*Purpose of using Augmented Maths*

Empowering teachers to teach 3D visualization of polyhedrons using Augmented Reality in classrooms or laboratories.

‘Augmented Maths’ has 3 unique features that sets it apart from other AR apps.

1. It makes the textbook come alive for your students. Students can see the 3D projections of the geometrical shapes, simply by scanning their NCERT Maths textbook page (currently Class 8, Chapter - Visualization of 3D solids).
2. Your students & you can interact with these 3D shapes – rotate them, tap to count the vertices, edges and faces.

Teachers using the app have asserted that the app effectively addresses the student difficulties in understanding the above concepts and then apply them to derive the Euler’s rule.

3. You can use the student-centred, constructively-aligned lesson plans in-built within the app. You can choose the lesson plan to maps to your HOTS learning objective.

See the video below for a demonstration of the 'Augmented Maths' app.

Immersive teaching & learning of Euler’s rule for polyhedrons

<https://youtu.be/Ws41T48u4e8>

*Resources Required*

* Android phone or tablet (with 4GB RAM) that has operating system Android 4.0 onwards
* Augmented Maths.apk file [here](https://github.com/nexteducationrlab/Augmented-Maths.git)
* Class 8 NCERT Textbook

In case you do not use NCERT textbooks, you can download the marker here:

* + Augmented Maths (@Balraj: Uploaded in GDrive folder)

Download ‘Augmented Maths’ app

* Click on the hyperlink below to download the following app in your mobile phones or tablets:
* Augmented Maths (@Balraj: Uploaded in GDrive folder)
* Keep Pg. 165 open from Chapter 10 : Visualizing 3D solids in NCERT Class 8 Maths textbook.

In case you do not use NCERT textbooks, you can download the marker here:

* + Augmented Maths (@Balraj: Uploaded in GDrive folder)

Install Augmented Maths

<No change, as it is currently>

How to use Augmented Maths

Scroll down the ‘User Manual’ to get stepwise instructions on using the ‘Augmented Maths’ app

<User manual pdf, @Balraj - check in drive>

Additional resources [@Balraj - new menu option on the left panel]

Click on the following buttons to access useful resources based on the ‘Augmented Maths’ app :

o Teacher's corner: If you are a teacher.

o Researcher's corner: If you are a researcher.

o Developer's corner: If you are a developer.

* Teacher's corner

Content: Lesson plans for teaching with ‘Augmented Maths’

Learning Objective 1: Students will be able to derive the Euler's rule from their observations of given polyhedrons (Inquiry)

Learning Objective 2 : Students will be able to apply Euler's rule to find number of faces, edges and vertices of a given polyhedron (Problem solving)

@Balraj : Give 2 different pdfs the way given in GVG page, they should open in a separate tab when clicked. The PDFs are uploaded in drive ( LO1.pdf, LO2.pdf).

* Developer's corner

Content: Github link to Augmented Maths code

INTRODUCTION

You can develop Augmented Reality application using Unity 3D software, which is a game development platform, using scripting language such as C#. The application marker card triggers the 3D model.Vuforia Portal is used to create licence key for the application and to create the database of an image target. The image is recognized and tracked by the application installed in the mobile/ tablet device. One can extend the code to include other features and improve the effectiveness of this application.

RESOURCES REQUIRED

Github link : <https://github.com/nexteducationrlab/Augmented-Maths.git>

Researcher's corner

Pilot studies are in-progress with Mathematics teachers to study the effective learner-centred way of integrating Augmented Maths in teaching, given the context of the Indian classrooms.

We are also engaged in identifying the design impediments teachers face while designing student-centred learning activities with Augmented Reality, in general and the type of scaffolds to provide so that teachers can overcome these impediments.

If you want to contribute to our research, you are welcome to email us your lesson plan for teaching with Augmented Maths at nexteducationrlab@gmail.com