

Google Summer of Code Proposal

Basic Details:

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- **Your first language:** English
- **Location and Timezone:** India, IST (UTC +5:30)

Introduction:

I am a final year student pursuing a bachelor's in computer science and engineering with a passion for education and teaching. Sugar Labs' commitment to providing educational tools for children resonates with my personal experience as a mentor. I have actively contributed to Sugar Labs, focusing on migrating activities and enhancing functionality. My skills include full-stack development, where I have built real-time applications and deployed them successfully.

Contribution to Sugar Labs:

I have made significant contributions to Sugar Labs, with 25 pull requests merged. Notable contributions include:

- [Migrating 17 activities from webL10n to i18next](#)
- [Added pause functionality to Blockrain](#)
- [Change hover effect on popup items for v2](#)

Project Details:

Sugarizer 3D Volume Activity:

What are you making?

I propose to develop a new Sugarizer activity called "Sugarizer 3D Volume" that aims to facilitate learning about volume using 3D dice simulations.

How will it impact Sugar Labs?

This project will enhance the educational resources available within the Sugar Labs ecosystem by providing a visually engaging tool for exploring volume concepts. It will offer interactive features such as volume manipulation, color customization, and collaborative sharing, fostering active learning and collaboration among students.

What technologies will you be using?

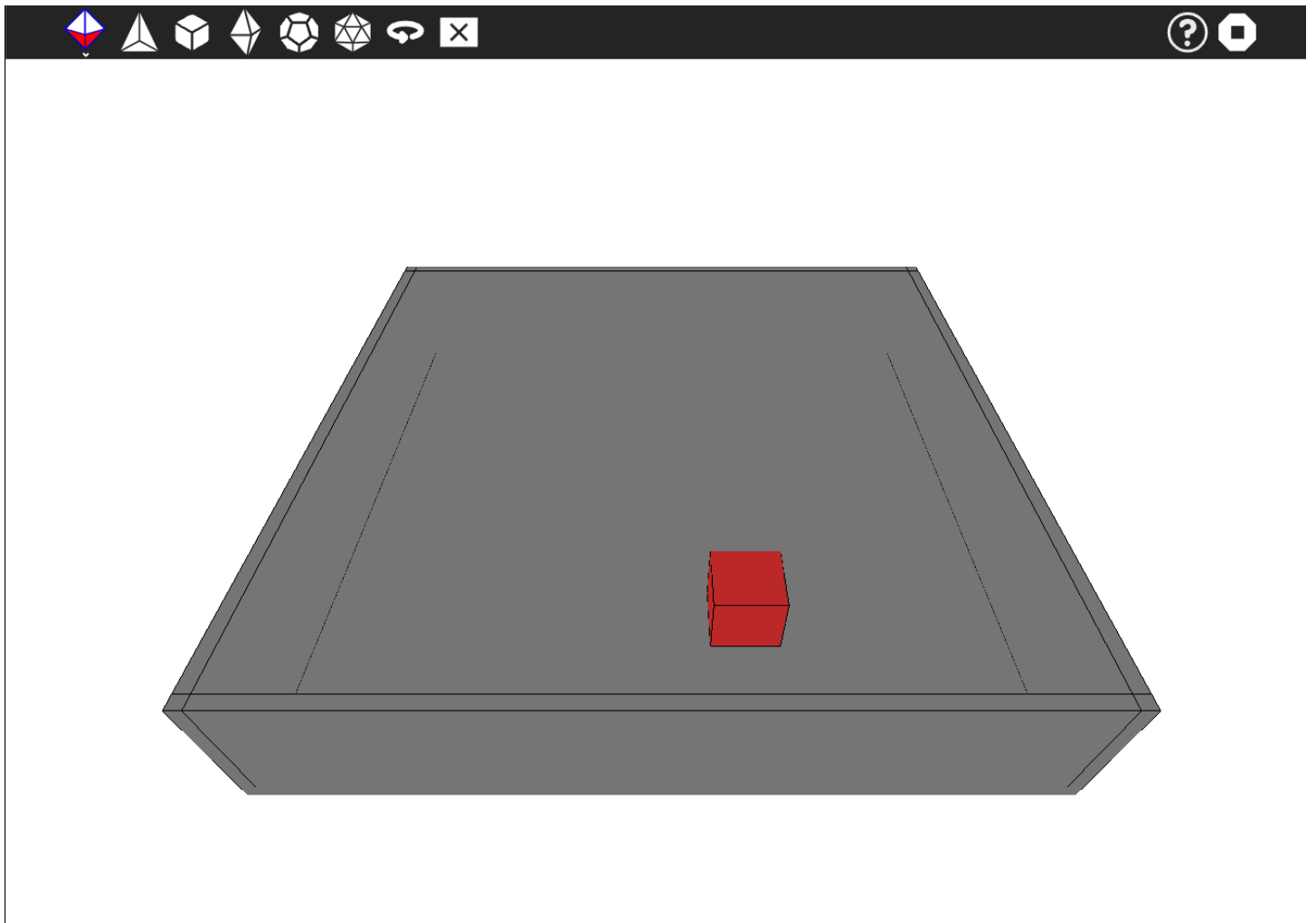
For this project, I will utilize Vanilla.JS mainly. Additionally, I will leverage a lightweight and open-source 3D JavaScript called Three.js for the 3d object rendering. Along with it I will make use of cannon.js for the physics. The activity will be lightweight and interactive.

Implementation:

The implementation of the Volume activity will follow Sugarizer's design practices, ensuring an optimal learning experience for children. It will feature an interactive board where students can explore volume concepts using 3D dice simulations.

The activity will allow users to manipulate volumes, customize their appearance with different colors and transparency levels, and even simulate dice rolls to add a fun math perspective. The board will support intuitive interactions, such as zooming in/out and rotating, making it easy for students to engage with the content. Additionally, the activity will leverage neighborhood support, enabling collaborative learning experiences among users. With features like customizable playmats and shake board functionality, the Volume activity aims to make learning about volume both educational and enjoyable for young learners.

Current Progress:



A mockup/ demo version of the activity has been created, where basic functionality and a early look is showcased. The user can insert various volumes in the cube, which have physics applied to them and fall to the ground and roll on collision. Volumes can also be deleted from the board. Rotation of the board is also allowed by using the rotate button. Ability to look around using the mouse was tried but proved to be unnecessary. This prototype serves as a base for understanding the requirements properly, and a good way to communicate my vision of the activity.

A video demo of the activity is shared below, along with a live deployed version of it.

Video: <https://youtu.be/4lo7s9a761Q>

Live Website: <https://gsoc-volume-demo.vercel.app/>

Timeline:

Community Bonding: May 1-26

- Get to know the mentor, clarify any sugarizer development-related doubts.
- Make changes to the proposed timeline and plan further actions.

First Week:

- Make a todo/tasks to be done list.
- Work on the existing demo and finalize activity structures and functionality.

Second Week:

- Develop functionality to display volumes using 3D dice simulations for different volumes using Three.js and cannon.js.
- Develop the remove object functionality.

Third Week:

- Work on developing neighborhood support.
- Plan ahead for any changes in the activity.

Fourth Week:

- Develop view functionalities, such as zoom in and out and rotate board feature.

Fifth Week:

- Add volume customization such as semi-transparent, with and without number.
- Add playmat customization functionality with friction.

FIRST EVALUATION

- A working activity should be done by this point, with core functionalities. This should serve as a base for the second part of the programme, and to receive critical feedback.

Sixth Week:

- Implement the shake board functionality using a button.
- Implement shake board functionality using an accelerometer.

Seventh Week:

- Implement calculating the sum of dices when there are numbered dices included.

Eighth Week:

- Continue working on neighborhood support and implement buddy colors and color customization.

Ninth Week:

- Localize the activity in multiple languages.
- Add a tutorial to the activity including localization.

Tenth Week:

- Perform thorough testing, debugging, and optimization of the activity. Prepare final project report and documentation.

Eleventh Week:

- Finalize the project and buffer time for any changes.

Twelfth Week:

- Submit final work product and final mentor evaluation by August 19, 18:00 UTC.

Availability:

I can dedicate 15-18 hours a week for this program. I do not have any days off planned as of now. I will be in contact with my mentor through the preferred communication channel. A weekly follow up will be maintained to check up on progress, and discuss any difficulties while developing the activity.

Post GSoC, I will be willing to contribute to SugarLabs whenever I have the time to do so. Their mission really resonates with me. This allows me to utilize my time contributing to some cause, while constantly learning.