

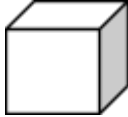



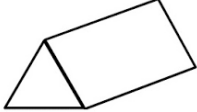
## My DREAM HOSTEL (LEVEL 3)

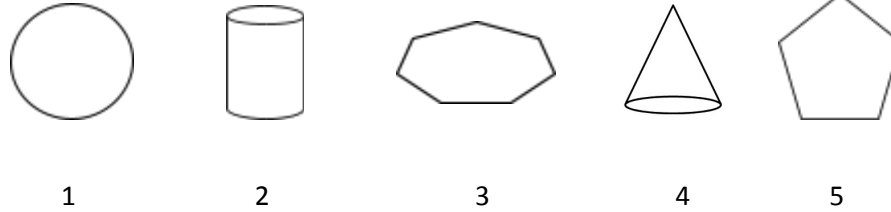
<b>Description</b>	Learners will revise basic 2D and 3D shapes. They will also learn about the different types of angles, triangles, and perimeter. They will use these concepts to build a model of their dream hostel using easily available materials from their surroundings.
<b>Leading question</b>	What will my dream hostel look like?
<b>Subjects covered</b>	Math, Social and Emotional Learning
<b>Total time required</b>	40-60 min a day for 4 days
<b>Resources required</b>	Chart papers, paper, rulers, pencils/ pens, cardboard, glue, scissors, a long string of thread <i>Optional:</i> Thermocole, a protractor, colours
<b>Learning outcomes:</b>	By the end of this project, learners will be able to:  Knowledge-Based Outcomes: <ol style="list-style-type: none"> <li>1. Identify, draw and explain the properties of common 2D shapes such as the number of sides and vertices.</li> <li>2. Identify, draw, and explain the properties of common 3D shapes such as the number of faces, edges, and vertices.</li> <li>3. Identify different types of angles such as acute, obtuse, straight, reflex, and right angles.</li> <li>4. Design and build a model of their dream hostel using the knowledge of 2D and 3D shapes and angles.</li> </ol> 21 <sup>st</sup> Century Skill Outcomes: <ol style="list-style-type: none"> <li>1. Use creativity in designing their dream hostel.</li> <li>2. Collaborate effectively while receiving and incorporating feedback on the design of the model.</li> <li>3. Communicate effectively while presenting models.</li> </ol>
<b>Previous Learning</b>	Names and features of common 2D shapes, measuring straight and curved lines using a ruler
<b>Supervision required</b>	Medium

### Day 1 -

*Today, you will identify shapes around you and revise the properties of basic 2D shapes.*

Time	Activity and Description
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10 minutes	<p><b>Introduction</b></p> <p>Close your eyes! We are all going to step into the future.</p> <ul style="list-style-type: none"> <li>- You have all grown up and are doing jobs that you like.</li> <li>- You have come back to your city/ town/ village and want to give back to society.</li> <li>- In what ways do you want to contribute to making society better?</li> <li>- Can you do something for your school?</li> </ul> <p>Now open your eyes.</p> <p><b>Note:</b> Take a few responses from the learners and appreciate their thoughts. Tell them that one way to give back to society would be to build/ improve the hostel in their school. They could create their dream hostel that would attract more and more learners to school.</p> <p>The <b>Leading Question</b> for this project is: What will my dream hostel look like?</p> <ul style="list-style-type: none"> <li>- To answer this question, you will work in your groups for the next three days and design ymy dream hostel. Finally, you will make models of this dream hostel using easily available materials.</li> <li>- On the fourth and final day of the project, you will present the models of ymy dream hostel to your teachers and peers from other classes/ community members.</li> </ul>												
10 minutes	<p><b>Finding Shapes In the Room</b></p> <p>Look around the room and identify the different 2D shapes that you can see!</p> <p><b>Note:</b> Share the table below with the learners and ask them to do a tally count of the different types of shapes and complete the following table in their notebooks.</p> <table border="1" data-bbox="378 1108 1474 1276"> <thead> <tr> <th>Room</th> <th>Quadrilaterals</th> <th>Pentagons</th> <th>Hexagons</th> <th>Triangles</th> <th>Circles</th> </tr> </thead> <tbody> <tr> <td>Eg. Classroom</td> <td>Eg. IIII</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Which 2D or flat, simple shape is most common in the room?</p> <p><b>Tip:</b> For learners who may struggle with identifying quadrilaterals and polygons, ask them to find basic 2D shapes in their environment like rectangles, squares, triangles, and circles.</p>	Room	Quadrilaterals	Pentagons	Hexagons	Triangles	Circles	Eg. Classroom	Eg. IIII				
Room	Quadrilaterals	Pentagons	Hexagons	Triangles	Circles								
Eg. Classroom	Eg. IIII												
20 minutes	<p><b>Properties of 2D Shapes</b></p> <p>Let us look at some shapes and identify the 2D shapes among them!</p> <p><b>Note:</b> Draw the given shapes and ask learners to identify and draw the 2D or flat shapes.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  1         </div> <div style="text-align: center;">  2         </div> <div style="text-align: center;">  3         </div> <div style="text-align: center;">  4         </div> <div style="text-align: center;">  5         </div> </div>												



The correct answer is:  
(from right to left, first row) 2. Parallelogram, 3. Triangle, 4. Hexagon  
(from right to left, second row) 1. Circle, 3. Heptagon, 5. Pentagon

**Notes:** Remind learners of the properties of 2D shapes - sides and vertices.

- Sides are the straight lines that form the shape.
- Vertices are the corners where two lines meet. For example, a triangle has 3 sides and 3 vertices.



- Ask learners to draw the following table in their notebook and write the number of sides and vertices for each of the 2D shapes they identified above:

Shape	Sides	Vertices
Eg. Circle	0	0

The correct answers are

1. Parallelogram - 4 sides, 4 vertices
2. Triangle - 3 sides, 3 vertices
3. Hexagon - 6 sides, 6 vertices
4. Circle - 0 sides, 0 vertices
5. Heptagon - 7 sides, 7 vertices
6. Pentagon - 5 sides, 5 vertices

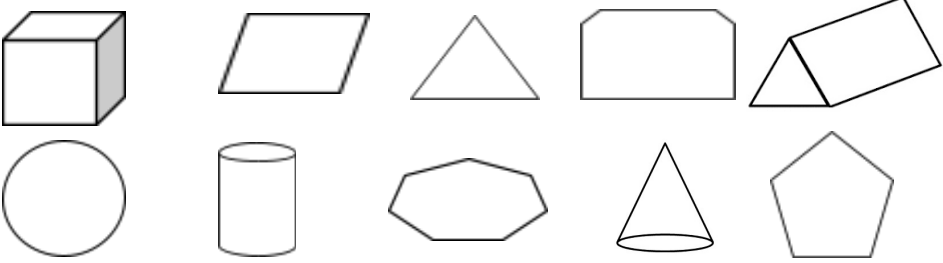
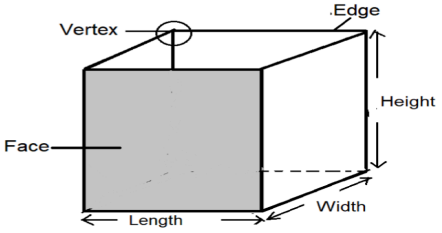
The knowledge of shapes will help you design and build a model of ymy dream hostels. You will use easily available materials from your surroundings to make the models.

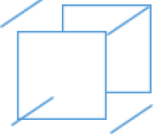
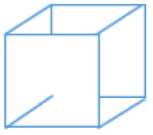
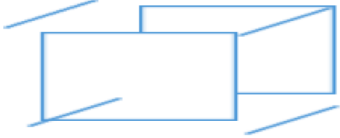
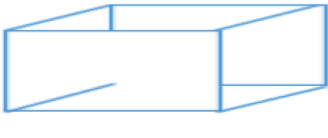


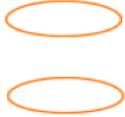
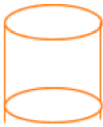
**At-home activities**


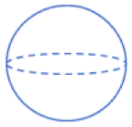
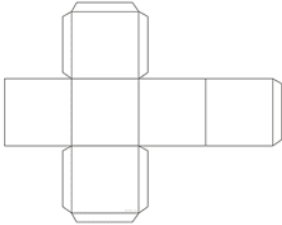
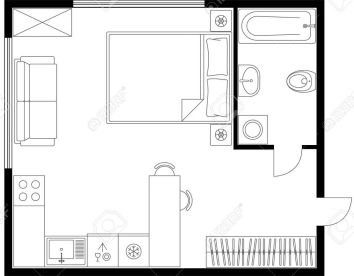
Identify and name as many 2D shapes as possible at your home.

## Day 2

Today, you will learn about the properties of 3D shapes and draw the design of your classroom on paper to understand how to design spaces on paper.



Time	Activity and Description								
15 minutes	<p><b>Properties of 3D Shapes</b>  <b>Note:</b> Draw the following shapes on the board and ask learners to identify the 3D shapes.</p>  <p>The correct answer is:            (from right to left, first row) 1. Cube, 5. Prism            (from right to left, second row) 2. Cylinder 4. Cone</p> <ul style="list-style-type: none"> <li>- Let's understand some important words related to 3D shapes. They have faces, edges and vertices.</li> <li>- The flat surfaces of a 3D shape are called faces. Curved surfaces are not called faces because faces must be flat.</li> <li>- The edge of a 3D shape is the line where two faces meet.</li> <li>- The vertex or corner of a 3D shape is where two or more edges meet. Vertices is the plural of vertex.</li> </ul>  <p><b>Note:</b> Ask learners to draw the following table in their notebook and write the number of faces, edges and vertices for each of the 3D shapes they identified in the beginning:</p> <table border="1"> <thead> <tr> <th>Shape</th> <th>Faces</th> <th>Edges</th> <th>Vertices</th> </tr> </thead> <tbody> <tr> <td>Eg. cone</td> <td>Eg. 1 flat and 1 curved face</td> <td>1</td> <td>1</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>- A cube has 6 faces, 12 edges, and 8 vertices. The edges are of equal length and the faces are of equal size. All the faces are square. A cuboid has the same number of faces, edges, and vertices but all the faces are rectangles.</li> <li>- A triangular prism has 5 faces, 9 edges, and 6 corners. It has 2 triangular and 3 rectangular faces. The triangular faces are always the same size.</li> <li>- A cylinder has 2 flat faces and 1 curved surface. It has 2 edges and 0 vertices.</li> </ul>	Shape	Faces	Edges	Vertices	Eg. cone	Eg. 1 flat and 1 curved face	1	1
Shape	Faces	Edges	Vertices						
Eg. cone	Eg. 1 flat and 1 curved face	1	1						



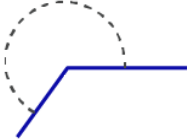
	<p>- A cone has 1 flat face and 1 curved surface. It has 1 edge and 0 vertices.</p>
<p>15 minutes</p>	<p><b>Drawing 3D Shapes</b></p> <p>In the last class, we discussed how you could use the knowledge of shapes to design my dream hostel. To do so, you must know how to draw these shapes. Let us try drawing some 3D shapes!</p> <p><b>Note:</b> Learners will draw some common 3D shapes with the help of the following instructions:</p> <ol style="list-style-type: none"> <li> <p><b>How to draw a cube:</b> Draw overlapping squares, then join the vertices or corners using straight lines as shown in Figure A to get the shape in Figure B.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Figure A</p> </div> <div style="text-align: center;">  <p>Figure B</p> </div> </div> </li> <li> <p><b>How to draw a cuboid:</b> Draw overlapping rectangles and then join the vertices.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Figure A</p> </div> <div style="text-align: center;">  <p>Figure B</p> </div> </div> </li> <li> <p><b>How to draw a cone:</b> 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, and then draw two half circles above and below the base.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Figure A</p> </div> <div style="text-align: center;">  <p>Figure B</p> </div> </div> </li> <li> <p><b>How to draw a cylinder:</b> Since a cylinder has two circular parts, start with two circles stacked on top of each other with some distance in between, then join them from both sides as shown below.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Figure A</p> </div> <div style="text-align: center;">  <p>Figure B</p> </div> </div> </li> </ol>

	<p>5. <i>How to draw a sphere:</i> Start with a circle, then draw two curved lines across the middle part to show that a sphere is not flat like a circle.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Figure A</p> </div> <div style="text-align: center;">  <p>Figure B</p> </div> </div> <p><b>Tip:</b> For advanced learners, guide them to draw the nets for the 3D shapes mentioned above, cut them out and paste them to create 3D models of these 3D shapes. Nets are templates of 3D shapes that can be folded and glued to create actual solid shapes. For example, the net of a cube is given below:</p> <div style="text-align: center;">  </div>
<p>10 minutes</p>	<p><b>Drawing the Classroom</b></p> <p>Now we will draw the design of our classroom/ room on a piece of paper to practise how to design a space on paper. This will help us design my dream hostels in the next class. To do this:</p> <ul style="list-style-type: none"> <li>- Think about what the room would look like if we could remove the ceiling and look at it from the top.</li> <li>- Now, draw what you imagine in your notebook.</li> </ul> <p><b>Note:</b> If possible, show them an example of the top view of a room/ house as shown below.</p> <div style="text-align: center;">  </div> <p><b>Tip:</b> For learners who may struggle to draw the top view of the room, ask them to draw the walls of the room on separate pages of their notebooks.</p>
<p><b>At-home activities</b></p>	<p>If you could not finish drawing the top view of your classroom/ room in class, complete it at home.</p>

### Day 3 –

Today, you will plan ymy dream hostels, and learn about angles and their relevance in designing buildings.

Time	Activity and Description
15 minutes	<p><b>Planning the Dream Hostel</b></p> <p>To design ymy dream hostel, you must ask yourself some questions about what you want or need in the hostel. Think about:</p> <ul style="list-style-type: none"> <li>- How many different areas or rooms do you want in the hostel?</li> <li>- What purpose does each of these rooms have? Would the purpose determine how big or small the room should be?</li> <li>- What are some rooms that you need in the hostel?</li> <li>- Which are the rooms that you want but may not need? <i>(Need is something essential for their survival in the hostel while want is something that they can survive without. For example, a space to eat food is a need but a space to watch TV is a want.)</i></li> <li>- Which shapes do you want to use to design your hostel? <ul style="list-style-type: none"> <li>- Do you want to have rectangular or square walls?</li> <li>- Can the walls be triangles?</li> </ul> </li> <li>- What objects do you need in each of the rooms you design? <i>(For example, dining tables and chairs for the dining area.)</i></li> </ul> <p>Now design ymy dream hostels on paper! Make sure that you:</p> <ul style="list-style-type: none"> <li>- Use at least 2 different shapes.</li> <li>- Include at least 3 utility areas in your designs <i>(such as bathrooms, study space, dormitories, or play areas)</i></li> </ul>
15 minutes	<p><b>Introduction to Angles</b></p> <ul style="list-style-type: none"> <li>- Do you know what angles are?</li> <li>- How can knowing about different types of angles help you in making the models of ymy dream hostels?</li> </ul> <p>The space between two intersecting lines or surfaces is called an angle. Different kinds of angles are:</p> <ol style="list-style-type: none"> <li>1. <b>Right angle:</b> It is in the shape of the letter L and it's exactly 90 degrees. For example, the corner of a book. <div style="text-align: center;">  </div> </li> <li>2. <b>Acute Angle:</b> It is smaller than a right angle. For example, when we make a small V with our fingers, the space between them is less than 90 degrees. <div style="text-align: center;">  </div> </li> </ol>

	<p>3. <b>Obtuse Angle:</b> It is bigger than a right angle but smaller than a straight line. All angles between 90 and 180 degrees are obtuse angles. For example, a widely opened book or a pair of scissors when opened wide.</p>  <p>4. <b>Straight Angle:</b> It's a straight line, and it's 180 degrees. It's like a flat line. For example, a straight pipe.</p>  <p>5. <b>Reflex Angle:</b> It is bigger than a straight angle. Reflex angles are between 180 and 360 degrees. For example, when you bend your arm more than 180 degrees, the outer angle formed at your elbow is a reflex angle.</p>  <p>Notice how the angle between the walls and floor of the room is 90 degrees.</p> <ul style="list-style-type: none"> <li>- Most corners also have right angles because it provides structural stability and makes the room look neat and tidy.</li> <li>- Angles also come into play while designing sloping roofs. They have acute angles and are especially useful in places that experience heavy rainfall or snowfall as it allows water/snow to slide down the roof preventing it from getting collected on top of the building.</li> </ul> <p><b>Tip:</b> For advanced learners who are familiar with the different types of angles, do a quick revision of the different types of angles mentioned above. Follow it up with explaining how to use a protractor to draw angles and get learners to draw different types of angles in their notebooks.</p>
10 minutes	<p><b>Including Angles in the Design</b></p> <p>Relook at the design of your hostels and:</p> <ul style="list-style-type: none"> <li>- Identify where you have already used angles.</li> <li>- Make any changes that you think are necessary.</li> </ul> <p>You must include at least 2 different types of angles in your designs!</p>
<b>At-home activities</b>	<p>Show the design of ymy dream hostel to an elder and inform them of your ideas, and the needs and wants that you have included. Ask them to share feedback, if any, and improve the design of ymy dream hostel accordingly.</p>



## Day 4 –

Today, you will create your models, present them before an audience, and reflect on your learnings through this project.

Time	Activity and Description
20 minutes	<p><b>Building My dream Hostels</b></p> <p><b>Note:</b> If only one learner is participating in the project, you could ask them to create their model at home the previous day and carry out the finishing touches during this section. This way, they will have sufficient time to complete their models before the presentation.</p> <p>Create your model based on your design! Follow these steps to do so:</p> <ul style="list-style-type: none"> <li>- Take out all the material needed to create the models and place them in the centre.</li> <li>- Look at the design of the dream hostel that you created and take some time to think and plan how they would build the model.</li> <li>- Finally, create individual parts and assemble them to make your final model!</li> </ul>
10 minutes	<p><b>Presentation</b></p> <p><b>Note:</b> Ask learners to invite the audience before this section begins.</p> <p>Present your models to your audience! Ask them to think and share feedback on:</p> <ul style="list-style-type: none"> <li>- What did they like about the model? Which is their favourite/most useful part of the model?</li> <li>- Do they have ideas to make the model even better?</li> </ul>
10 minutes	<p><b>Reflection</b></p> <p>Now that we have completed the project, let us think about what we learned through it:</p> <ul style="list-style-type: none"> <li>- What did you enjoy the most?</li> <li>- What did you find the most challenging?</li> <li>- Why do you think this was challenging?</li> <li>- Do you think you built practical models? Why/ why not?</li> </ul>

<b>Additional enrichment activities:</b>	<p>Ask learners to calculate the cost of building their dream hostel based on unit rates, such as for:</p> <ul style="list-style-type: none"> <li>- building 1 sq m of a wall</li> <li>- laying each slab (ceiling)</li> <li>- constructing each flight of 10 stairs</li> </ul>
<b>Modifications for simplification</b>	<p>If it is difficult to draw the top-view of the dream hostel, learners can just draw their hostels on paper before creating their models.</p>

## ASSESSMENT CRITERIA

A majority of my students were able to:

- Identify basic 2D shapes (squares, rectangles, triangles, and circles) in their environment.
- Name basic 2D shapes (squares, rectangles, triangles, and circles) and explain their properties in terms of the number of sides and vertices.

- Name basic 3D shapes (cube, triangular prism, cylinder, and cone) and explain their properties in terms of their number of faces, edges, and vertices.
- Draw a cube, cuboid, cone, cylinder, and sphere.
- Draw the top view of their classroom or a side view of one of the walls of their classroom.
- Identify the different types of angles (acute, obtuse, straight, reflex, and right angles).
- Design and build a model of their dream hostel using at least 2 different shapes and angles, and covering at least 3 utility areas like bathrooms, dormitories, study spaces, play areas, etc.