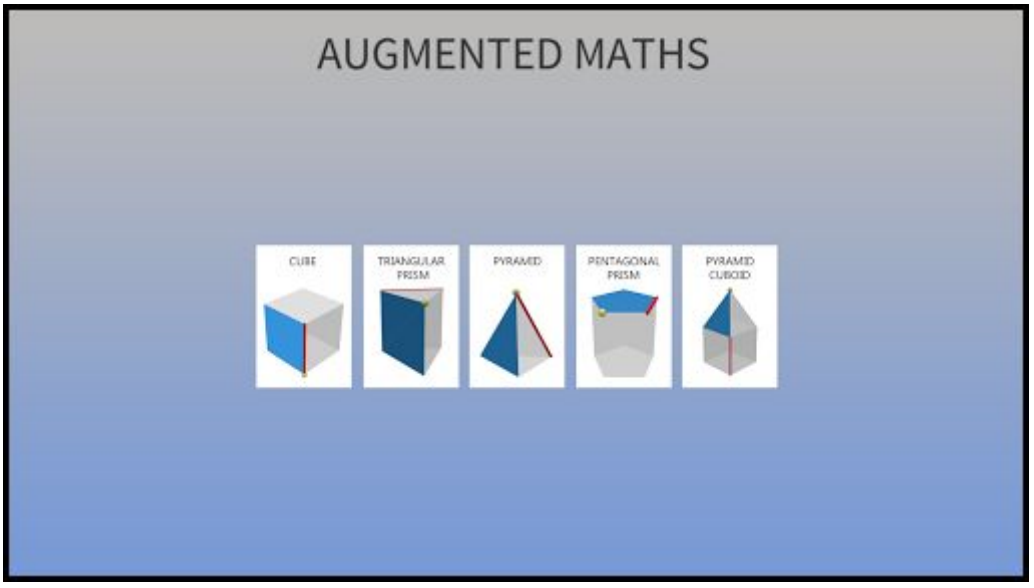
AUGMENTED MATHS

User manual pdf

In this file, you will find stepwise instructions on how to use each of the sub-apps, starting with the Euler's rule.

To get the count of vertices/edges/faces for a polyhedron :

Step 1 - Choose a polyhedron from the given panel on the 'Home' screen
We have provided a set of 5 polyhedrons taken from the NCERT textbook.



Step 2 - Count the vertex, edge & face of the polyhedron you have chosen
2.1 : Activate AR app
Point the camera on page 165 in any NCERT Class 8 Mathematics textbook (The page functions as the marker). If you do not use NCERT textbooks, you can download the marker from 'Resources required' in the webpage. Remove the marker once 3D object is tracked by the AR camera in the application.

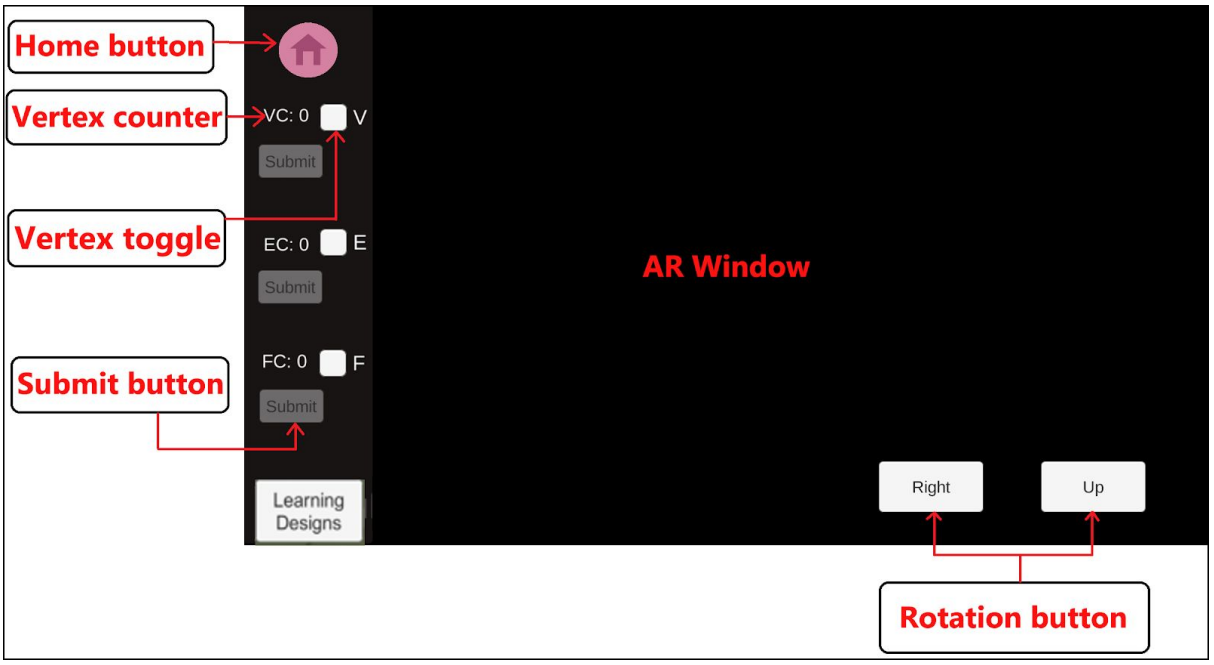


Figure 1: Layout of the AR app screen

2.2 : Choose which parameter to count (Vertices/Edges/Faces)

Vertex Toggle (V) - Click on this checkbox to start counting the vertices of your chosen shape. Note, you have to click on the vertex toggle first, then only the vertex counter will get activated & you can start counting vertices. The edge toggle (E) and face toggle (F) have similar functionality for counting edges and faces for the polyhedron respectively. (Fig.1).

Vertex Counter (VC) - This counter keeps track of the number of correct vertices that you have clicked for your chosen polyhedron. The Edge counter (EC) and Face counter (FC) has similar function for count of edges and faces (Fig.1).

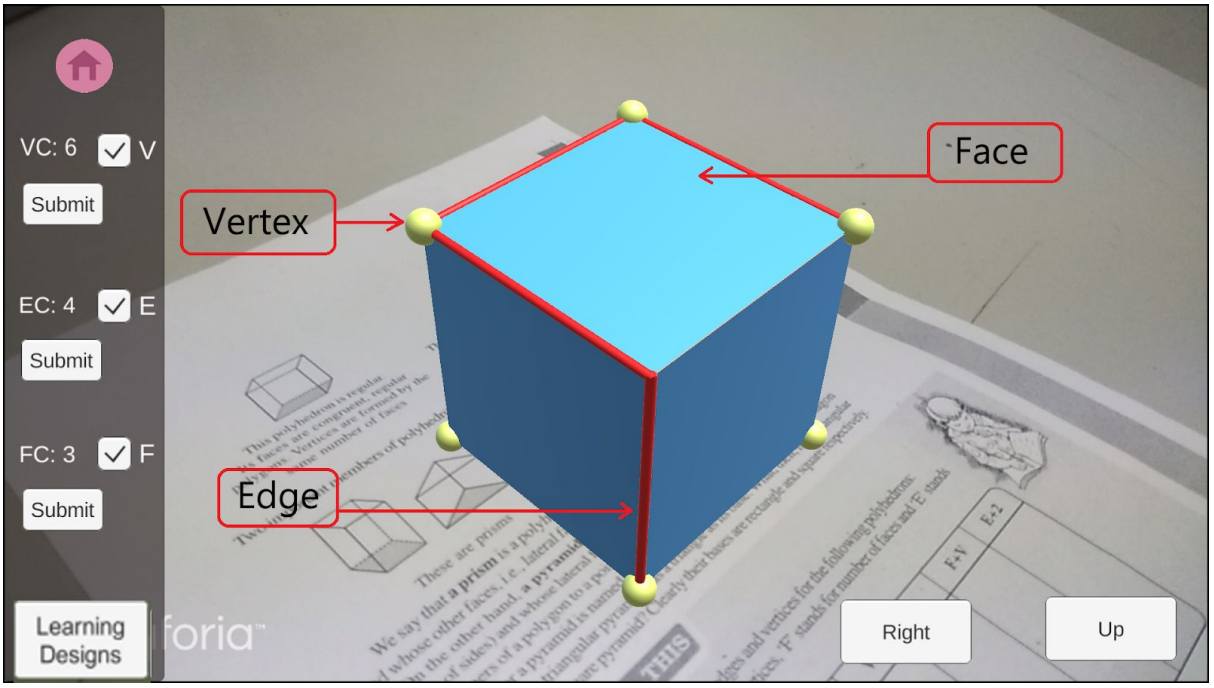


Figure 2: Screenshot of counting vertices, faces & edges of a cube

2.3 Start counting

- To select the vertices, tap the corners of the selected polyhedron with one finger tip. A successful count is indicated by appearance of a yellow ball (Fig.2)
- To select the edges, tap the the sides of the selected polyhedron with one finger tip. A successful count is indicated by appearance of a red line (Fig.2)
- To select the faces, tap anywhere within the the polyhedron with your finger. A successful count is indicated by appearance of a blue surface (Fig.2)

2.4 Rotation Button - Use these buttons (Fig. 1) to rotate the 3D object along 2 axes. This will help you view the 3D objects from the different angles to check if you have missed counting any. Use your fingers on the touch screen to increase or decrease the size of the object as per your convenience.

Step 3

Submit - Click on the submit button once you have completed the count of vertices, faces and edges, press submit button to check if your answer is right or wrong. If your answer is wrong, you will be given 1 more try to get the

correct answer. If you still get incorrect answer, the correct answer will be displayed.

Step 4

Back to Home - Once you have taken the counts for one polyhedron, you can proceed to do the same with another polyhedron. Simply click on the Home button on the top left (Fig.1) to see the panel of polyhedrons again.

Built-in Teacher Support

The single app on topic - Euler's rule can be used to achieve different learning objectives. We provide built-in lesson plans(learning designs) for each of the HOTS level learning objectives possible with this app. Read below to see how to access these lesson plans at runtime while teaching in the class with this app.

Choosing the Learning Design

Step 1 : Choose your learning objective

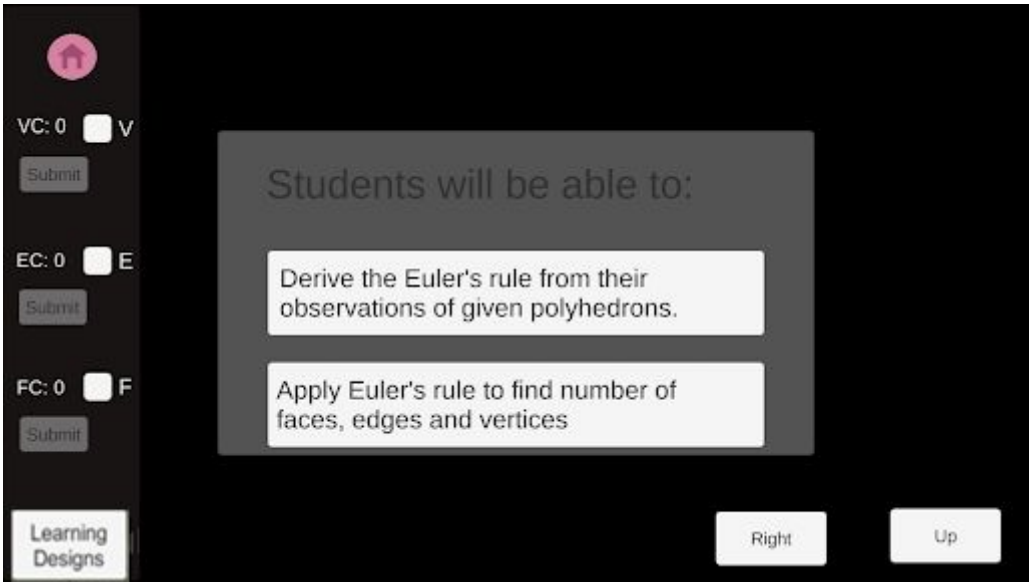


Figure 3: Screenshot for selecting Learning Objectives.

- Press the 'Learning Design' button from the side panel (Fig. 3)
- Now choose your learning objectives from the options given.
- Once you choose, you will get an active - learning Learning Design with AR, mapped to your chosen objective.

Step 2 : Navigating through the Learning Design

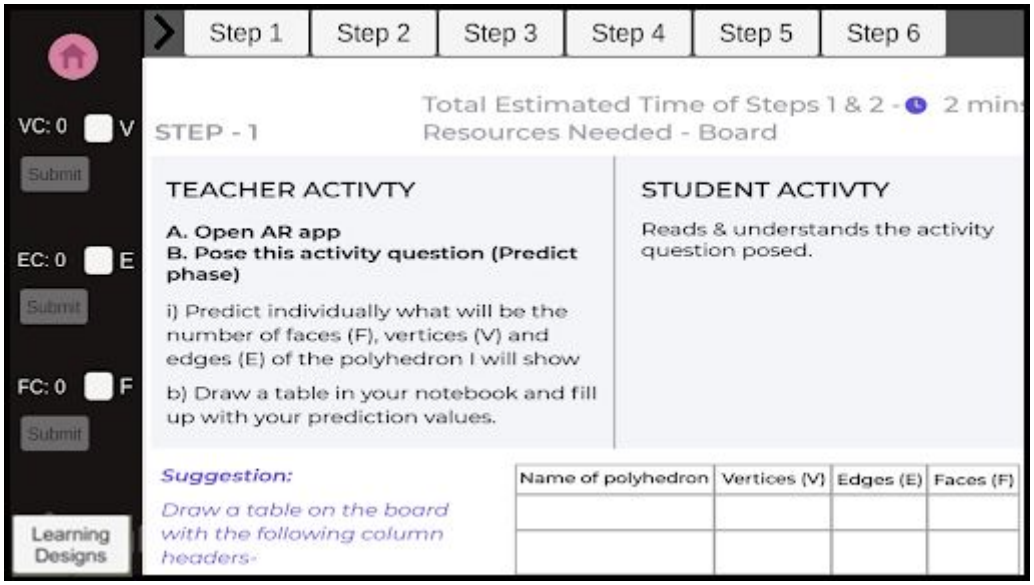


Figure 4: Screenshot of constructively aligned Learning Design with AR

- After selecting the learning objective, you will get a stepwise representation of the Learning Design on how to perform an activity in the classroom/laboratory (Fig.4).
- Click on the numbered tabs that correspond to the sequence of steps in the learning design.
- During your class i.e. at runtime, you can swipe the learning design in and out of your screen as you want. To do this, simply click on arrow button present at top left of the screen, just beside the Home button (Fig. 4).

3D VIEW APP

Step 1 - Select the 3D house model from the main menu.

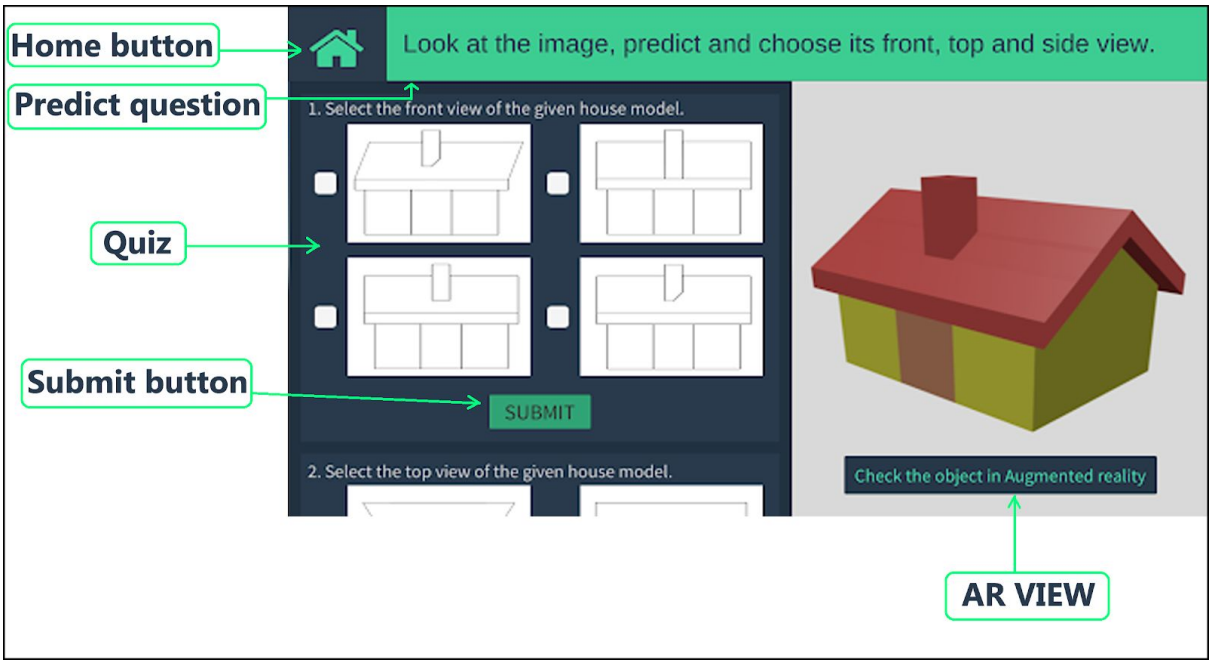


Figure 5: Screenshot of predict quiz.

- After selecting the house model, you will see the activity question which is, predict the top view, side view and front view of the house model.
- Attempt the following quiz and save your answers.(fig. 5)

- **AR VIEW -** press the AR view button to observe the 3D model of the house in AR.

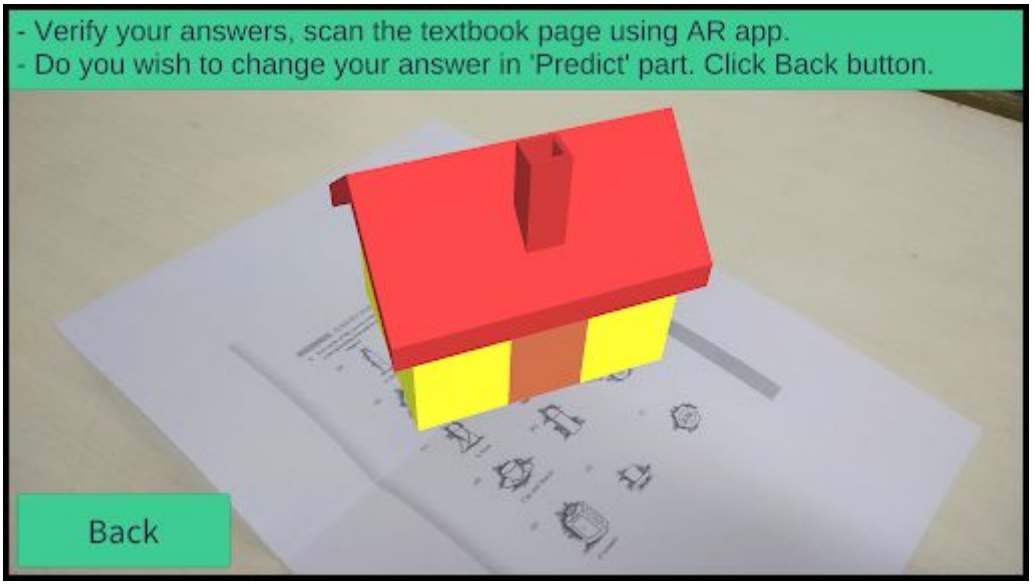


Figure 6 : Screenshot of house model in AR view.

- Point the camera on page 157 in any NCERT Class 8 Mathematics textbook (The page functions as the marker). (Fig. 6)
  If you do not use NCERT textbooks, you can download the marker from ‘Resources required’ in the webpage.
- Now you can see the 3D model of house augmented over the textbook page (Fig. 6).
- Use two fingers together to rotate the 3D model and view it from different angles.
- Now press “Back” button and check if you want to change your options.
- Submit your answers and get the feedback.