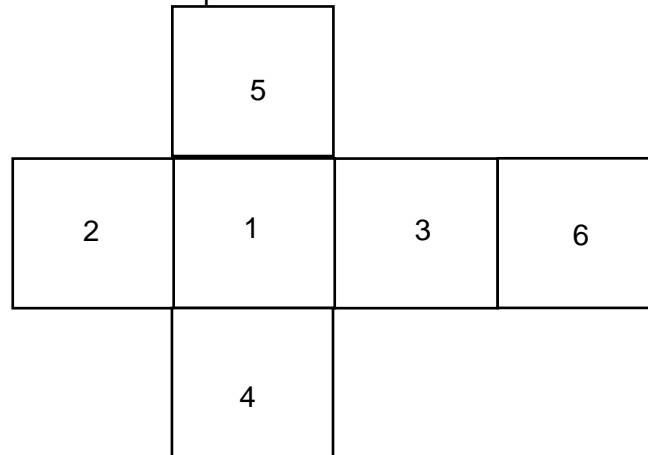
Suggested Duration

40-60 minutes

Activity and Description

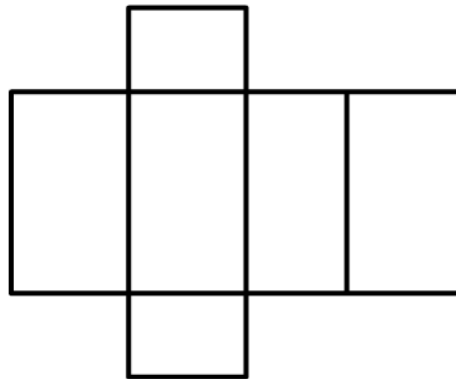
- The learner will make all the shapes using paper. The learner will draw 2D shapes on paper and cut them out using scissors. For 3D shapes, paper will be cut in the following ways:

1. To make a cube: we know that a cube has equal or square sides. First, draw six squares in this shape on a piece of paper then cut out the entire shape:

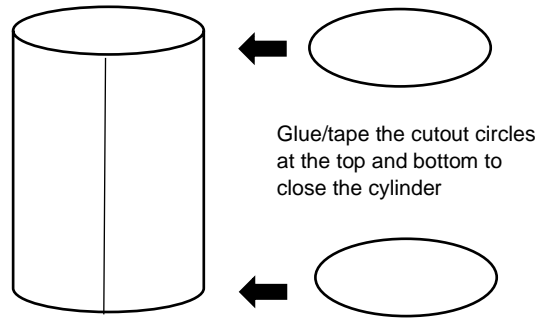


Instructions:

- Keep square 1 down and bring up squares 2, 3, 4, and 5
 - Tape or glue all of them together to create an open cube
 - Bring up square 6 to close the cube. You can cut out square 6 if you want an open cube for your house.
 - You can use this cube as a table or other object to place in your rooms!
2. To make a rectangular prism: we know that a rectangular prism has rectangular sides. First, draw six rectangles in the shape shown below and cut out the entire shape. Then repeat the instructions from the cube, keeping rectangle 1 down and raising the other sides:



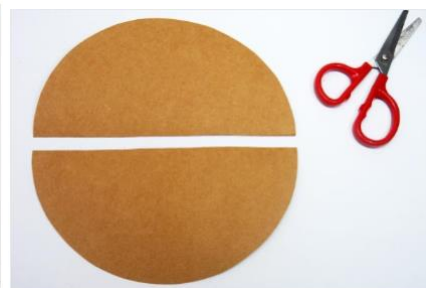
3. To make a cylinder:
- Cut out the piece of paper you want to use to make a cylinder for your furniture
 - Roll the paper so both ends meet as shown below:



- Tape the line where both ends meet to make a cylinder
 - If you want to close the cylinder, you can take the shape you have made and draw two circles on a separate piece of paper using one of its ends. Cut out the circles and tape or glue them on to the top and bottom parts of the cylinder (the faces of the cylinder)
4. To make a cone: we know that a cone has a circular base, so first, draw a circle, then follow the instructions below:



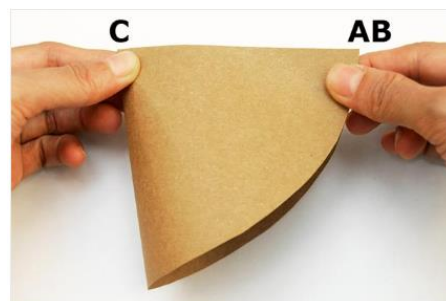
1. Cut out a circle



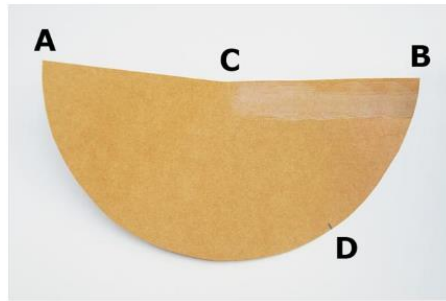
2. Cut it in half



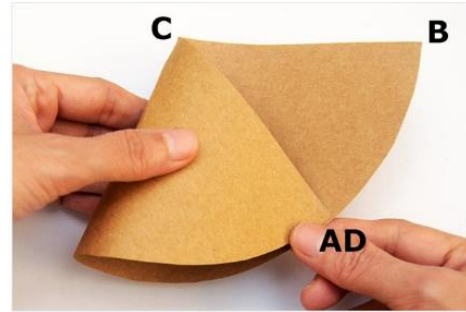
3. take one half-circle



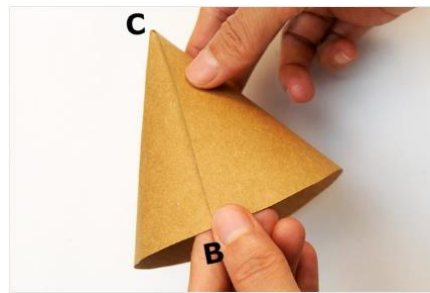
4. Join both ends and mark the vertex C



5. Apply glue and mark point D at the bottom



6. Bring one tip to the bottom, mark that point AD



7. Bring point B down to the curved edge to make a cone!

- Tip: make sure you color the papers before you make the shapes!

DAY 5

Today you will finalize the design of his or her house and present it to the family!

Suggested Duration	Activity and Description
30 minutes	<ul style="list-style-type: none"> • First, the learner will create a big cube or rectangular prism for his or her dream house, room, or apartment. Make sure the shape is big enough to fit all the objects your created yesterday!
20 minutes	<ul style="list-style-type: none"> • The learner will assemble all the objects inside the larger rectangular prism and finalize the design of the house. He or she can draw any additional decoration such as mirrors, paintings, photo frames etc. if he or she does not want to create more shapes
10 minutes	<ul style="list-style-type: none"> • The learner will present the finalized design to the family and describe: <ul style="list-style-type: none"> - How she or he decided on the shape of the house and rooms - How she or he created the objects and the shapes used - Overall thoughts about the process

ASSESSMENT CRITERIA

- Completed house or room with walls, floors, and furniture objects comprised of 2D and 3D shapes.
- Final presentation of design process

ADDITIONAL ENRICHMENT ACTIVITIES

The learner can journal his or her process of designing the house and provide the dimensions of the rooms and spaces, calculate the perimeter (sum of sides or diameter in 2D shapes)

MODIFICATIONS TO SIMPLIFY

- The learner can draw the designs of each room on a separate piece of paper in a 2D format instead of creating a 3D model.
- The learner can create only one type of 3D shape (e.g. cube) or simply draw the pattern on a piece of paper following the templates provided above in day 4