

A top-down view of a wooden desk. In the center is a white sheet of paper with the text 'USING ISOMETRIC DRAWING TOOL' and 'TEACHING LEARNING OF MATHEMATICS'. To the left is a pen holder with various pens and a silver pencil. At the bottom left is a ruler. To the right is a white coffee cup with dark coffee, a small green plant in a white pot, and a pile of green and yellow snacks.

USING ISOMETRIC
DRAWING TOOL

TEACHING LEARNING OF
MATHEMATICS



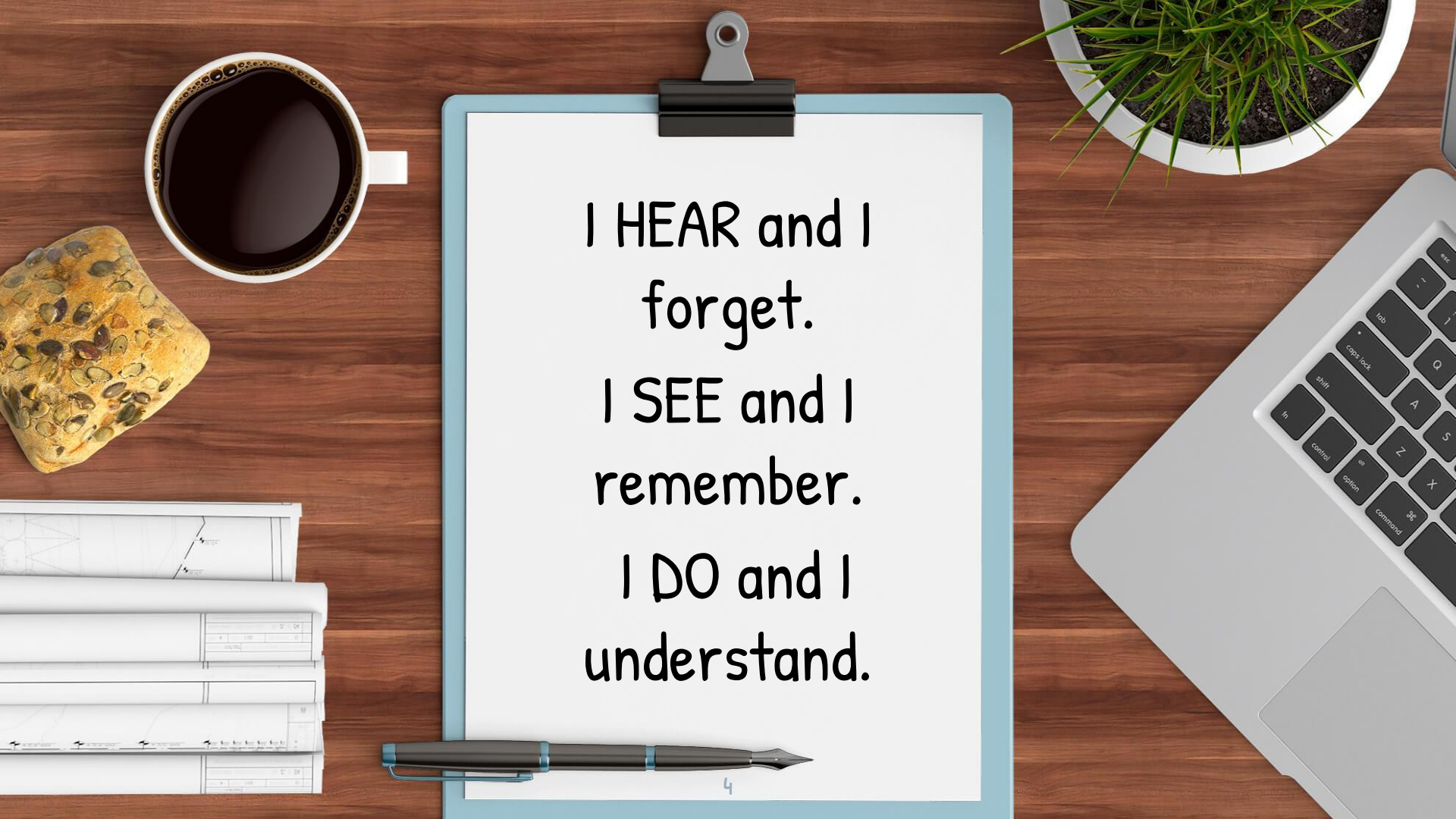
HELLO!

I am Rashmi Kathuria, a learner,
an explorer, a Math teacher!

I am here to share about an interactive drawing
tool which can be creatively used in an online
Math Classroom for visualising and exploring
Mathematics.

- **OBSERVATION**
- **IMAGINATION**
- **VISUALISATION**
- **SELF EXPLORATION**
- **ANALYSIS**
- **CREATION**

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I HEAR and I
forget.

I SEE and I
remember.

I DO and I
understand.

ISOMETRIC DRAWINGS

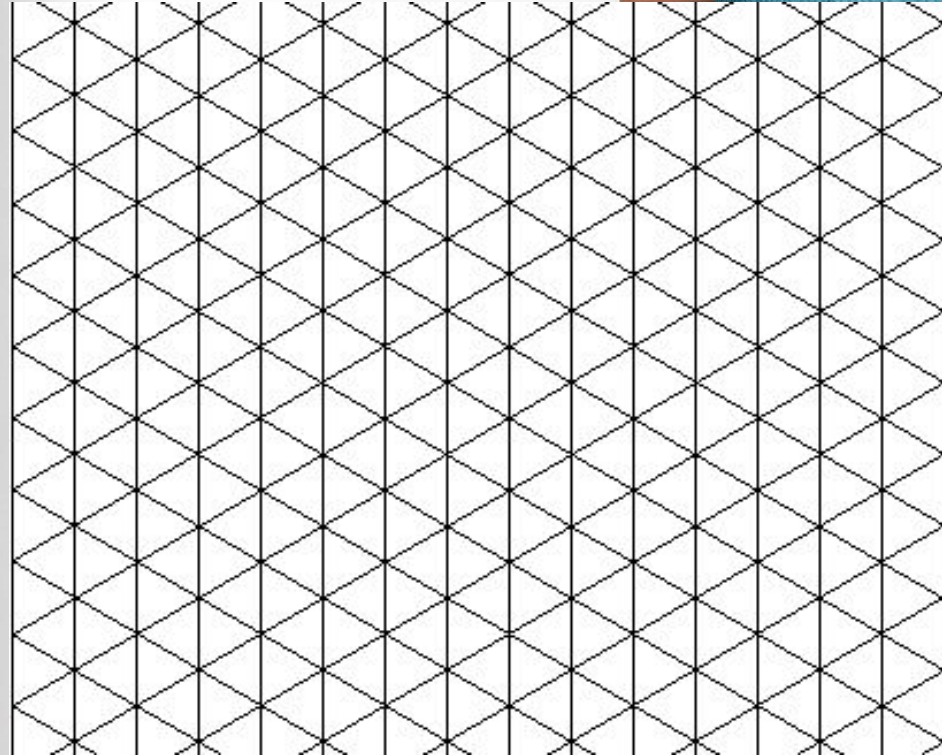
DRAWINGS OF 3D SHAPES ON 2D PAPER.

WE USE ISOMETRIC DOT PAPER.

ISOMETRIC PAPER

isometric (meaning
“equal measure”)

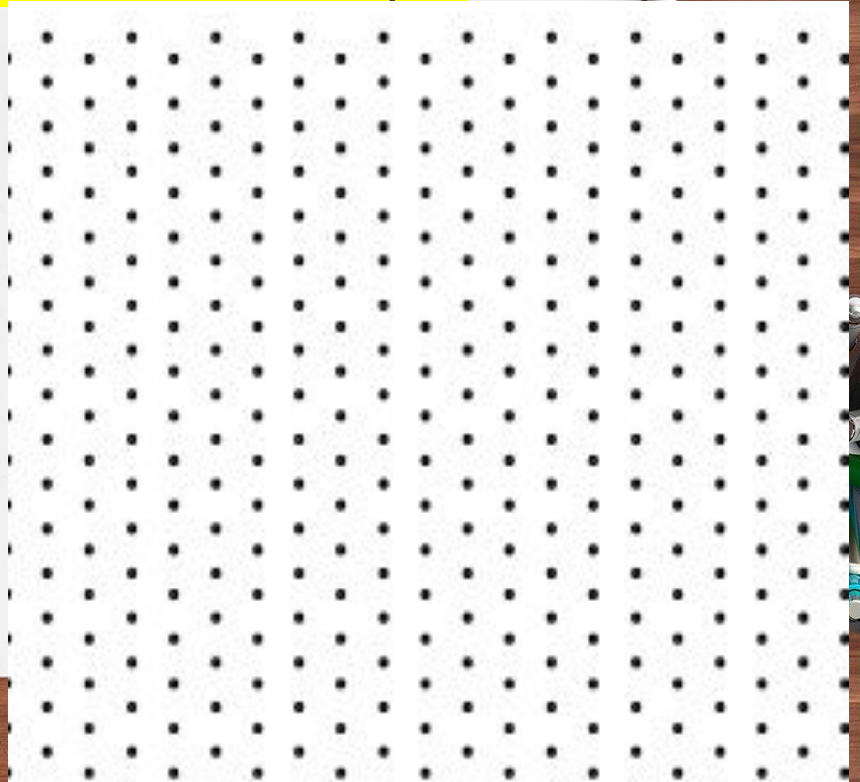
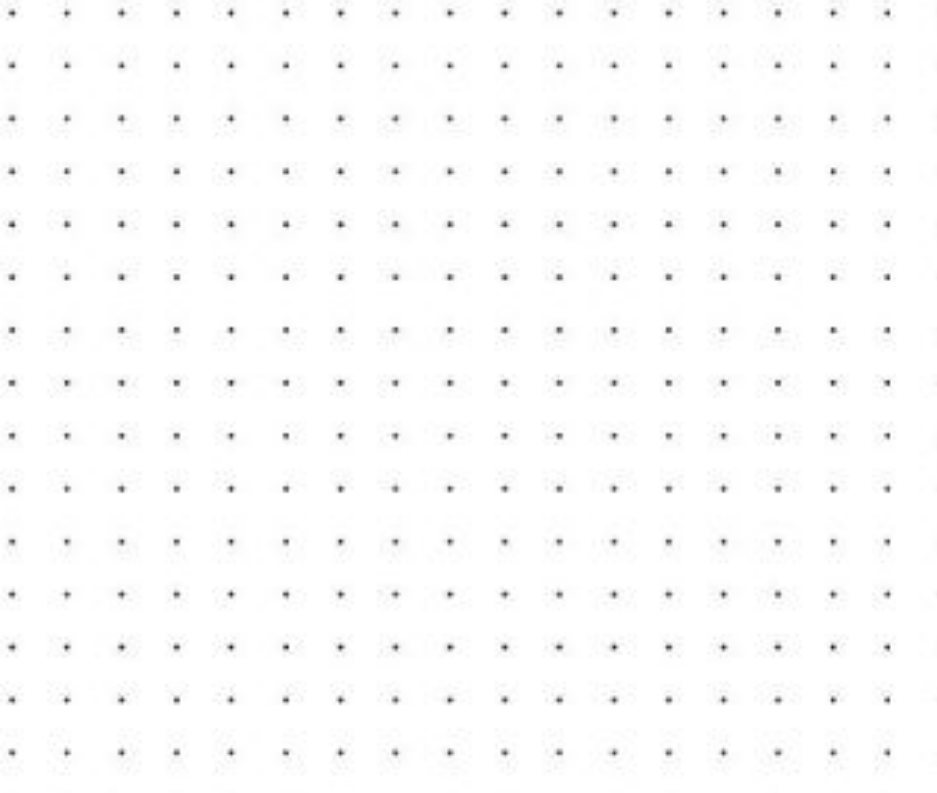
where the X and Z
axes are inclined to
the horizontal plane
at the angle of 30° .



VISUALISE THE DIFFERENCE

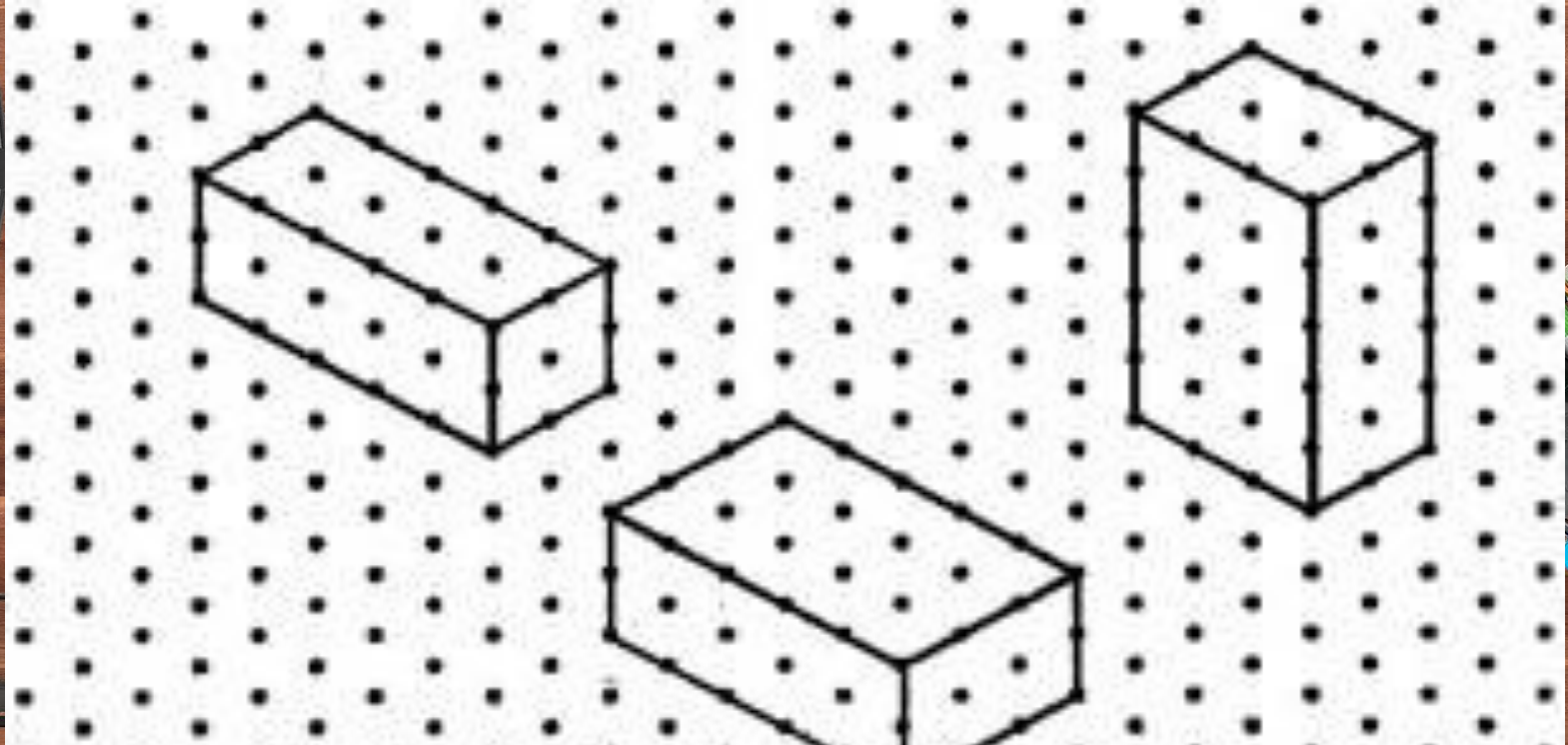
Square dot paper

Isometric Dot Paper



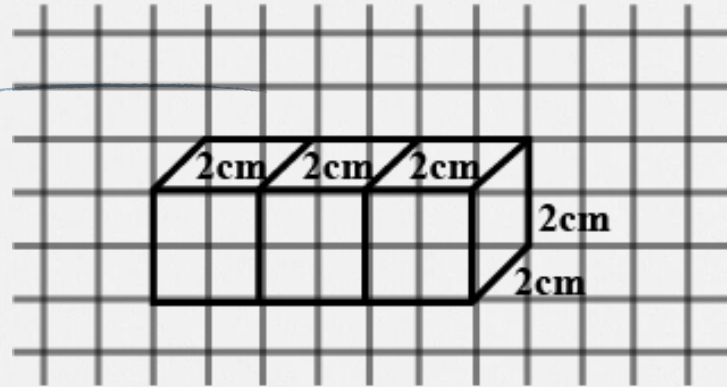
VISUALISE CUBOIDS ON

Isometric Dot Paper

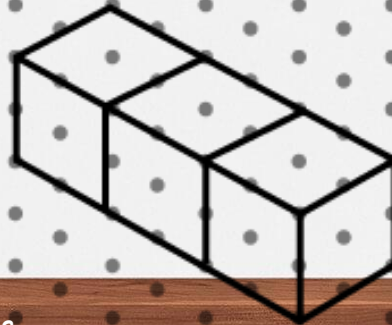


An **oblique** sketch puts more focus on the face or front of an object while an **isometric** sketch puts more focus on the edge of an object. To achieve this, **oblique** sketches are usually drawn using a 45 degree angle to render the 3rd dimension while **isometric** sketches are drawn using a 30 degree angle.

Oblique sketch:



Isometric sketch:



ISOMETRIC DRAWING TOOL



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ILLUMINATIONS

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Isometric Drawing Tool

Grade: 3rd to 5th, 6th to 8th, High School

Use this interactive tool to create dynamic drawings on isometric dot paper. Draw figures using edges, faces, or cubes. You can shift, rotate, color, decompose, and view in 2-D or 3-D. Start by clicking on the cube along the left side; then, place cubes on the grid where you would like them.

This interactive is optimized for your desktop and tablet.

Create



Inspect



x-Axis Position:



y-Axis Position:



z-Axis Position:



Area for drawing



WHAT YOU CAN DO?

- > Use this interactive tool to create dynamic drawings on isometric dot paper.
- > Draw figures using edges, faces, or cubes.
- > You can shift, rotate, color, decompose, and view in 2-D or 3-D.

Note This interactive is optimized for your desktop and tablet.

- > Click on Create cube
- > Place it on drawing area

Create  Inspect 




 x-Axis Rotation:



 y-Axis Rotation:

 z-Axis Rotation:

CREATE CUBE



ACTIVITY 1(A) EXPLORING FACES OF A CUBE

- > Use rotate tool to see faces
- > Use paint tool for colouring faces

The screenshot displays a software interface with a top navigation bar containing 'Create' and 'Inspect' tabs. Below the navigation bar is a toolbar with two rows of icons. The first row includes five green icons: a cube with a plus sign, a cube with a plus sign and a dot, a cube with a plus sign and a dot, a cube with a plus sign and a dot, and a rotate icon. The second row includes five icons: a mouse cursor, a paintbrush, a paintbrush, a rotate icon, and a cube. Below the toolbar are three sliders for 'x-Axis Position', 'y-Axis Position', and 'z-Axis Position', each with a blue slider knob and left/right arrow buttons. To the right of the interface is a white grid background. Three cubes are shown: a red cube at the top right, a multi-colored cube (green, yellow, cyan, magenta) at the bottom left, and a purple and red cube at the bottom right. A red arrow labeled 'ROTATE' points to the rotate icon in the toolbar, and another red arrow labeled 'PAINT' points to the paintbrush icon. A small green arrow labeled 'x' points to the x-axis label on the grid.

ACTIVITY 1(B) DRAWING ISOMETRIC SKETCH

- > Use line tool for drawing a cube

The screenshot shows a software interface with a 'Create' tab and an 'Inspect' tab. The 'Create' tab is active, displaying a toolbar with various drawing tools. A red arrow points to the 'CREATE LINE TOOL' icon, which is a green square with a white line and a plus sign. Below the toolbar is a color palette with 20 color swatches. The main workspace is a light blue grid with a white dot pattern. A black wireframe cube is drawn on the grid. A red arrow points from the 'CREATE LINE TOOL' icon to the cube. In the bottom left corner of the workspace, there is a 3D coordinate system with x, y, and z axes. The number '15' is visible in the bottom right corner of the interface.

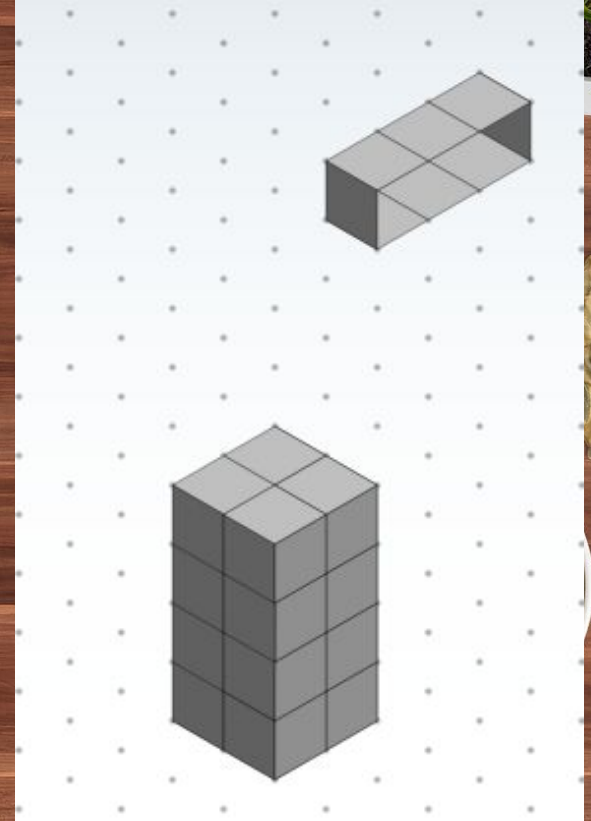
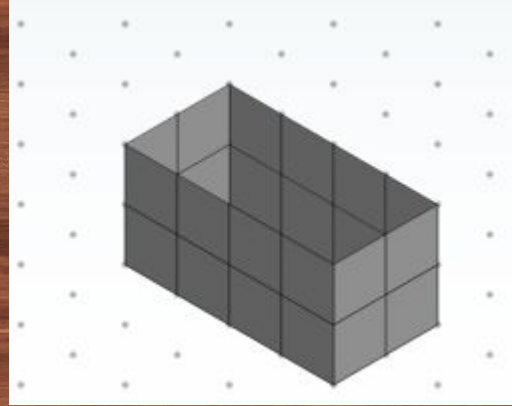
ACTIVITY 1(D) MAKING A CUBE

- > Use Create x face tool
- > Use Create y face tool
- > Use Create z face tool
- > Use Paint tool
- > Use Rotate tool

The screenshot displays a 3D software interface with a grid background. On the left, there is a 'Create' tab with a cube icon and an 'Inspect' tab with a magnifying glass icon. Below these are two rows of tool icons: the first row contains five green icons with a plus sign, and the second row contains five green icons representing different tools. Below the tool icons are three rotation sliders labeled 'x-Axis Rotation:', 'y-Axis Rotation:', and 'z-Axis Rotation:'. Each slider has a blue knob and arrowheads. In the center-right of the grid, a cube is being constructed with colored faces (yellow, red, blue). At the bottom left, a 3D coordinate system is shown with x, y, and z axes.

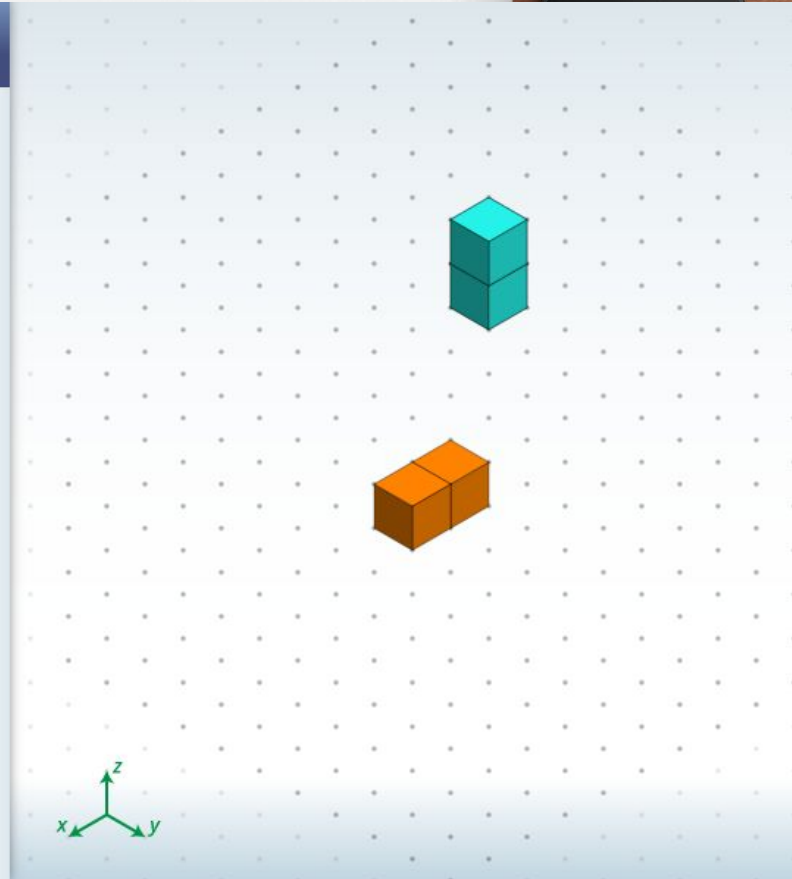
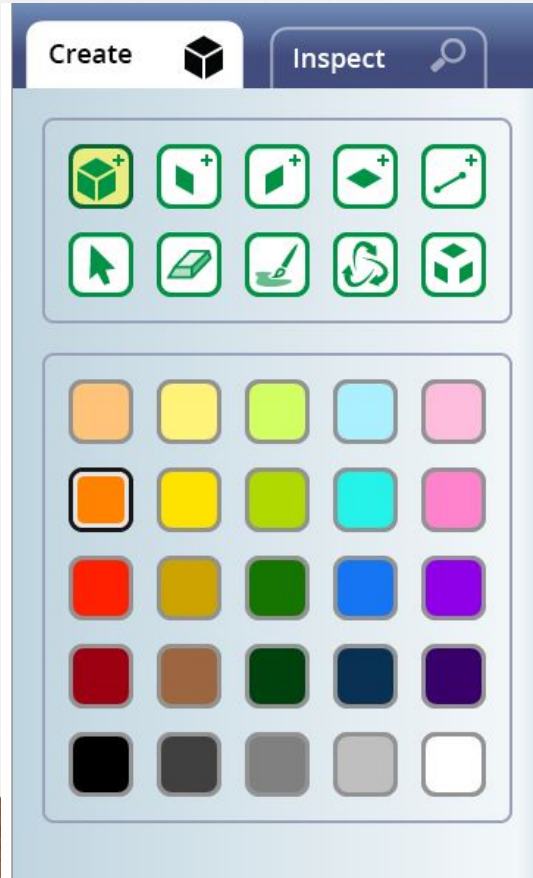
ACTIVITY 1(D) USING FACE TOOL

- > Use Create x face tool
- > Use Create y face tool
- > Use Create z face tool
- > Use Paint tool
- > Use Rotate tool



ACTIVITY 2 EXPLORING TWO CUBE ADJACENT TO EACH OTHER

- > Use Create cube tool
- > Place cubes adjacent to each other



THINKING/OBSERVATION BASED QUESTIONS

- > What is the new shape obtained?
- > What is the surface area?
- > What is the volume?

WS3 Q8 Let us solve together...

Two cubes each of side 4 cm are joined end to end. Find the surface area of the resulting cuboid.



Class VIII Maths Ch Mensuration

Playing with unit cubes

EXPLORING CUBES AND CUBOIDS



Interactive

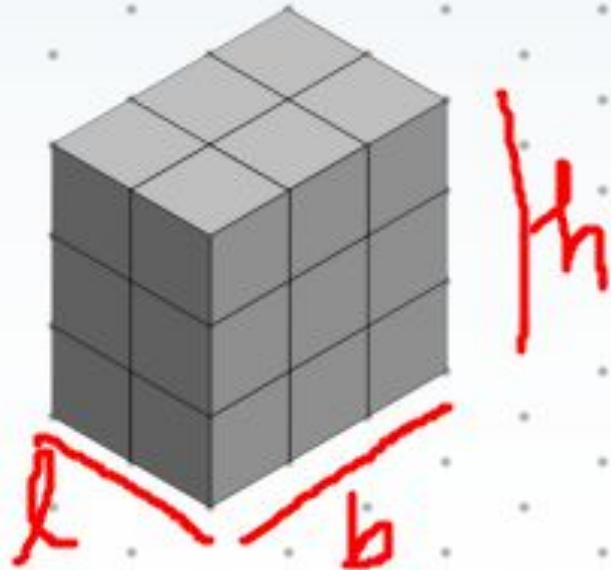
ACTIVITY 3 PLAYING WITH UNIT CUBES

- > Use Create cube tool
- > How many unit cubes are there?
- > How many unit cubes are required to make a cuboid of size $2 \times 3 \times 2$?

The screenshot displays a digital workspace for creating and inspecting 3D shapes. At the top, there are two tabs: "Create" and "Inspect". Below the "Create" tab is a toolbar with icons for creating various 3D shapes: a cube, a rectangular prism, a triangular prism, a cylinder, a cone, and a sphere. Below the toolbar is a color palette with 20 colored squares. The main workspace is a light blue grid with a 3D coordinate system (x, y, z) in the bottom left corner. A 3D cuboid is shown on the grid, composed of 12 unit cubes arranged in a $2 \times 3 \times 2$ structure.

ACTIVITY 4 VOLUME WITH UNIT CUBES

- > Use Create cube tool
- > How many unit cubes are there?
- > What is the volume of shape obtained?



ACTIVITY 4 DIFFERENT VIEWS OF AN OBJECT

- > Use Create cube tool
- > Use inspect tool

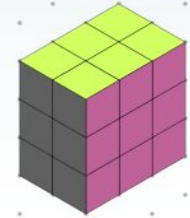
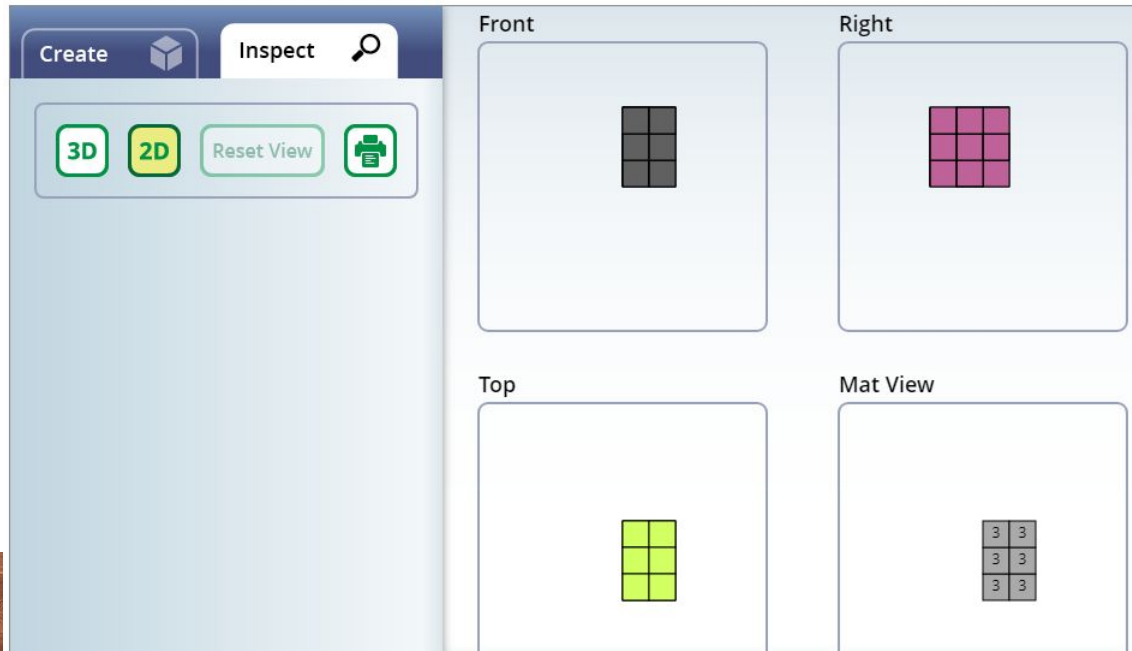
The screenshot displays a software interface for inspecting a 3D object. The top bar has 'Create' and 'Inspect' tabs. The 'Inspect' tab is active, showing a toolbar with various tools. Below the toolbar, there are buttons for '3D', '2D', 'Reset View', and a printer icon. The main area is divided into four viewports:

- Front:** Shows a small black square.
- Right:** Shows a horizontal row of three blue squares.
- Top:** Shows a vertical column of three green squares.
- Mat View:** Shows a vertical column of three grey squares, each with the number '1' inside.

To the right of the interface, a 3D model of a cube is shown on a grid background. The cube is colored with green on top, blue on the front and right sides, and yellow on the left side.

ACTIVITY 4 DIFFERENT VIEWS OF AN OBJECT

- > Use Create cube tool
- > Use inspect tool



TEACHING IDEAS OF USING ISOMETRIC DRAWING TOOL

- > Use it in a synchronous mode while teaching online. Have a creative discussion with children.
- > Children can create 3D shapes and share their work.
- > Create worksheets on counting unit cubes/missing using cubes/different view of an object
- > Use the snapshots for assessment via Google form

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Isometric Drawing Tool - National Council of Teachers of ...

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THANKS!

Any questions?

Find me at rashmikathuria2013@gmail.com

CREDITS

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