

GSoC '20 Project Proposal

(New Science themed Activities)

Basic Details

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Github: [saumyaprakash30](https://github.com/saumyaprakash30)

First language:

My first language is Hindi and I can also speak and understand English.

Location and Timezone:

Location: Chennai, Tamil Nadu, India

TimeZone: UTC +5:30 (Indian Standard Time)

Share links, if any, of your previous work on open source projects

This is my github link [saumyaprakash30](https://github.com/saumyaprakash30). Here you can see my projects mainly based on application developments. Most projects were group projects and some are personal small projects for learning.

Convince us that you will be a good fit for this project, by sharing links to your contribution to Sugar Labs

I am comfortable writing codes in python. I work on application based projects which were written in python using wx and in java . So I have a clear idea how to work on these types of projects.

I create an activity named [ToDo](#) which is present in my repo. I found that it is already in javascript named getThingsDone. Currently working on game activity (similar to Jardinains for pc).

I am comfortable with `sugar-toolkit-gtk3` and packaging the activity

Project Detail

What are you making:

The aim of this project is to create 10 science based activities. As we know that Sugar is FLOSS learning platform for children so there should be fun science activities which help them learn basic science which include Physics , Chemistry and Biology activities.

I went through the topics which are currently being studied by grade 1 to grade 10 students and I made a list of 10 science themed activities .

1. My Body

This activity is about the human body System like digestive system, respiratory system, Nervous System, Excretory system and reproductive system .

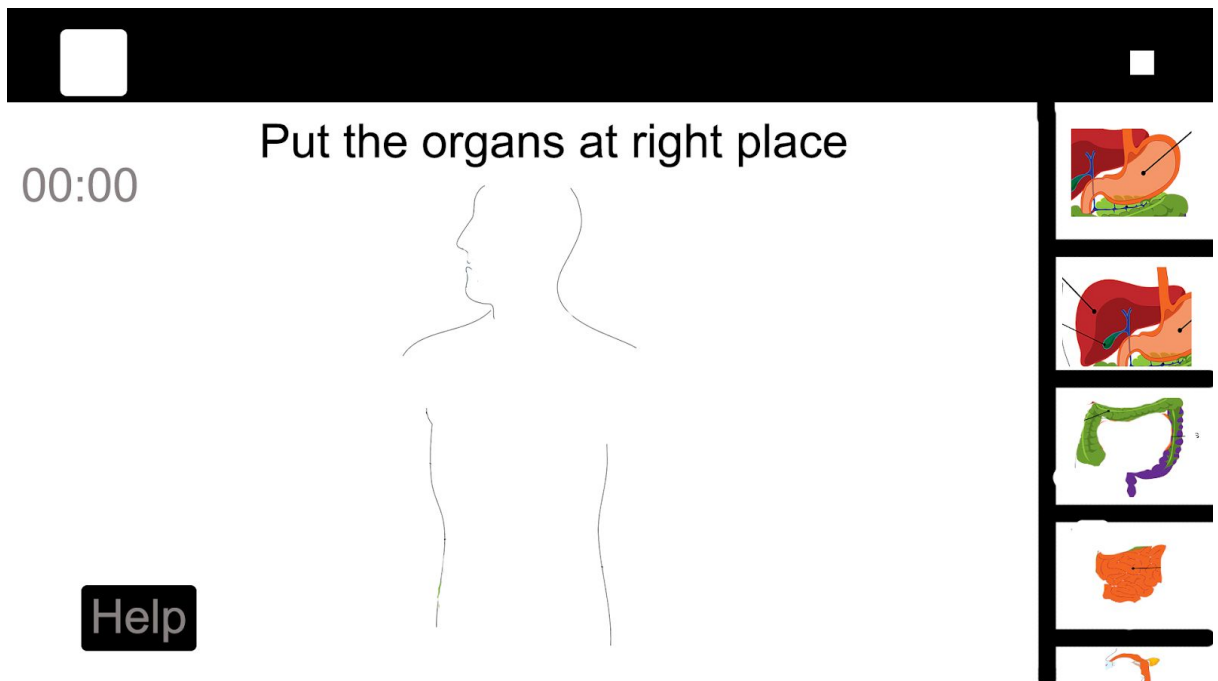
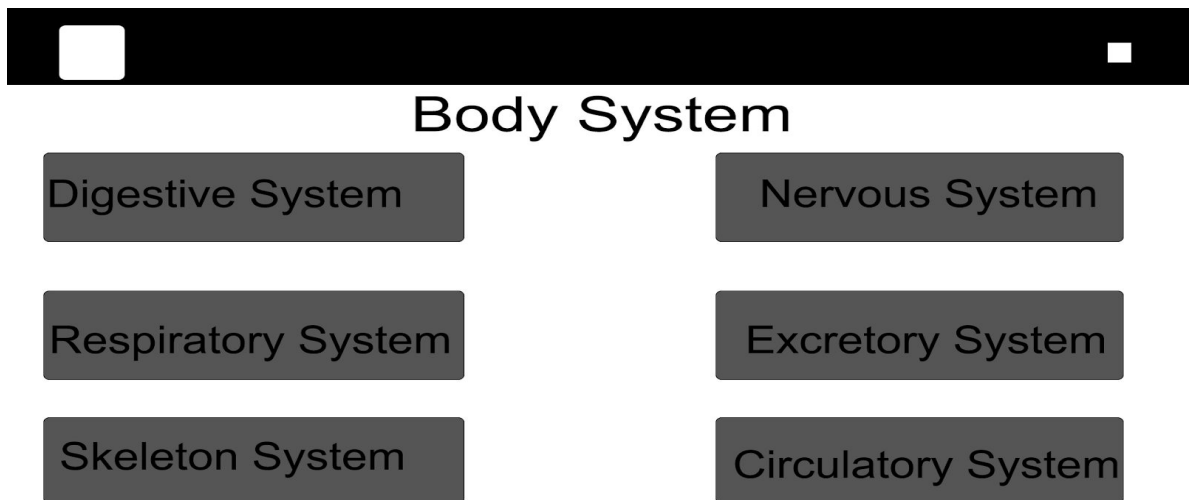
In this activity, first the student will choose the body system then they will learn with the help of labeled diagram of the respective human body system. Every label will be clickable

where there will be information about that organ. This will be shown right part of the screen.

Also there is a game where students will apply their learning.

About the Game: Students will put the organs at the correct location to complete the challenge. Journal will save the best time.

Here are the sample image of activity how it will basically look:



Same for all the other human body systems.

2. Plant

This activity is about plants, fruits and flowers. This activity will be similar to My body activity. Instead of different body system buttons there will be options of Plant, Tree, Fruit and Flower.

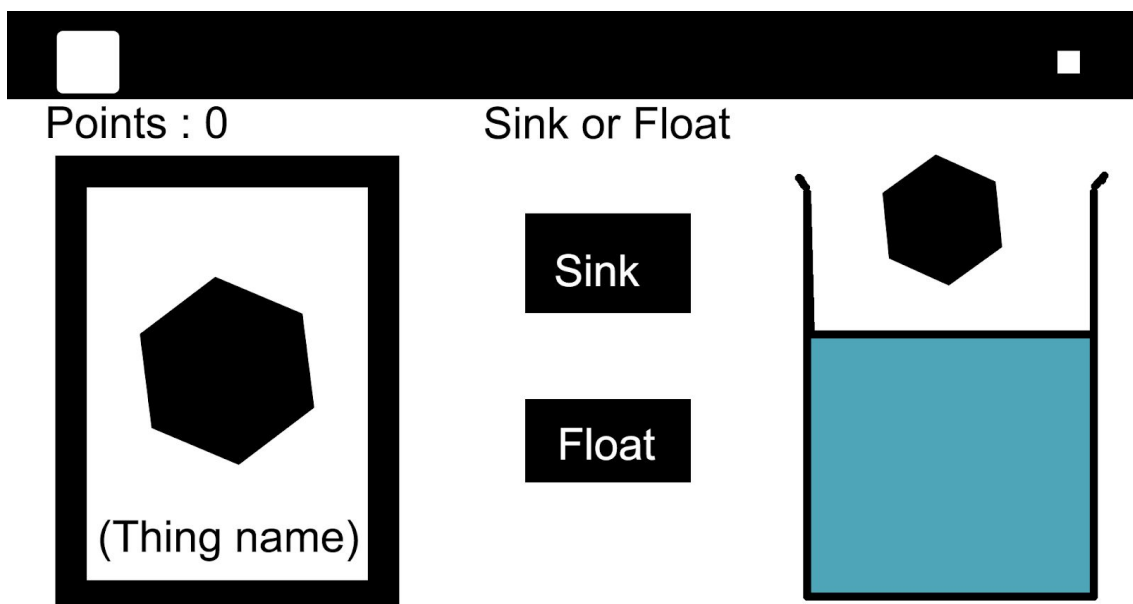
About the game : same as My Body.

Additional: There will be information about growing a plant where they learn how plants grow and how they will grow plants from seeds.

3. Sink and Float

This activity will help students to learn about which items sink or float in water. This activity is mainly for grade 1 or grade 2 students.

It will be a game activity where as shown below in fig. the hexagon represents an item and the student will choose whether it will sink or float . This game will be points based. There will be small animation whether it will float or sink. The number of items we will be around 10 (discuss later). Journal will save the high score.



4. Recycle

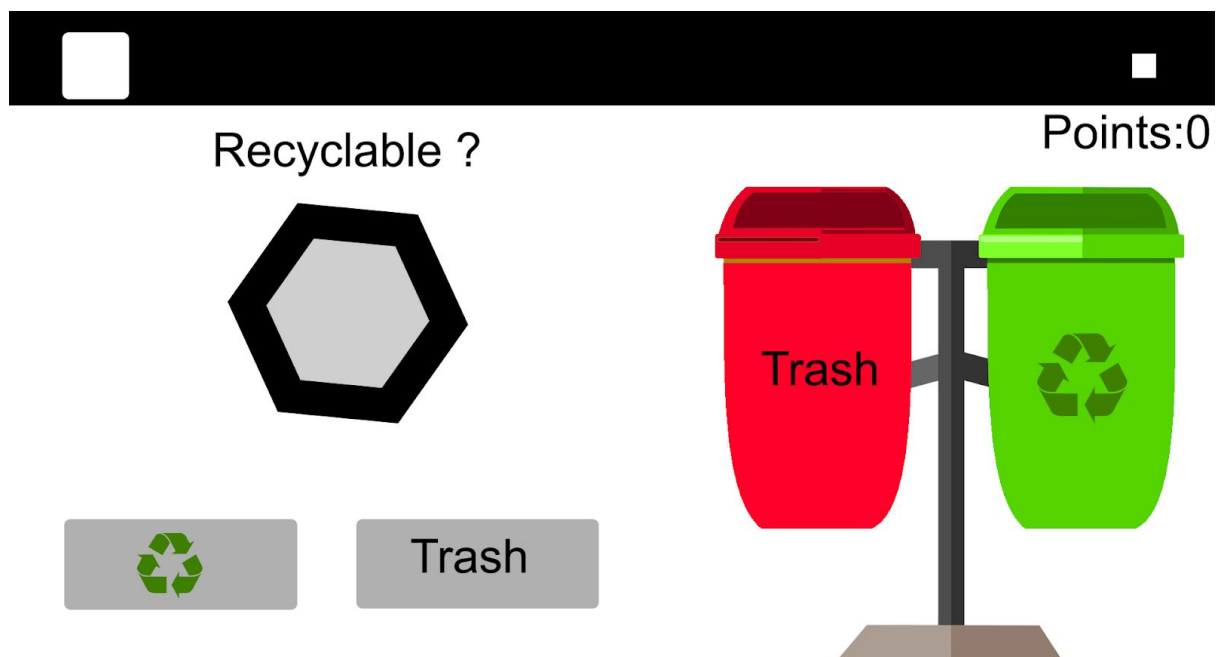
This activity will help students to learn about which items are recyclable and which are not. This activity is for grade-2 students.

At start there will be information about recyclable items. Then there will be a game where students will select whether the shown item is recyclable or not.

Here Dustbins were the buttons and they will click on which dustbin it belongs to. (there will be slight change in image shown below)

As shown in figure, hexagon represents an item and students will select recyclable or not.

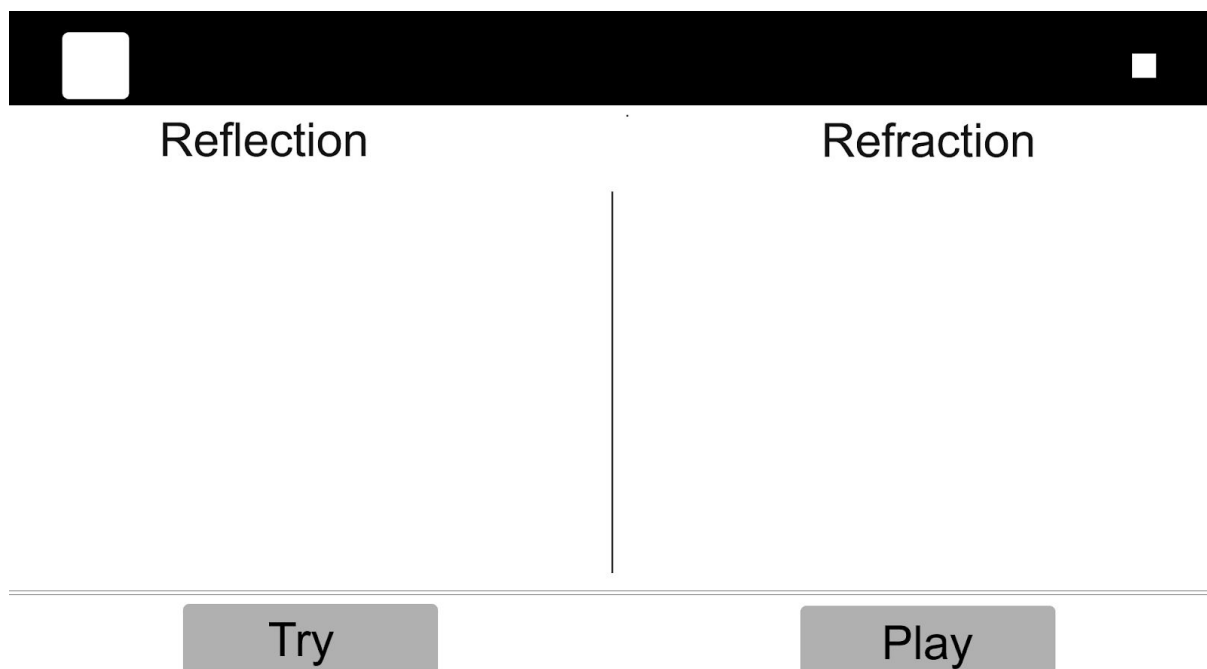
This will be a point based game. Journal will save high scores.



5. Light

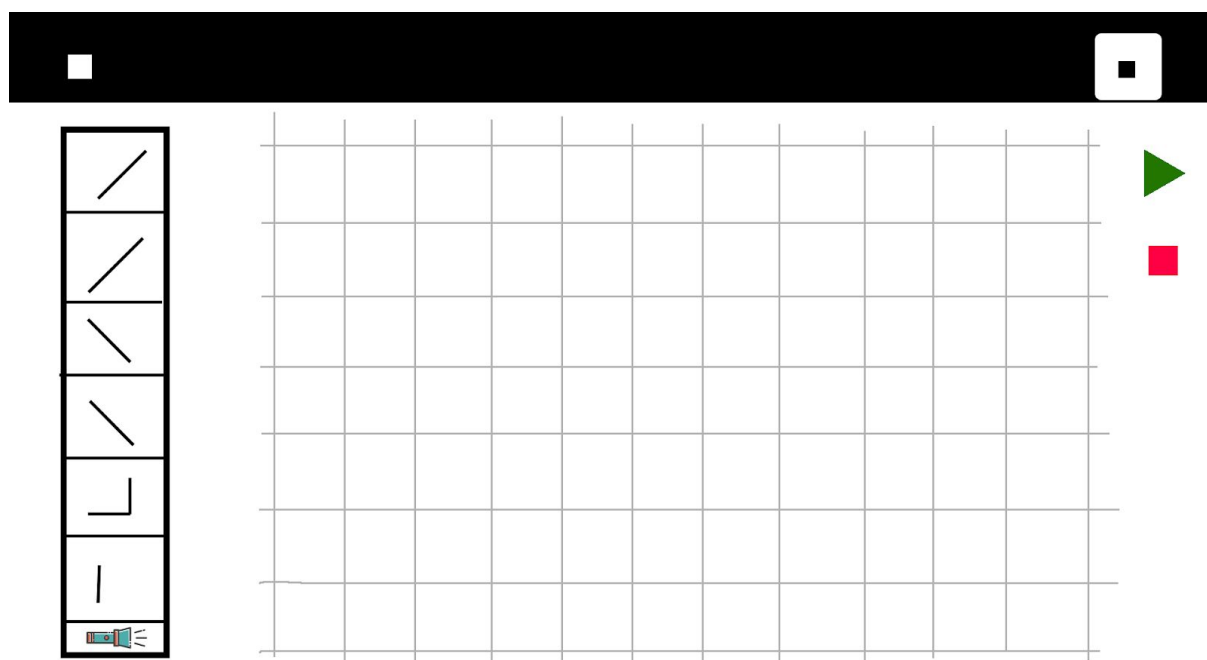
Here students will learn about reflection and refraction of light. This activity is for students of grade 6 - 8 .

In this activity, firstly there will be information about reflection and refraction similar to shown in figure.



This activity include **Try** and **Play** option.

In Try mode : In this activity, student will simulates the light ray by putting the components like torch and mirrors and play around to change the direction of light ray. The sample image for activity is shown below:

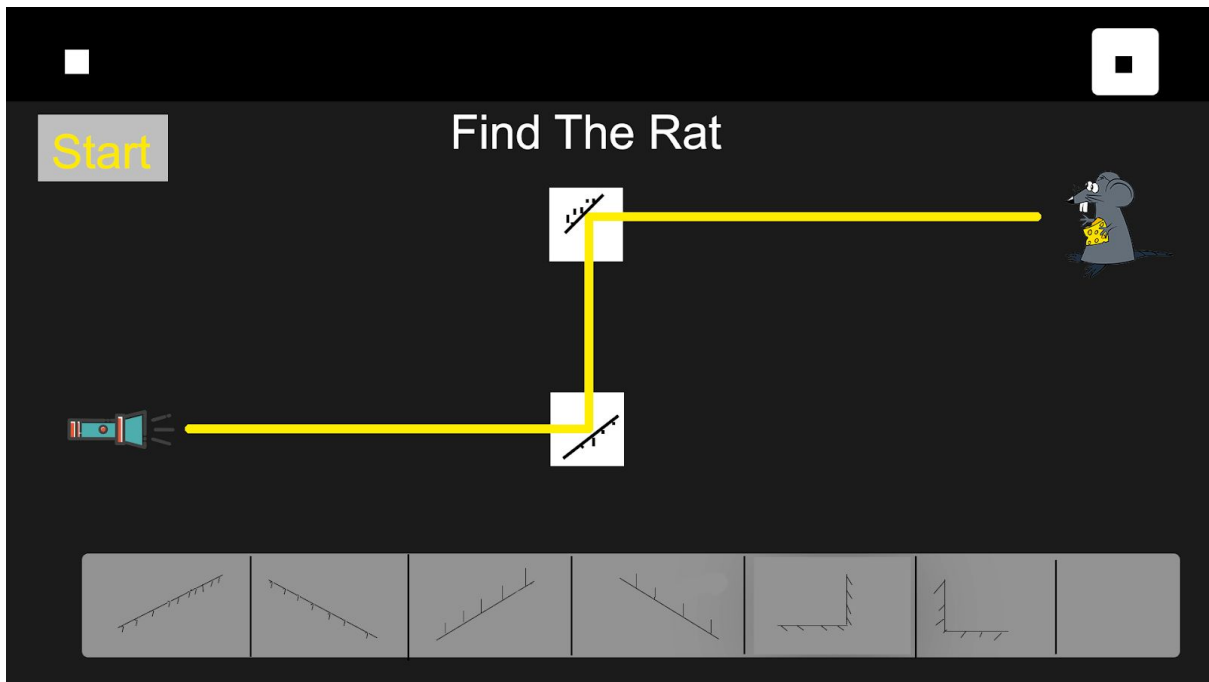


In the leftmost column, there are different angled mirrors where they can be used to change the direction of light rays. When the play button is clicked the torch will emit light rays and

go as the components are placed. Start Button will change to stop button. There will also be reset button which clears the grids.

In Play mode: In this activity, there is a game called **Find the Rat**.

As shown in the figure below you have to place the correct item (like angled mirror) in the white box such that torch light beam reaches to rat.



Start button will start emitting the light beam from the torch. Here it will be checked whether you paced the right component at the right place or not.

There will be different 5 stages with increasing difficulty.

6. Circuit

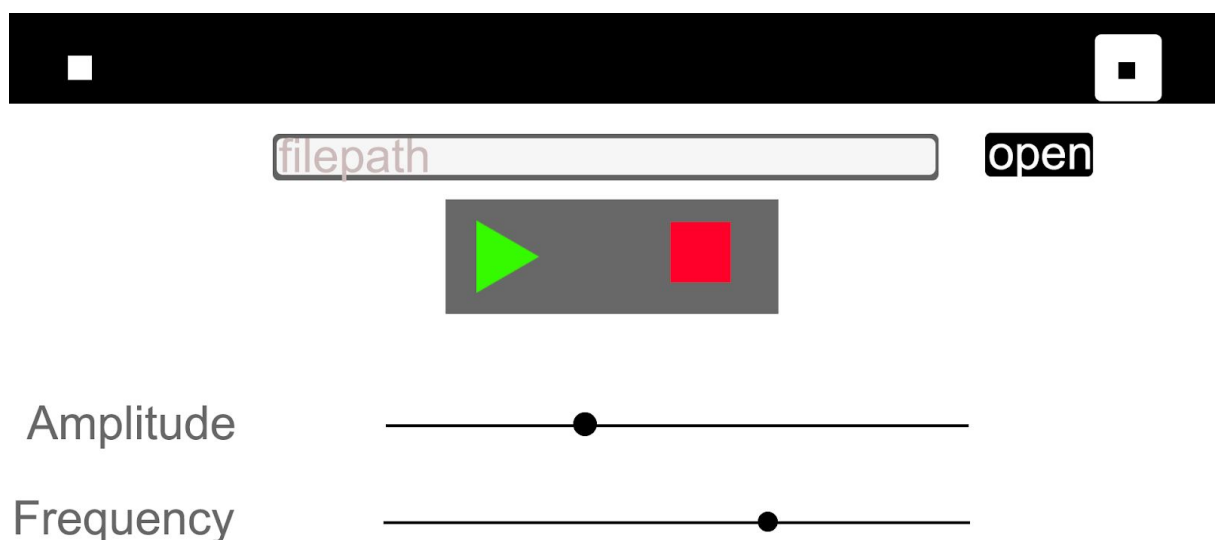
In this activity, students will learn about basic electrical components (like Battery, cell, connecting wire, bulb etc). Firstly there will be an introduction to all above components.

This activity includes simulation similar to **Light** activity's Try mode. Instead of mirror components there will be electrical components . After completing the circuit by placing the components will simulates the circuit by pressing start button.

About game: similar to **Light's** activity play mode .
Instead of mirror component there will be electrical component.
In the game, there will be circuit of cell, connecting wires and bulb. So they have to complete the circuit by clicking on grid cell which make portion of wire to rotate. Correct combination of all will result in glow of bulb..0

7.Sound

In this activity, students learn about the Sound. As shown in the figure there will be a music player with option to change the value of amplitude or frequency and notice the change in sound.



8.Atoms

In this activity, students will learn about atoms and molecules. Firstly there will be an introduction to atoms which includes info about electrons, protons, periodic tables too.

This activity includes a periodic table with every cell carrying information about the element.

9. Degradables

In this activity, students will learn about biodegradable and non-biodegradable materials. This activity will work similar to Recycle Activity. There they will choose whether the shown image is biodegradable or non- biodegradable.

10. Beaker

In this activity, students will simulate chemical reactions / Mixing chemical between acids, bases, metals, salts etc. As shown in image below, there is a beaker where all the reactions take place. There is a burner below the beaker and lid above that beaker. Students will choose chemicals from the leftmost column and it will be added to the beaker. Chemical color will change as it changes in real world.

How will it impact Sugar Labs?

All the above activities will help students to learn about basic fundamental science topics which every child must know. This is important for Sugar Labs to have these kinds of activities. All activities are interactive which make students learn and understand faster.

What technologies (programming languages, etc.) will you be using ?

Python :This project mainly involves coding in **python** with `sugar-toolkit-gtk3` and `pyGame` libraries.

Inkscape :for logo design.

Timeline

June 1 - 12	My Body activity <ul style="list-style-type: none">● Mentor discussion● writing logics for game(same logic for all system will be used)● Image acquisitions● Same for every body system
June 13 - 17	Plant Activity <ul style="list-style-type: none">● Mentor discussion● Similar logic to My Body activity● Image acquisitions● Plant,fruit,flower,tree and seed activity
June 18-20	Sink and Float Activity <ul style="list-style-type: none">● Mentor discussion● Image acquisition● Writing logic● test
June 21-23	Recycle Activity <ul style="list-style-type: none">● Image acquisition● Writing logics
June 23-25	Degradable Activity <ul style="list-style-type: none">● Image acquisition● Writing logics
June 26-27	Discuss final changes with mentors before releasing the activities.

First Evaluations

June 28 - July 11	Releasing 5 activity Light Activity <ul style="list-style-type: none">● Mentor discussion● Intro design● Try activity design● Play activity design(20 stages)
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July 12 - July 25	Circuit Activity <ul style="list-style-type: none"> • Mentor discussion • Intro design • Try activity design • Play activity design(20 stages)
July 26 - 27	Discuss final changes with mentors before releasing the activities.

Second Evaluations

July 28 - Aug 12	Release Light and Circuit activity Beaker Activity <ul style="list-style-type: none"> • Mentor discussion • Finding equations and properties in reactions. • Designing activity
Aug 13 - Aug 17	Atom Activity <ul style="list-style-type: none"> • Mentor discussion • Intro design • Periodic table design
Aug 18 - aug 24	<ul style="list-style-type: none"> • Entire work review • Documentation • May include work suggested by mentors • Final submission • Review form community and discuss on issues given by them

How many hours will you spend each week on your project ?

My summer vacations are starting from May 2 to July 26 as given but may change due to the Covid-19 pandemic (mostly it will not). In that period I can give about 45-50 hrs per week. When my college starts, I will manage to give 35-40 per week (more on weekends).

There is no other commitment in vacations. So I will give my full to Gsoc.

Discuss your post GSoC plans. Will you continue contributing to Sugar Labs after GSOC ends ?

Yes, I will love to contribute to sugar labs as there are lots of activities which need to have an upgrade. I will also try to build Machine learning based activities where students learn about ML.