Animation in Cell Biology

Summary

The project focuses on the front-end side and provides a better interactive biology learning environment for students. By embedding interesting animations of the study materials and quizzes, the middle school students can be inspired and immerse into the interactive study environment. In addition, the students can know their learning situation immediately after the quizz. Dr. Walker and the legacy team transferred us the requirement of the customer including 12 slides folders and defined what kind of animation needs to be implemented.

In the beginning, we executed all the slides and listed three different kinds of bugs needed to fix. Distributing the tasks followed the type of bugs and each team member took over at least one slide. Everyone implemented the animation of slides locally and deployed them to the Stepstone environment. Because the customers have already established the Stepstone environment , which is a backend platform, we decided to test our application directly on the environment according to the user experience manually. One person is responsible for testing each application whether it fulfills the customers' expectation after merging to the Stepstone platform.

Team Roles

Scrum Master, Developer: Sri Charan Challa
Product Owner, Developer: Ming-Hsien Chien
Developers: Hao Yu Miao, Kunping Huang, Han-Hsien Huang, Chiou-Jiin Huang

Relevant Links

Pivotal Tracker: https://www.pivotaltracker.com/n/projects/2436121
GitHub: https://github.com/hanhsienhuang/BiologyAnimation
Demo Video Link: https://youtu.be/K2uw_y_J0-8
Poster Video Link: https://youtu.be/JpvkG9CGhhs
Deployment on StepStone: slide 3, slide 4, slide 8, slide 12, slide 14, slide 16, slide 31, slide 38, slide 46, slide 53, slide 63

Customer Meeting Summaries

Iteration	Meeting Time	Customer Meeting Summary
Iteration 0	2/20, 18:50	We met with Dr. Walker in the classroom and discussed the requirements of the project.
Iteration 1	3/4	On March 4, we received the customers' spec from Dr. Walker. The meeting with customers was canceled because of COVID-19.
Iteration 2	3/18	No customer meeting scheduled due to COVID-19, but we still meet the expectation of every iteration.
Iteration 3	4/7 14:00	We talked with professor Walker on 4/7. We asked for the instructions to deploy on StepStone. He then sent us the required information for deployment.
Iteration 4	4/28	Send Dr. Walker the demo slides which are completed by us.

Understanding of the legacy project

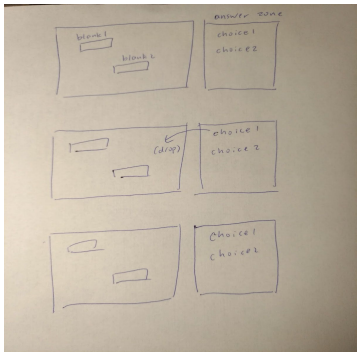
There were 12 slide folders in the legacy project. Every slide contained its own HTML and JS file. In addition, each slide still has some problems with animation and size. Therefore, we created 16 new user stories to solve them and established CSS files to increase the clearness and flexibility of our code.

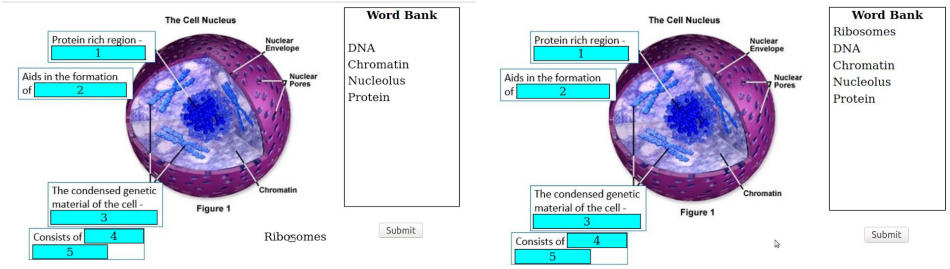
User Stories

We divided the slides into four groups. The slides in the same group have similar functionality and implementation. We wrote user stories for each group instead for each slide.

(Slides 8, 31, 38, 46, 53)

Feature: Choice returns when misplaced
As a student
So that I want an intuitive drag-and-drop experience
I want the choice to go back to the original position when it is dropped in an invalid place.



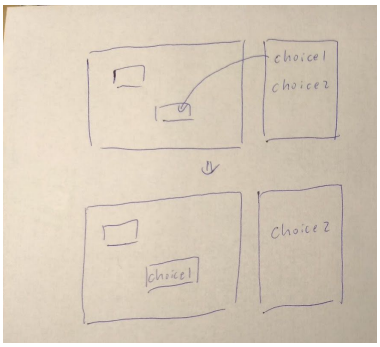


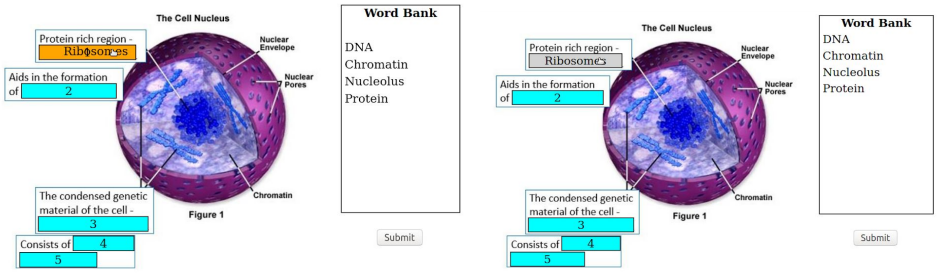
Feature: Fill in the blank

As a student

So that I can fill the answer in the blanks

I want the choice to be filled in the blank when it is dropped in the blank.



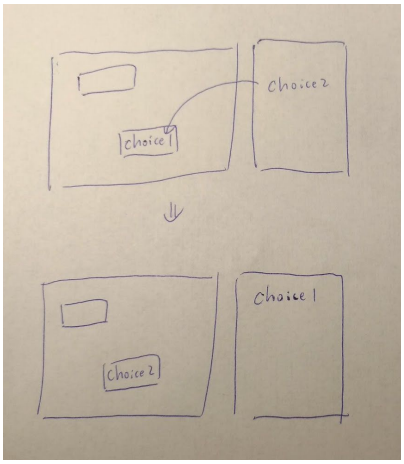


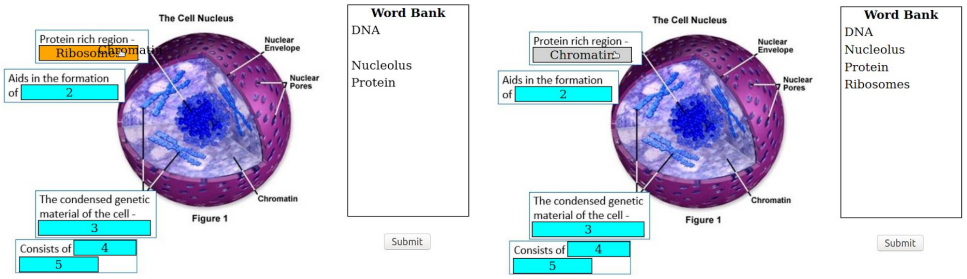
Feature: Replace the filled blank

As a student

So that I cannot place multiple answers into the same blank

I want to replace the old choice in the block with the new one, and the old choice goes back to the answer zone.



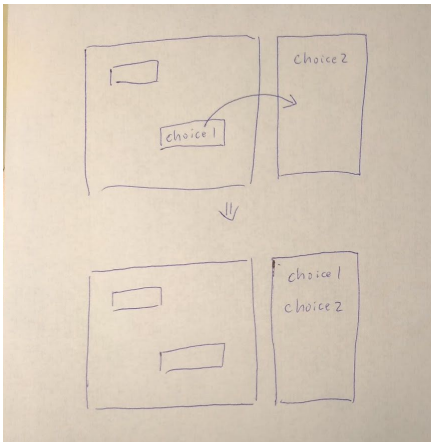


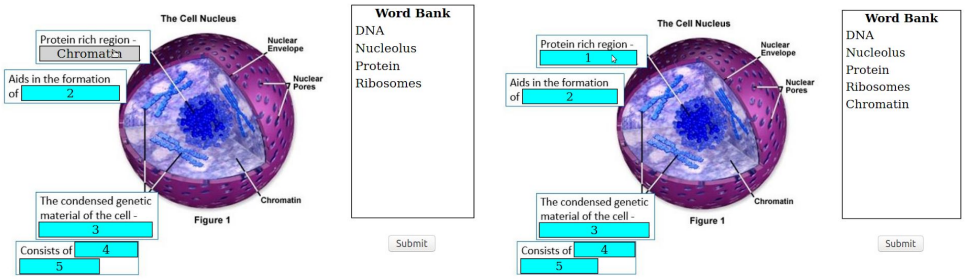
Feature: Cancel the filled blank

As a student

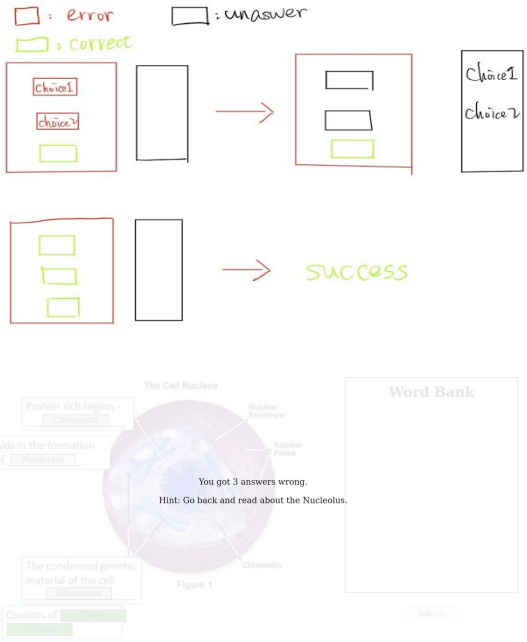
So that I can correct the answers filled previously

I want to be able to drag the choice in the block into the answer zone.





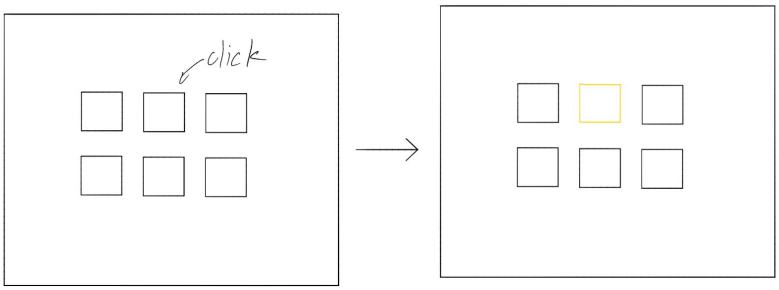
Feature: Submit the answer
As a student
So that I can submit and check my answer
I want the right answers to stay in the block and become green, and the wrong answers are reset and moved back in the answer zone.

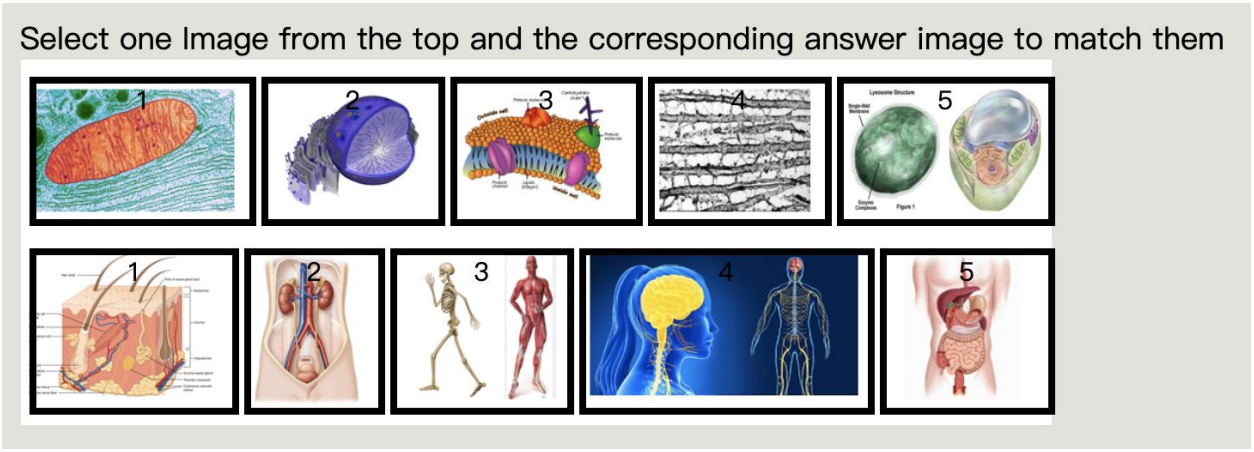


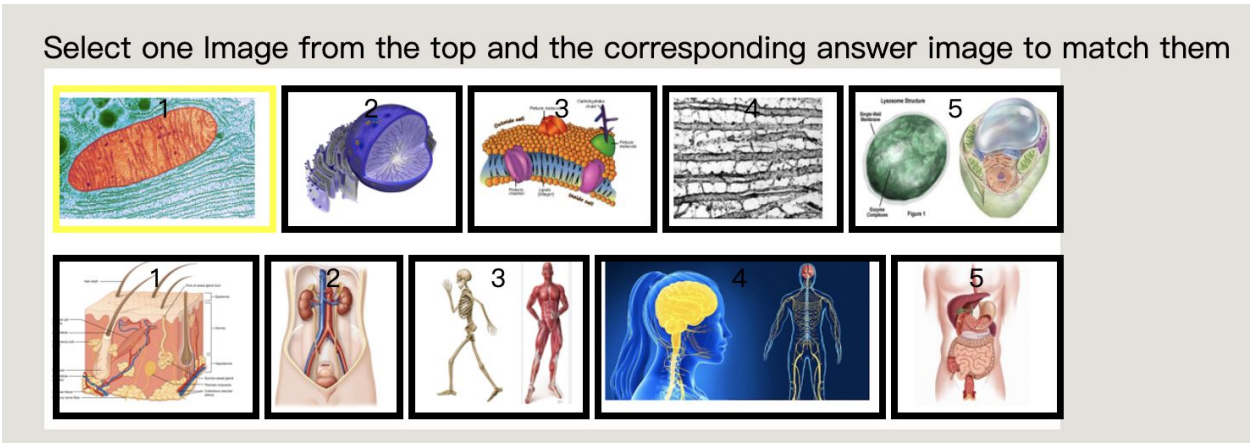
(Slide 63)

Feature Name: When an image is selected and is the only one selected, the border turns yellow - Implemented
1 point
As a student
So that I can identify the image

I want to have the image turn yellow when first selected

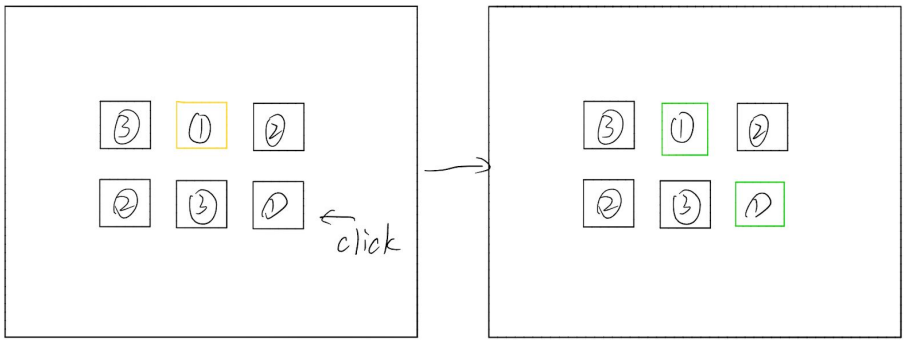


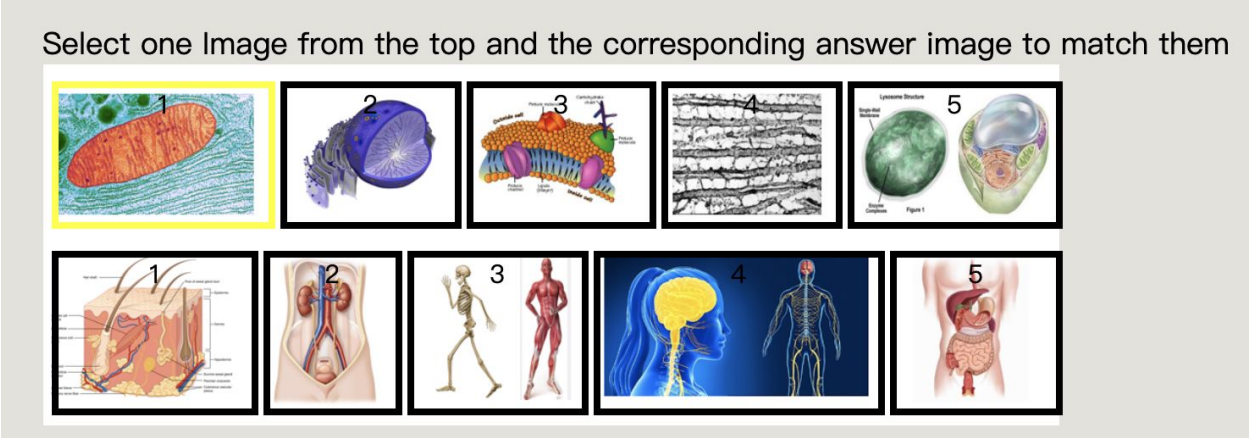


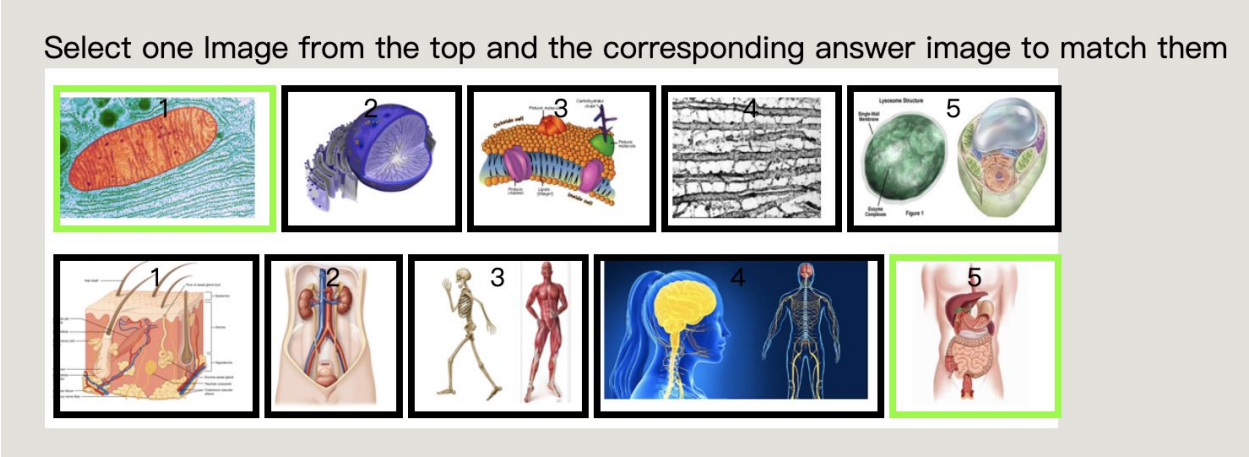


Feature Name: the border's color of matching images turn green - Implemented

1 point
As a student
So that I can identify the ones already correct
I want the matching images' borders turn green







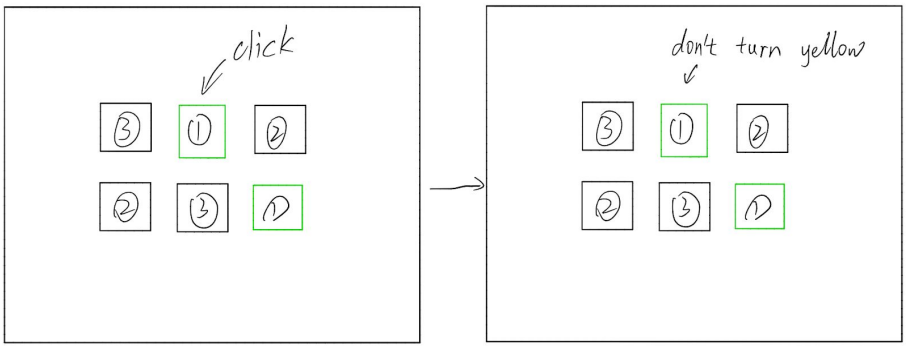
Feature Name: matched images should not be clickable - Implemented

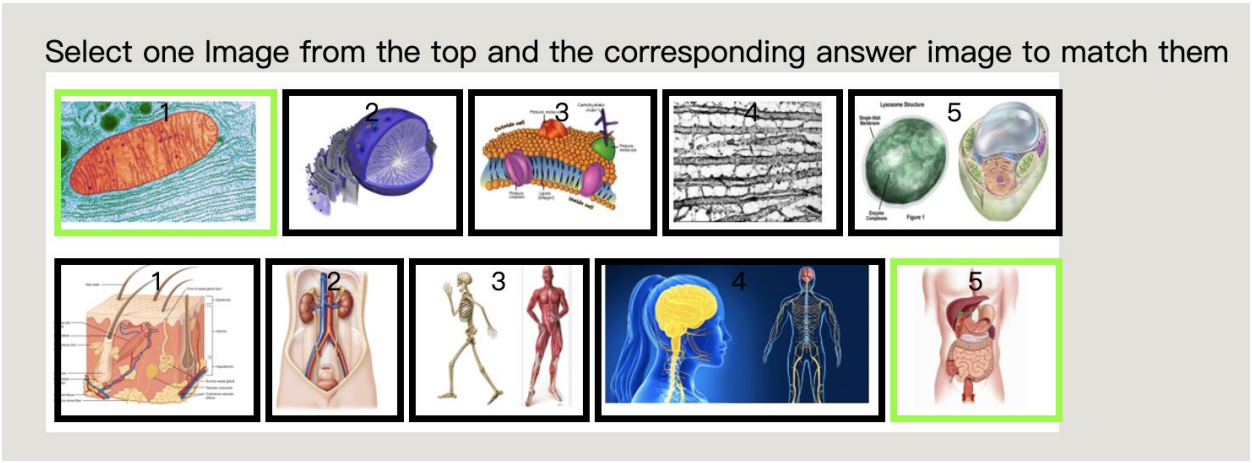
2 points

As a student

So that I will not misclick anything to cause confusion

I want the images matched be unclickable





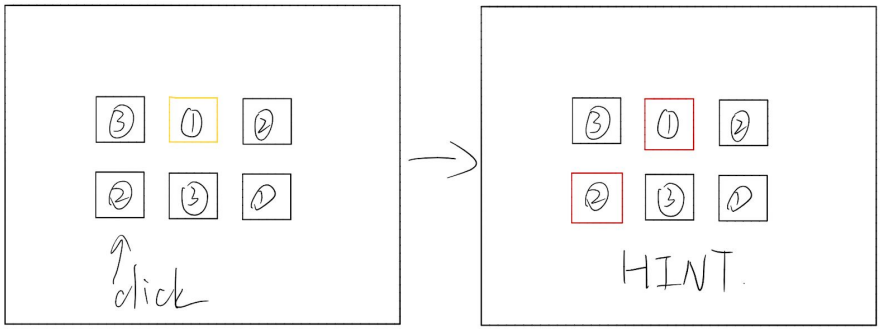
Feature Name: the color of non-matching images' borders turns red - Implemented

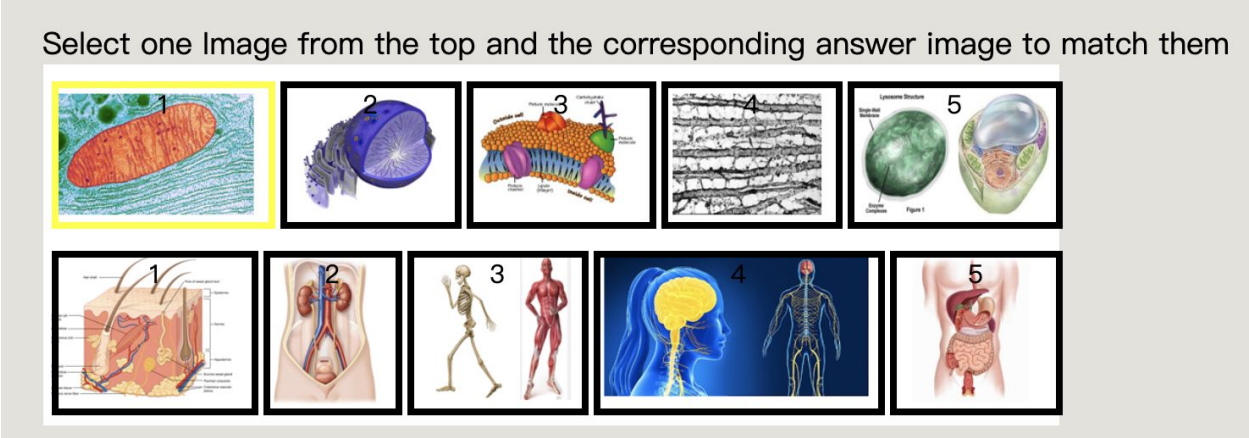
1 point

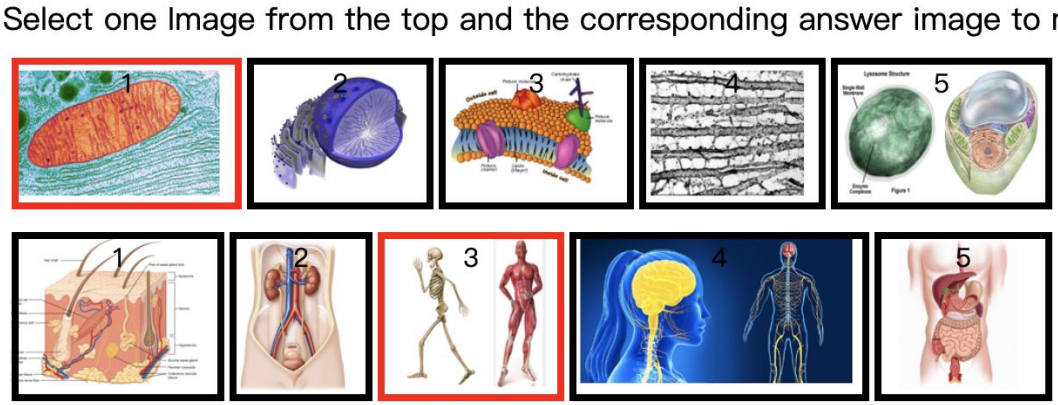
As a student

So that I know i should match other images

I want the non-matching images' borders turn red







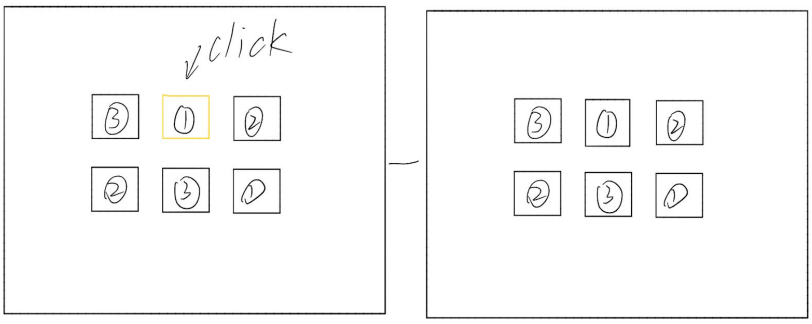
Feature Name: Uncheck the image - Implemented

1 point

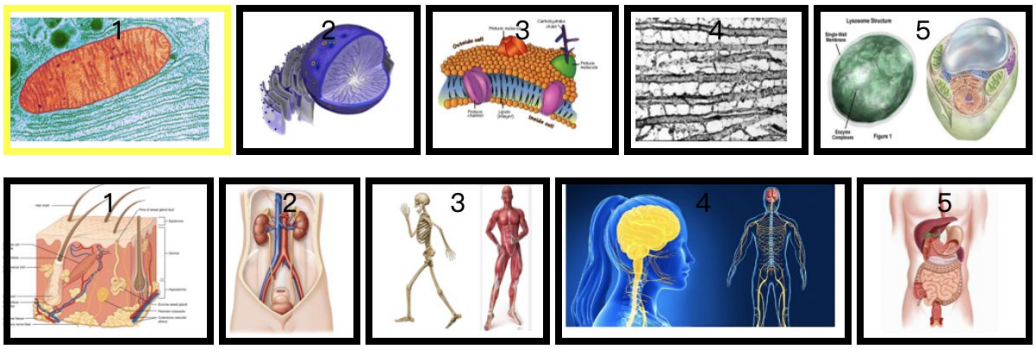
As a student

So that I can match the other two images while an image is selected

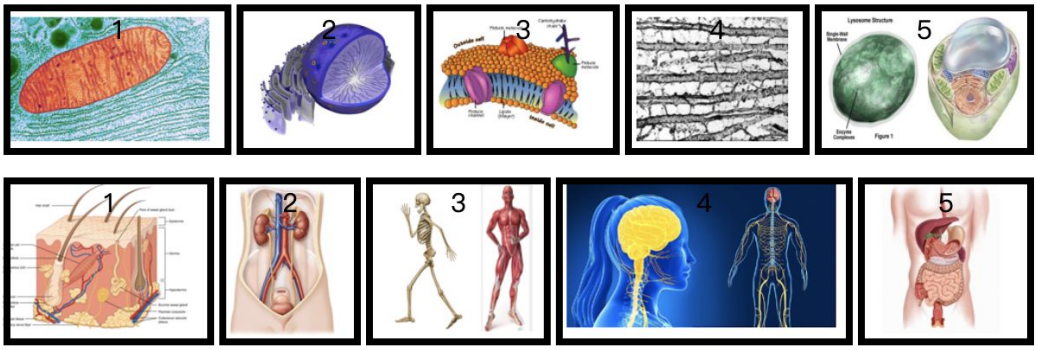
I want to uncheck the selected image.



Select one Image from the top and the corresponding answer image to match them

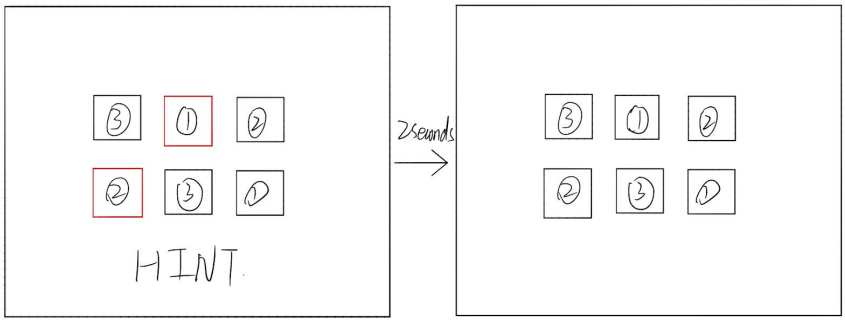


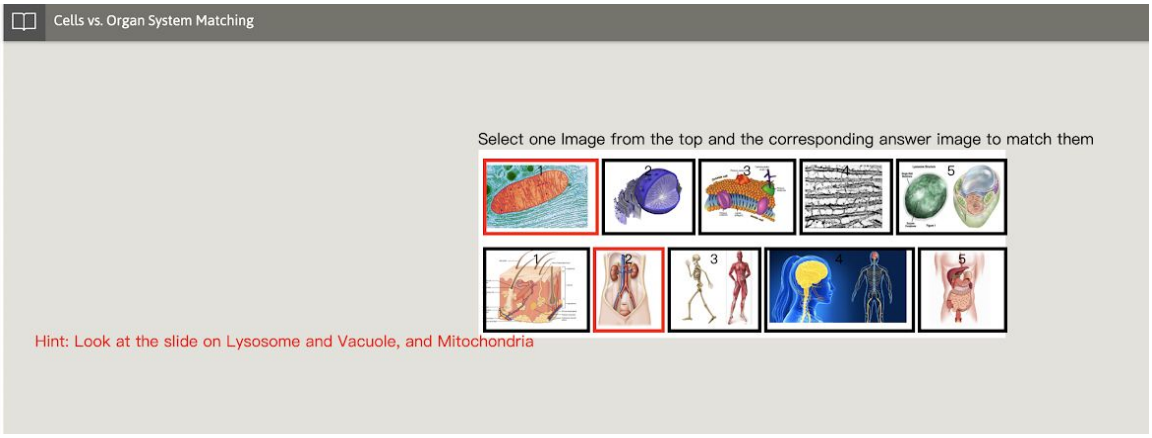
Select one Image from the top and the corresponding answer image to match them

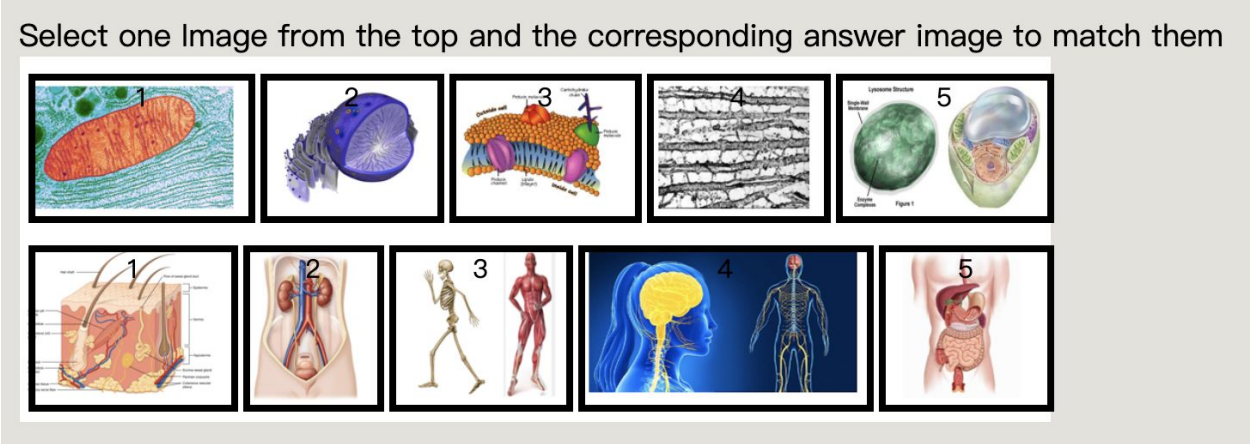


Feature Name: The colors disappear in 1 second after the color of both borders turns red - Implemented

1 point
As a student
So that I can start matching again
I want the red borders gone







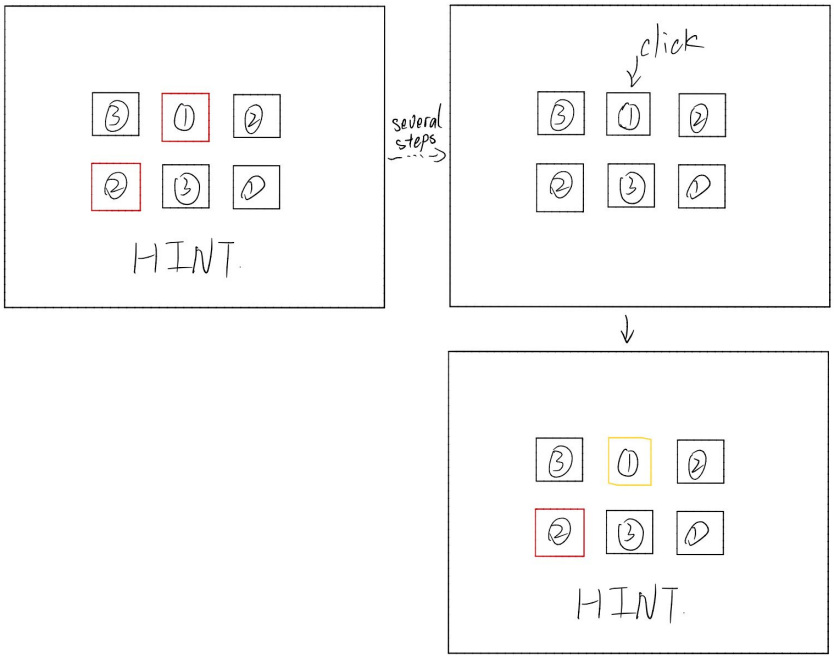
Feature Name: Recall the wrong matching - Implemented

2 points

As a student

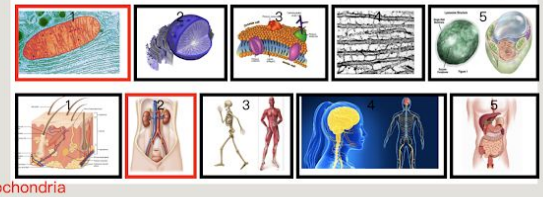
So that I can review the wrong matching

I want to recall the wrong matching I select before



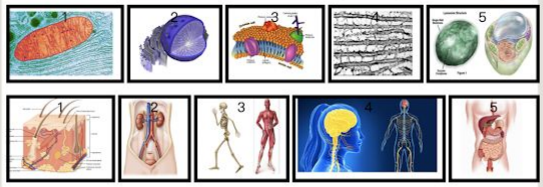
Cells vs. Organ System Matching

Select one Image from the top and the corresponding answer image to match them



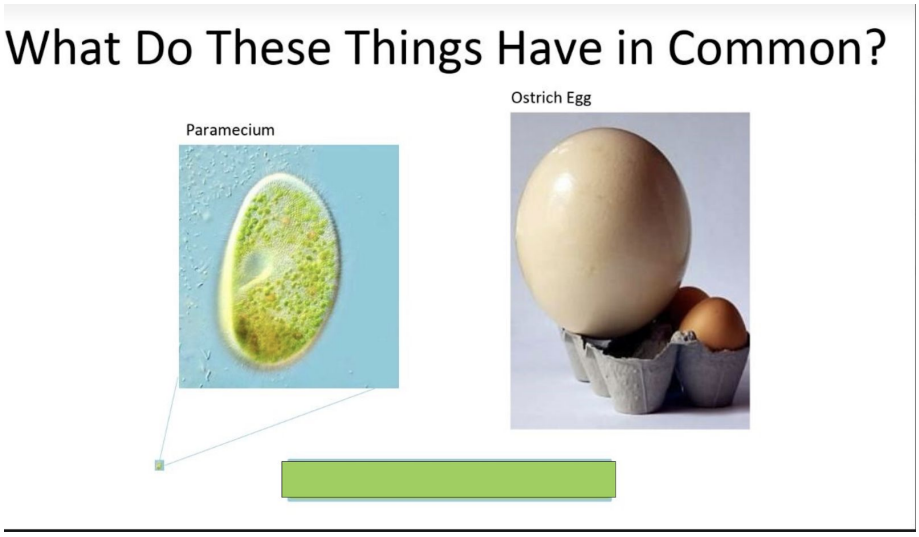
Hint: Look at the slide on Lysosome and Vacuole, and Mitochondria

Select one Image from the top and the corresponding answer image to match them

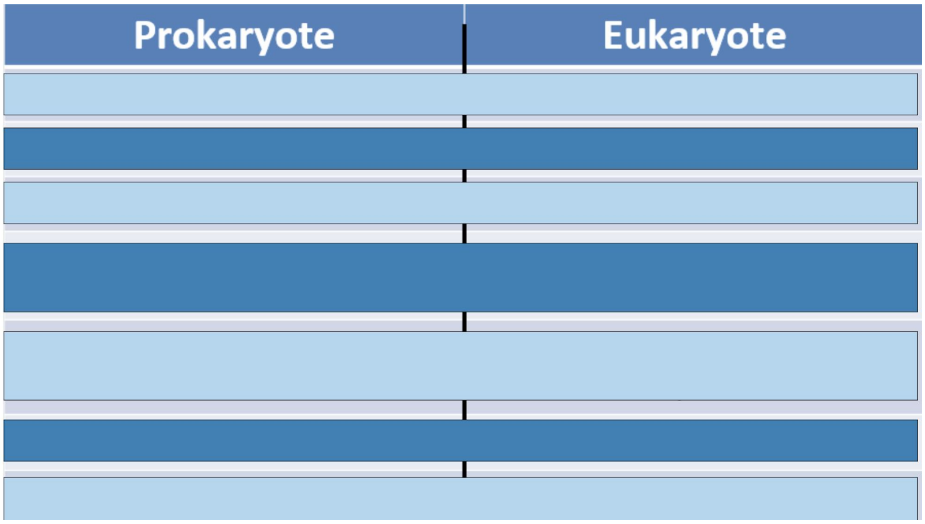


(Slides 4, 12, 14, 16)

On-click event
1 point
As a student
So that I can highlight the important message
I want a button-like blocking object to block the context



Matching blocks to the slides
1 point
As a student
So that the blocks can hide the text correctly
I want to set some blocks to be placed in the right place



Prokaryote	Eukaryote
Primitive / older	New – evolved from prokaryotes
Smaller 1-10 µm	10x Larger 10-100 µm

Create answer showing text

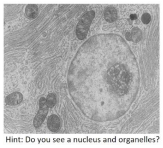
1 point

As a student

So that user can present the answer on the slide

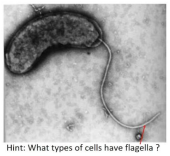
I want to creat a text showing the answer to the question

Prokaryote or Eukaryote ?



Hint: Do you see a nucleus and organelles?

Hint: Is there a nucleus?



Hint: What types of cells have flagella ?

Click me to get the answer!

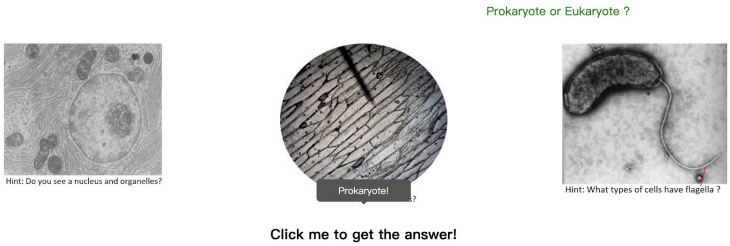
Pop answer when clicking

1 point

As a student

So that user can show the answer after clicking on it

I want to popup the answer after clicking on the bottom



BDD/TDD Process

With the BDD/TDD processes, it becomes clearer how a function should work and shouldn't be over complicated while still meeting the required standard, it also helps us think about drying the code so that each function takes care of one job and one job only. However, since our team members are not familiar with Javascript and its test frameworks, it is difficult for us to write the test compared to writing the functions, so some of the functions we aren't able to write tests for and some of the tests were created after the features were written.

Tools

Git, Github, StepStone, Mocha

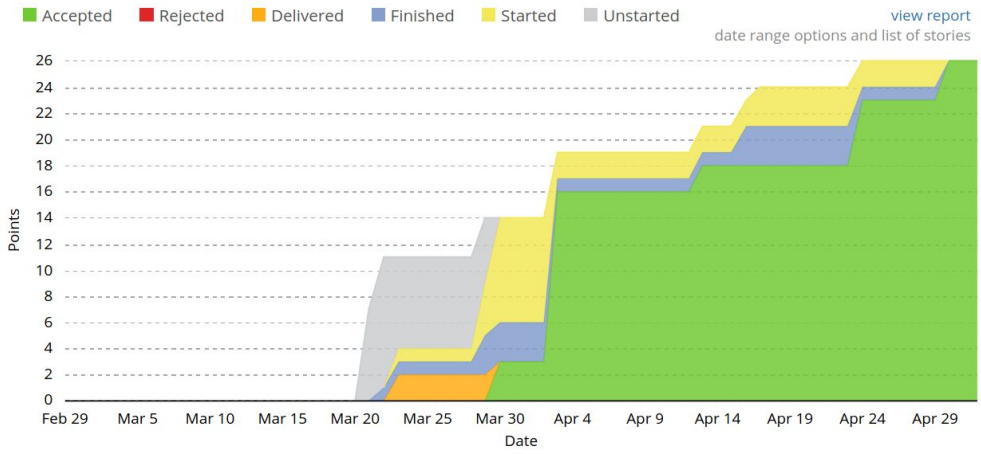
- Git and Github were really handy for projects like this and after everyone learned how to clone, add, commit, push, pull, there weren't any problems. We didn't create too many branches, commit messages were clear, everything was great.
- StepStone is the environment where we deploy our slides. We did find out that there are issues when we deploy and aren't reflected immediately until we cleared our cookies, it took us some time to deploy the slides but since we have the legacy code from the team last year, it wasn't a huge problem.
- Mocha is a JavaScript testing framework that we used for our BDD/TDD processes, with the help of jQuery to imitate events such as click events to test our functions. We only wrote tests for the clickable events because we are having difficulties imitating other user events with Javascript.

Management Approach

Since our project is made of 12 slides and easily divided into teammates. We adopt the distributed approach on our projects, which indicates everyone at least implemented one slide. In addition, our validation has two stages for ensuring our quality of application . One is testing in a local slide, the other one testing after the deployment to Stepstone.

Iteration Summaries

Velocity Graph



Iteration 0

- We haven't met with the user so we reviewed the previous reports and code from the team last year and learned Javascript, jQuery.

Iteration 1

- In this iteration, we received the customers' spec and created 16 user stories and created the lo-fi UI mockups for them. We identified the three categories from the slides that can each be finished by small teams, the categories are drag and drop, matching and others. We then divide ourselves into three subgroups working on each category.

Iteration 2 [Completed 15 points]

- For the three subgroups, the drag and drop group completed 7 points and finished the basic features of slide 53, slide 38, and slide 8. The matching group completed 5 points and finished the basic features of slide 63. The others group completed 3 points and finished the basic features of slide 4 and slide 12.

Iteration 3 [Completed 14 points]

- For the three subgroups, the drag and drop group completed 7 points and finished the basic features of slide 31, and 46, the slide 8 and slide 31 are both deployed on StepStone. The matching group completed 4 points and finished the advanced features of slide 63 and is deployed on StepStone. The others group completed 3 points and finished the basic features of slide 16.

Iteration 4 [Accepted all 29 points]

- All of the subgroups deployed all their slides on StepStone, and testing was done for each slides, since all the user stories were finished and we couldn't think of new features to implement, we didn't add new features