

Animations 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 quiz. 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 that 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 and Wordpress 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' expectations after merging to the Stepstone platform.

Team Roles

Scrum Masters, Developers : Surbhi Thakur, Hemal Mamtora, Rohit Sah, Ganeshprasad Biradar

Product Owners, Developers : Abhishek Sinha, Rohan Chaudhury, Ganeshprasad Biradar, Sherine Davis

We changed the scrum master and product owner in every iteration so that we each were able to get a first hand experience of the roles.

Relevant Links

Pivotal Tracker: <https://www.pivotaltracker.com/n/projects/2536062>

GitHub: <https://github.com/subhithakur25/BiologyLearningGamesAndAnimations/>

Poster Presentation and Demo Video: <https://www.youtube.com/watch?v=VB80CH8iet4>

Deployment on StepStone: [slide 12](#), [slide 16](#), [slide 31](#), [slide 38](#), [slide 44](#), [slide 46](#)

Deployed on WordPress: [slide 12](#), [slide 16](#), [slide 31](#), [slide 44](#), [slide 46](#)

Customer Meeting Summaries

Iteration Meeting	Time	Customer Meeting Summary
Iteration 0	19 th Oct 6:30pm, in-person meeting 21 st Oct 6:20pm, in-person meeting	<ul style="list-style-type: none">The project requirements were made clear.POCs specific to deployment were identified.User stories created based on the given deployment xls.
Iteration 1	26 th Oct 5:20pm, in-person meeting 1st Nov 10:00am, zoom meeting	<ul style="list-style-type: none">Test on phone as wellActionable: for hints on slides, Use our intuition and reference material on available
Iteration 3	30 th Nov 5:30pm, in-person meeting	<ul style="list-style-type: none">Approval for the current phase of the stories.Further details on contacting Daniel Shuta.

Understanding of the legacy project

The project is structured such that each game has its own standalone folder which has

- Index.html
- css/
- img/

Each group has its own set of games. For example ek_cell_structures for games related to cell structures, ek_cell_types for games related to cell types etc. The standalone folder has names such as slide16, slide38 etc showing some relation to the slides deployed on wordpress or stepstone. But these numbers don't exactly correspond to the matching slide numbers in stepstone or wordpress. The mapping is determined by ppj values as explained in the Deployment section in this report. Each game was developed by previous teams and thus have, at times, different github repositories. Sometimes, there were also no repositories present for a few games.

Development is done by making appropriate changes to either of the index.html, css/ js/ img/ files. Testing on the deployment(Stepstone) environment is done with help of a dummy activity area in Stepstone. However, a certain file "draggybox_###" needs to be updated to launch and

test the deployment of the specific slide/game and test for bugs/issues. We used server press to test the slides on the wordpress side. Once the slides were running properly on server press then we proceeded to deploy it to the wordpress vetmed website.

The deployment is not straightforward. There are two separate persons, whom we need to contact, for the deployment - namely Samiksha Marne-for WordPress and Daniel Shuta - for stepstone.

User Stories

Slide #16 - User Story #4

Feature : Improve Prokaryotic/Eukaryotic slide animation

As a player, I would like to match each image against a particular category, i.e Prokaryotic and Eukaryotic rather than just pick the Eukaryotic images alone.

On reviewing progress of enhancement on Slide 16, Dr. Walker suggested a change to highlight questions that had wrong responses or answers marked wrong in them. Made adequate changes to highlight the question box with red color and show appropriate error messages in the hint box.

Screenshots :

LoFI UI :

The wireframe shows a user interface for classifying four images. At the top, a header reads: "With the knowledge you have obtained decide whether the images below are prokaryotic or eukaryotic." Below this are four image boxes labeled "Image 1", "Image 2", "Image 3", and "Image 4". Under each image box are two radio buttons and labels: "Prokaryotic" and "Eukaryotic". A "Submit" button is located at the bottom of the main section. Below the main section is a large, empty rectangular area labeled "Area to show suggestions / hint / result after submission of answer".

Before, prior to taking up this feature enhancement the slide didn't have any intuitive approach to solving it or using it. Clicking on the boxes unveiled hidden images in random order and didn't

clearly indicate if the image corresponded to Prokaryotic or Eukaryotic cells.

Prokaryotic or Eukaryotic?



After enhancing it, every image has a checkbox menu to choose between categories and in case if any answer is wrong the box is marked in red indicating that the answer needs to be corrected. Also a hint box was added towards the bottom that provides hints based on which image was clicked.

With the knowledge you have obtained decide whether the images below are
Prokaryotic or Eukaryotic

The screenshot shows four images for classification. The first image is a circular micrograph with a grid-like internal structure, labeled with radio buttons for 'Eukaryotic' (unchecked) and 'Prokaryotic' (checked). The second image is a micrograph of a cell with a prominent nucleus and organelles, labeled with radio buttons for 'Eukaryotic' (checked) and 'Prokaryotic' (unchecked). The third image is a micrograph of a cell with a large central vacuole, labeled with radio buttons for 'Eukaryotic' (checked) and 'Prokaryotic' (unchecked). The fourth image is a micrograph of a cell with a complex internal structure, labeled with radio buttons for 'Eukaryotic' (unchecked) and 'Prokaryotic' (checked). A 'Submit' button is located below the images. A message box at the bottom says 'Congrats ! You got all of them correct !'.

Screenshot : When all answers are correctly given. Updated hint

With the knowledge you have obtained decide whether the images below are
Prokaryotic or Eukaryotic

The screenshot shows four images for classification. The first image is a circular micrograph with a grid-like internal structure, labeled with radio buttons for 'Eukaryotic' (unchecked) and 'Prokaryotic' (checked). The second image is a micrograph of a cell with a prominent nucleus and organelles, labeled with radio buttons for 'Eukaryotic' (checked) and 'Prokaryotic' (unchecked). The third image is a micrograph of a cell with a large central vacuole, labeled with radio buttons for 'Eukaryotic' (checked) and 'Prokaryotic' (unchecked). The fourth image is a micrograph of a cell with a complex internal structure, labeled with radio buttons for 'Eukaryotic' (unchecked) and 'Prokaryotic' (checked). A 'Submit' button is located below the images. A message box at the bottom says 'You got 2 out of 4 correct ! Hint : Verify your answers in the colored boxes'.

Screenshot : When there are wrong answers. Updated view and hint

In the pivotal tracker this user story was assigned with 3 points, that's the highest possible score. This was because there was a significant amount of background study that needed to be done to get familiar with existing code and language so as to alter and make the necessary

changes. Apart from that, any development made needed to be responsive in nature i.e. it works seamlessly on other devices too.

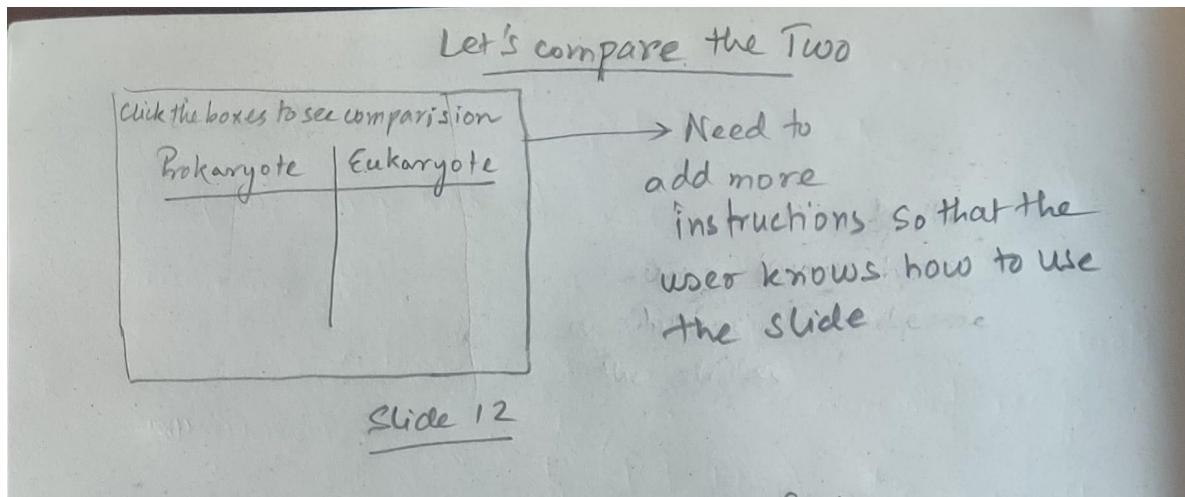
Current Status : Deployed successfully to Stepstone and Wordpress.

Slide #12 - User Story #9

Feature : Addition of instructions to Let's Compare the Two Game

As a user, the instructions for the slide are not clear to me, I should be able to see more instructions on how to use the slides.

Lo-fi Ui:



Screenshots :

Click the Boxes to See the Comparison

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

Click the boxes to see the comparison

Prokaryote	Eukaryote
Primitive / older	New (evolved from prokaryotes)
Smaller 1-10 μm	10x Larger 10-100 μm
	Click Me!

Prior to any changes, it was not intuitive as to how the page had to be operated. On clicking boxes it didn't reveal any comparison details as expected. After the update, a 'Click Me' appears on each individual box saying that on clicking it the hint will be revealed.

Rationale: On the pivotal tracker this was given 3 points as there was significant time spent on understanding the legacy code and a lot of ambiguity on how the hint system would be implemented.

Current Status : Deployed to Stepstone and Wordpress'

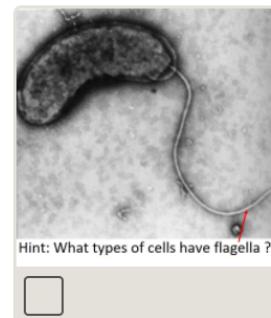
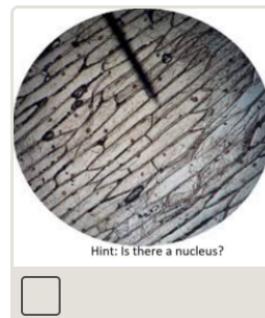
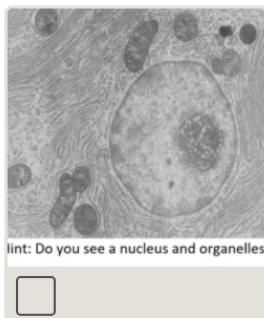
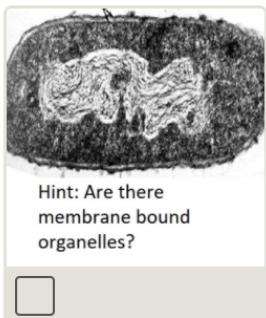
Slide #16 - User Story #5

As a player, I would like to match each image against a particular category, i.e., Prokaryotic and Eukaryotic rather than just pick the Eukaryotic images alone.

Screenshots :

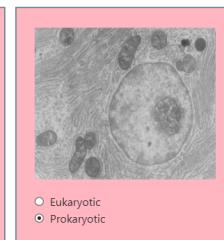
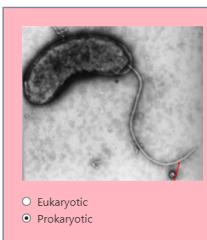
The user story focused on making changes to Slide 16 such that the same version is deployed both in Stepstone and also in Wordpress. Prior to making any changes here the version in Stepstone differed significantly in comparison to the one in Wordpress. The Stepstone deployment had a question that asked the user to select only Eukaryotic cells.

Which of the following are Eukaryotic? Click all that apply



After the changes were made, both wordpress and Stepstone versions were brought to perform the same way as shown below.

With the knowledge you have obtained decide whether the images below are Prokaryotic or Eukaryotic



Submit

You got 2 out of 4 correct ! Hint : Verify your answers in the colored boxes

Rationale: On the pivotal tracker this user story is marked with 3 points because a lot of information regarding the deployment process was also uncovered as a part of this user story's development. Lot of time was spent on reading through the prior team's reports in figuring out how to test the initial release of this slide on Stepstone to ensure that no complications arise. This pursuit resulted in understanding more about the different tasks involved in testing and deploying to Stepstone. Since this user story is very closely related to user story 4, they share the same LoFi UI.

Current Status : Developed and deployed to Stepstone and Wordpress

Slide#44 - User Story #6 : Implement restart game in the plant hangman game(slide 44)

As a player, I should be able to restart the game with the click of a button at any instant as needed.

Lo-fi Ui:

PLANT HANGMAN

WHAT PROCESSES TAKES PLACE IN THE CHLOROPLAST OF A PLANT CELL?

Use the alphabet below to guess the word, or click hint to get a clue.

A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z				

P _ _ _ _ _ Y _ _ _ _ _

You have 2 lives

Clue: - Go back and read about chloroplast

[Hint](#) [Restart Game](#)



PLANT HANGMAN

WHAT PROCESSES TAKES PLACE IN THE CHLOROPLAST OF A PLANT CELL?

Use the alphabet below to guess the word, or click hint to get a clue.

A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z				

_ _ _ _ _

You have 4 lives

Clue: - Go back and read about chloroplast

[Hint](#) [Restart Game](#)



We understood the legacy code and determined how exactly the changes should be made. Initially the “Play again” button present in the slide was not restarting the game until the game was over for the player. After fixing this issue the game can now be restarted whenever the player wants to restart it by just pressing the “Play again” button.

Testing: We manually tested the feature on our browser and on the mobile device emulator provided by the Chrome DevTools

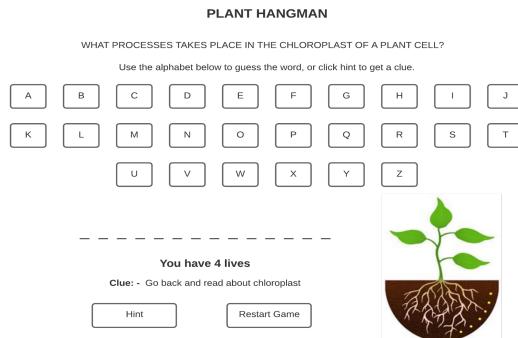
Current Status : Deployed on wordpress and Stepstone.

Rationale : On pivotal tracker, it was assigned 3 points as there was significant amount of time spent to initially understand the legacy code and identify the particular issues. After that we made the corresponding changes to fix the issue.

Slide #44 - User Story #7: Improvement in the plant hangman game(slide 44)

As a player, I want to make improvements to the existing structure so that the game animations are properly structured when viewed on any device

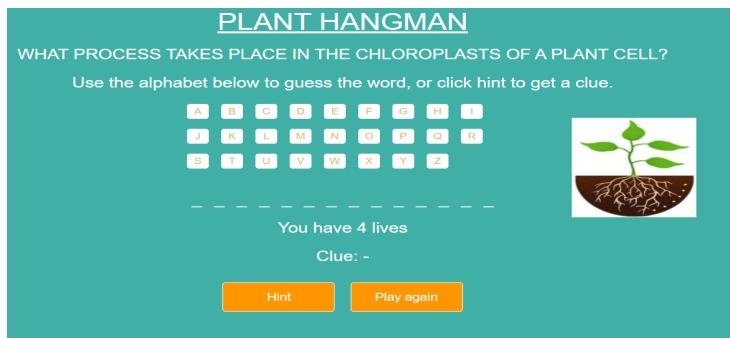
Lo-fi UI:



We understood the legacy code and determined how exactly the changes should be made. We have restructured the original alphabet layout from a simple row layout to a 3x9 grid structure. Following are the before and after changes slide layouts:



Before code change



After code change

Testing: We viewed the layouts on our browser and on the mobile device emulator provided by the Chrome DevTools.

Current Status : Deployed on wordpress and Stepstone.

Rationale : On pivotal tracker, it was assigned 3 points as there was significant amount of time spent to initially understand the legacy code and identify the particular issues. After that we made the corresponding changes to fix the issue.

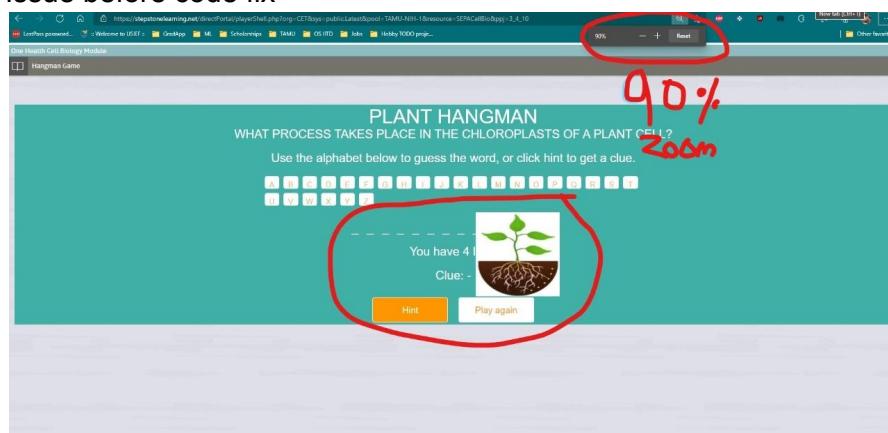
Slide #44 - User Story #13:

As a player,
So that I can see the blanks clearly while playing the game at different zoom levels on laptop/PC,
I want the plant image to not overlap the blanks and other HTML elements while changing the zoom levels or resolution of my screen.

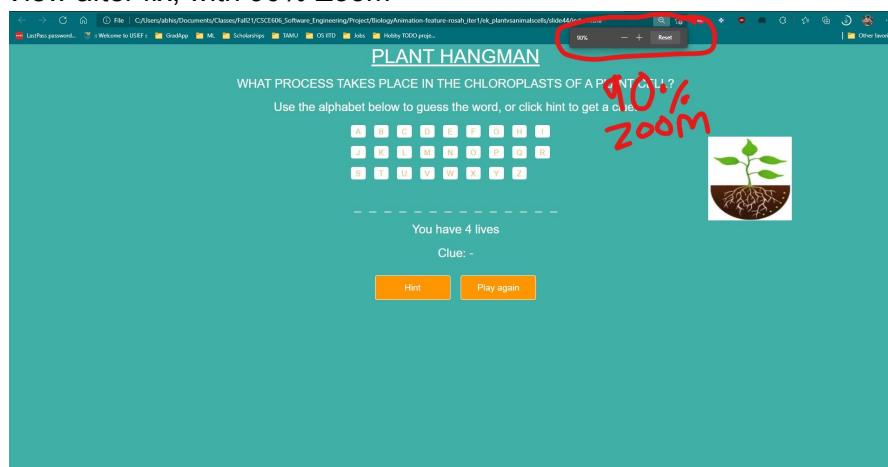
Lo-fi UI:

There is no lo-fi UI since, this issue was identified in the middle of the iteration while development of another feature.

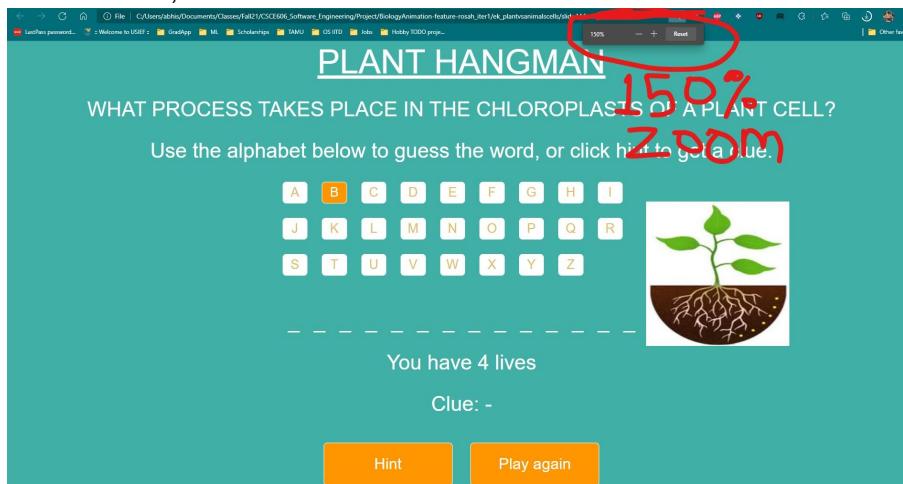
Issue before code fix



View after fix, with 90% Zoom



View after fix, with 150% zoom:



Testing : We manually tested this fix on our browser and on the mobile device emulator provided by the Chrome Developer Tools. Also deployed on futuredogter server and tested the code there.

Current Status : Deployed on wordpress and Stepstone.

Rationale : On pivotal tracker, it was assigned 3 points as there was significant amount of time spent to understand the legacy code and identify the particular issues. After that we made the corresponding changes to fix the issue. Time was also spent on understanding the usage of Chrome web tools to test our developed features.

Slide# 44 - User Story #14:

As a player,
I should be able to see the fixes implemented in user stories 6, 7, 13 regarding the plant hangman game issues on the vetmed website and stepstone.

Issues fixed and code deployed on futuredogter server, link:

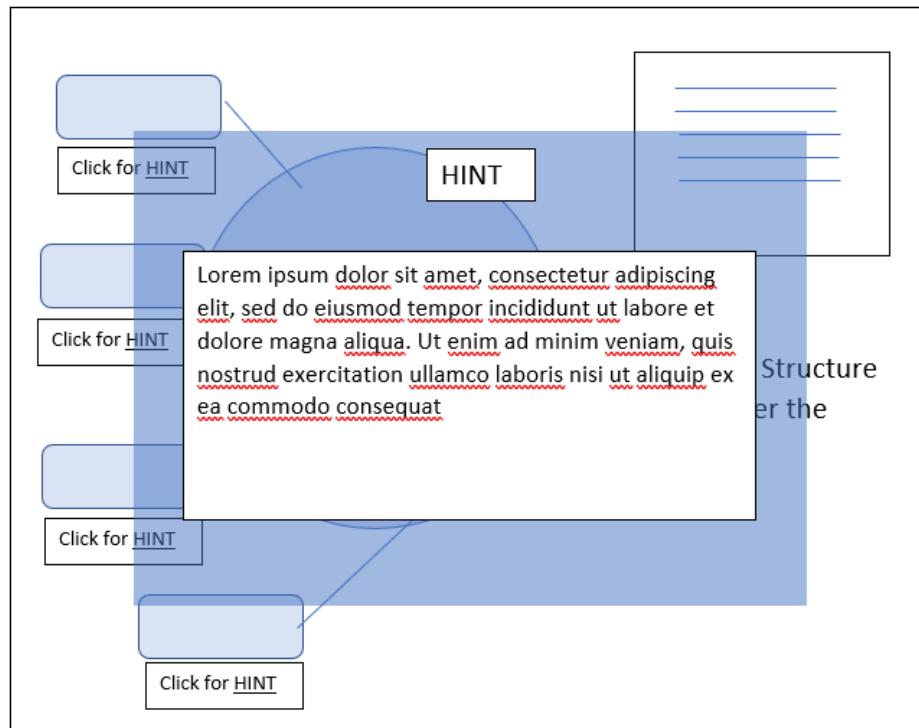
https://futuredogter.com/stepstone/playerShell.php?org=CET&sys=public.Latest&pool=AMU-CET-1&resourceloc=www.futuredogter.com&resourceavatar=NIH-SEPA-1&resource=sample1&ppj=1_1_1044

Rationale : On pivotal tracker, it was assigned 3 points significant amount of time was spent on understanding the futuredogter deployment environment. This required continuous communication with Daniel for instructions (either via mail or zoom calls)

Slide #31 User Story#3-

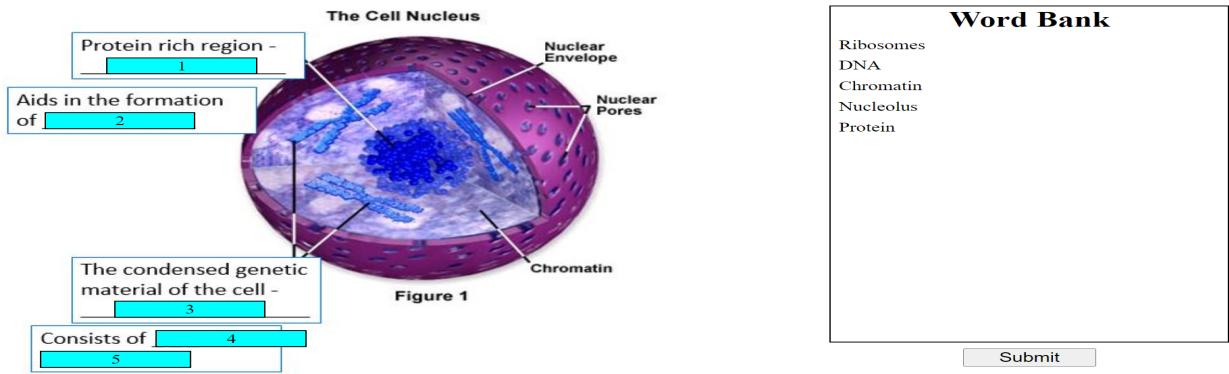
Feature: As a player, I would like to have a few hints for the different questions presented to me in the game while answering the questions so that I know which topic is the question from.

Lo-fi UI:

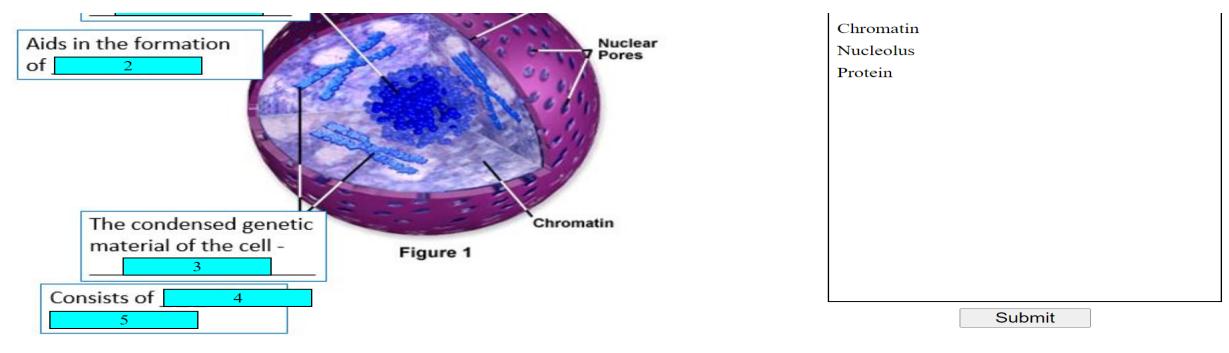


We have implemented hint system for the questions. Each question is linked to a hint. And the user can click on the particular hint button for the question to get the respective hint which would show as a popup.

BEFORE:



AFTER:



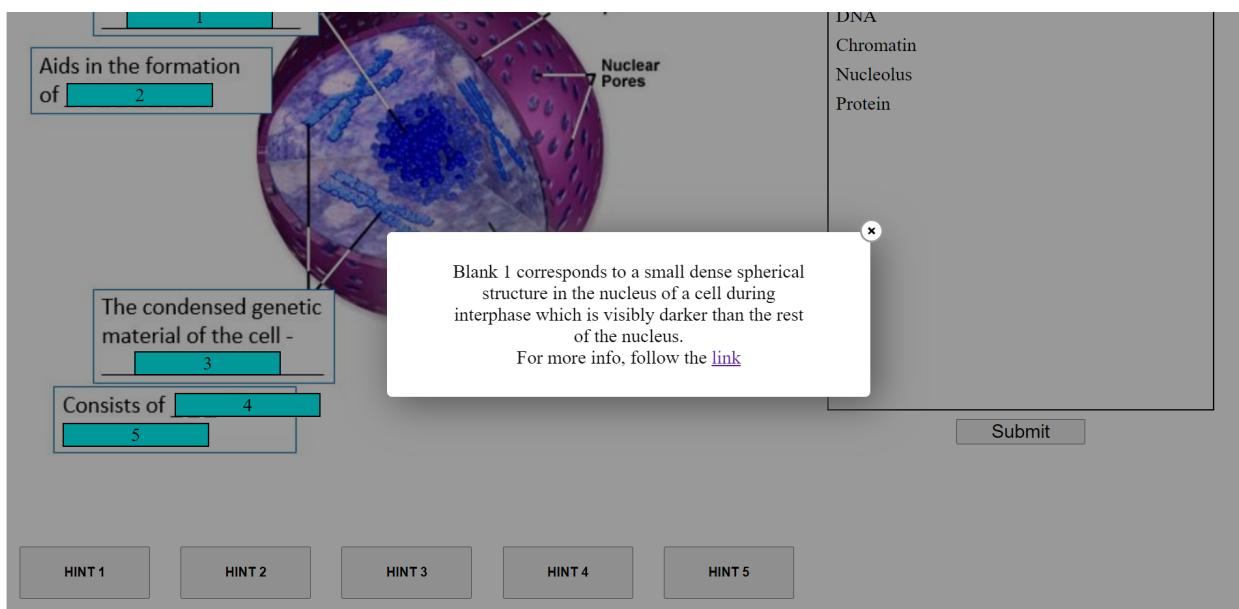
HINT 1

HINT 2

HINT 3

HINT 4

HINT 5



Issues: we faced issues while implementing the z-index, which defines the layout of each section on top of each other. Earlier this was hardcoded which created the issue.

Tests:

https://futuredogter.com/stepstone/playerShell.php?org=CET&sys=public.Latest&pool=TAMU-CET-1&resourceloc=www.futuredogter.com&resourceavatar=NIH-SEPA-1&resource=sample1&ppj=1_1_1031

Testing on a local wordpress server done using server press.

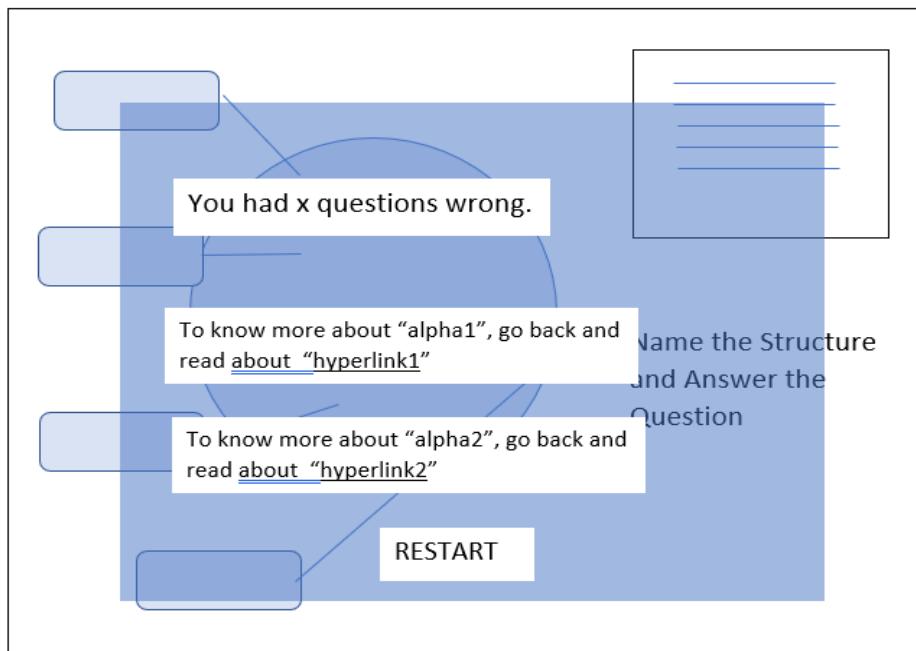
Current Status : Deployed on wordpress and Stepstone.

Rationale : On pivotal tracker, it was assigned 3 points as it required significant time to understand the javascript and CSS to implement the modal feature and to connect the iframes of Wikipedia to the hint system.

Slide#31 - User Story #1:

Feature: As a player, I would like to know which of my answers were wrong after I click the check/submit button, and would want to redirect to the specific page that contains that particular piece of information.

Lo-fi UI:



Status: Deployed

We have implemented the redirects when a user picks wrong answers. Everytime the user completes with wrong answers, it specifies number of wrong answers and provides link for the respective information.

The diagram shows a cross-section of the cell nucleus. Labels include 'The Cell Nucleus', 'Nuclear Envelope', and 'Nuclear Pores'. To the left, there are four boxes containing text and a small red bar:

- 'Protein rich region -' followed by a red bar labeled 'Protein'.
- 'Aids in the formation of' followed by a red bar labeled 'DNA'.
- 'The condensed genetic material of the cell -' followed by a red bar labeled 'Ribosomes'.
- 'Consists of' followed by a red bar labeled 'Chromatin'.
- 'Nucleolus'

Below the diagram, the text 'You got 5 answers wrong.' is displayed. A message encourages the user to go back and read about the Nucleolus, with links to 'Nucleolus', 'Ribosomes', and 'Chromatin'. Below this, Figure 1 is mentioned with links to 'DNA' and 'Protein'. A 'Word Bank' section is on the right, and a 'Submit' button is at the bottom right.

Tests:

https://futuredogter.com/stepstone/playerShell.php?org=CET&sys=public.Latest&pool=IAMU-CET-1&resourceloc=www.futuredogter.com&resourceavatar=NIH-SEPA-1&resource=sample1&ppj=1_1_1031

Testing on a local wordpress server done using server press.

Current Status : Deployed on wordpress and Stepstone.

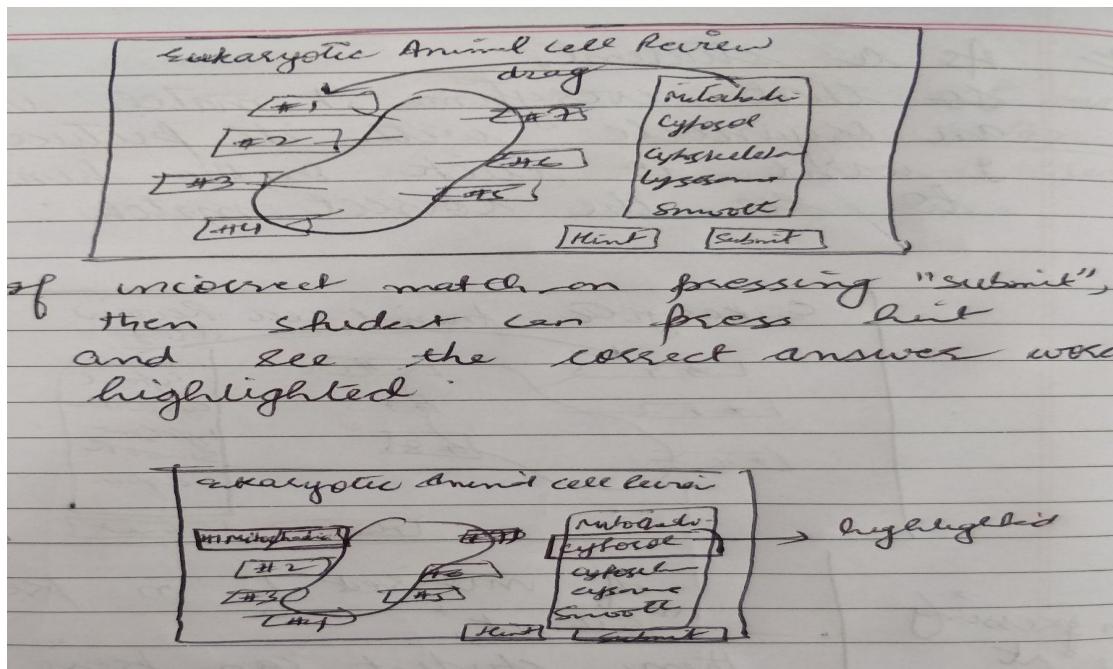
Rationale : On pivotal tracker, it was assigned 3 points as it required significant time to understand the jquery and CSS to implement the fading out effect and to connect the iframes of Wikipedia to the info section at the end of submission.

Slide# 38 - User Story #12:

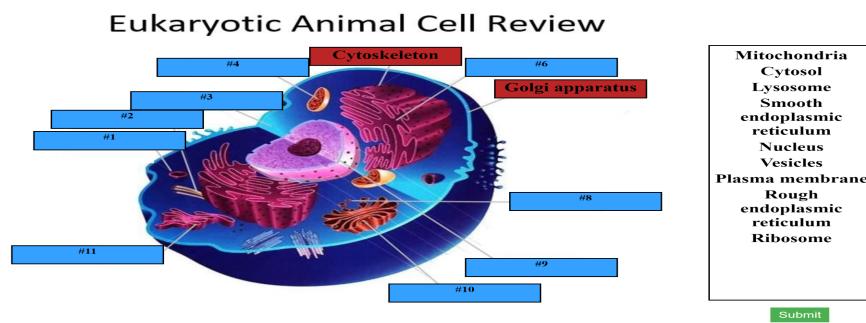
As a student
So that every time I match incorrectly an organelle with its picture
I want to click on the hint button to see the correct match.

We have implemented the hint system for this slide. Everytime the user clicks on the hint button, the incorrectly matched boxes are highlighted with the same colour as the correct organelle name. If the user now matches them correctly and clicks on the submit button, the updates are similar to the ones that were there before the hint system was implemented.

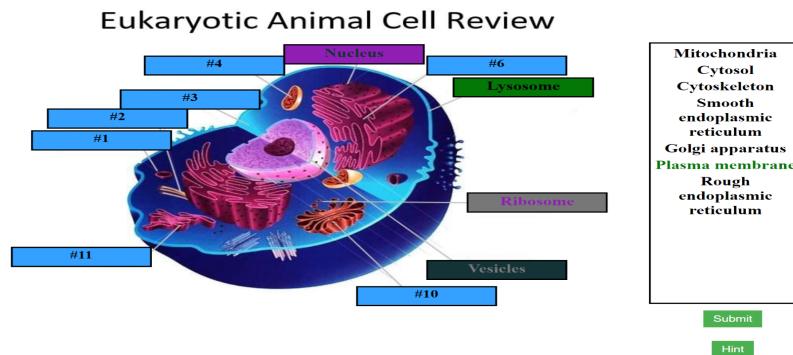
Lofi UI:



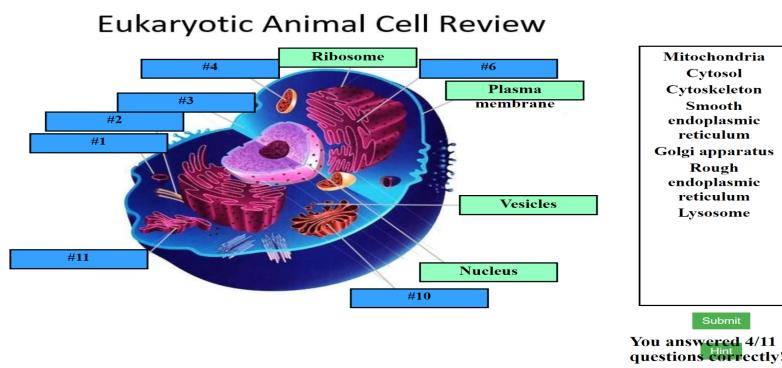
Screenshot 1 : Vanilla page. No hint system.



Screenshot 2 : On pressing hint, the color match happens between the box and the text



Screenshot 3 : After hint when submit is now clicked, the answers appear in a legible format in the box.



Points allotted: 3

Current Status : Deployed successfully to Stepstone.

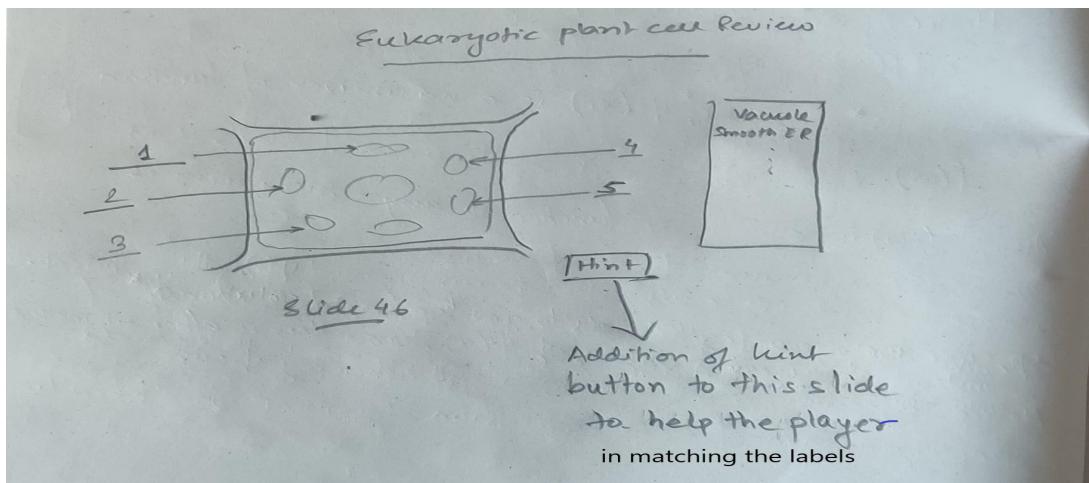
Slide# 46 - User Story #8:

Feature: Addition of hints to Eukaryotic Plant Cell Review/Matching Game

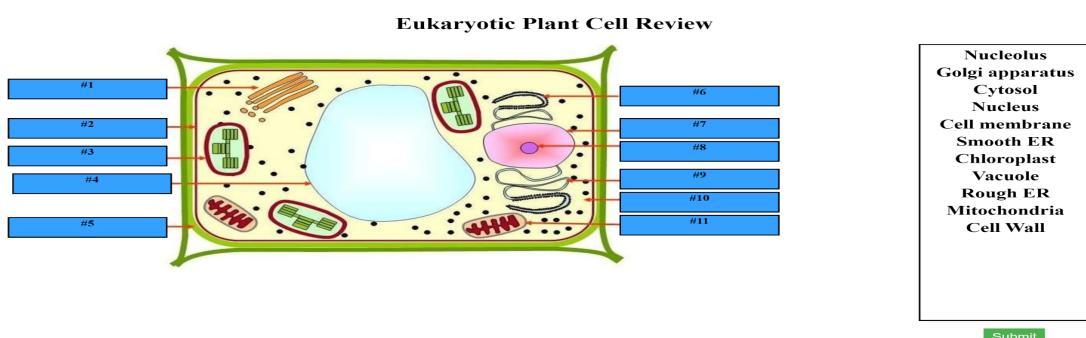
As a player
So that I can properly match all the labels to the corresponding boxes
I should be able to see some hints when I play the Eukaryotic Plant Cell Review game

We have implemented the hint system for this slide. Everytime the user clicks on the hint button, the incorrectly matched boxes are highlighted with the same colour as the correct organelle name. If the user now matches them correctly and clicks on the submit button, the updates are similar to the ones that were there before the hint system was implemented.

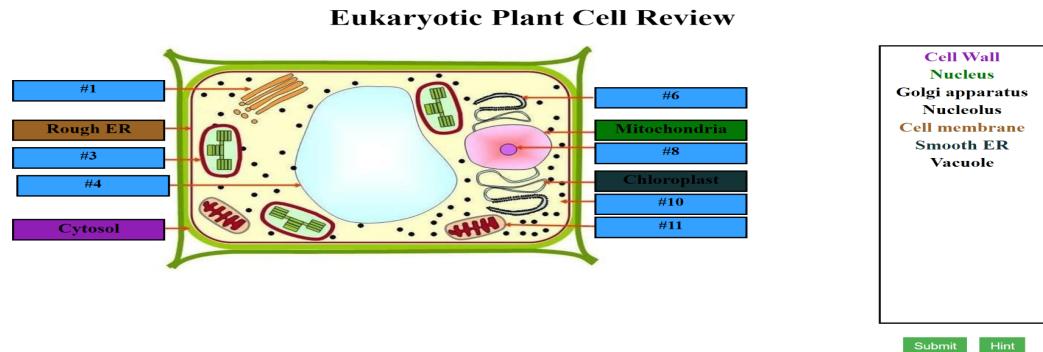
Lo Fi from Iteration 0



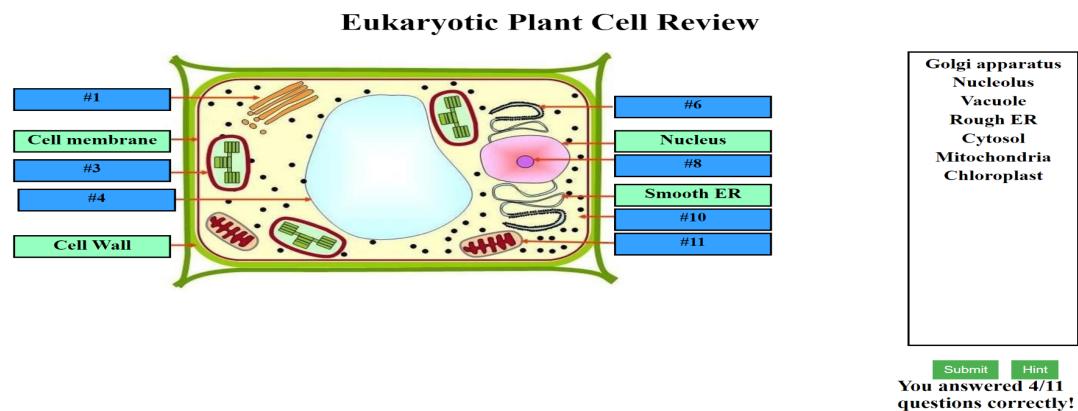
Screenshot 1 : Vanilla page. No hint system.



Screenshot 2 : On pressing the hint button, the color match happens between the box and the text.



Screenshot 3 : After hint when submit is now clicked, the answers appear in a legible format in the box.



Points allotted: 3

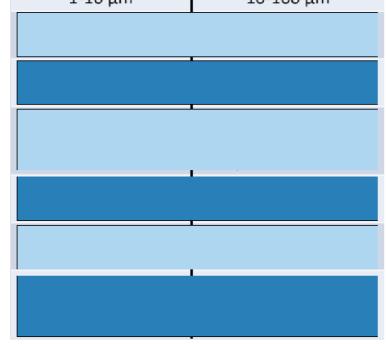
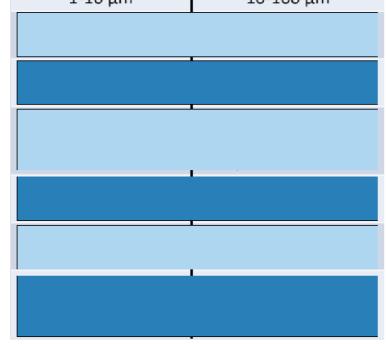
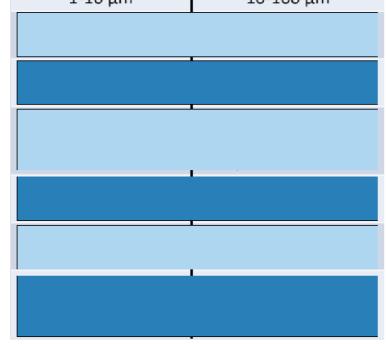
Current Status : Deployed successfully to Stepstone and Wordpress.

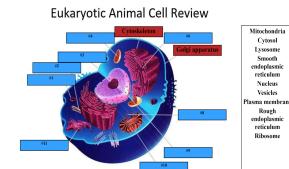
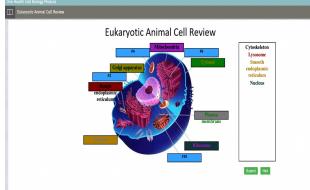
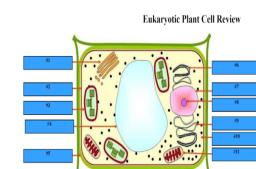
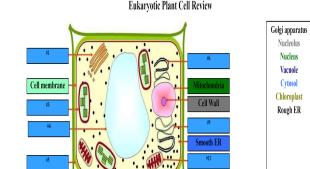
User Story #16: Points allotted: 3

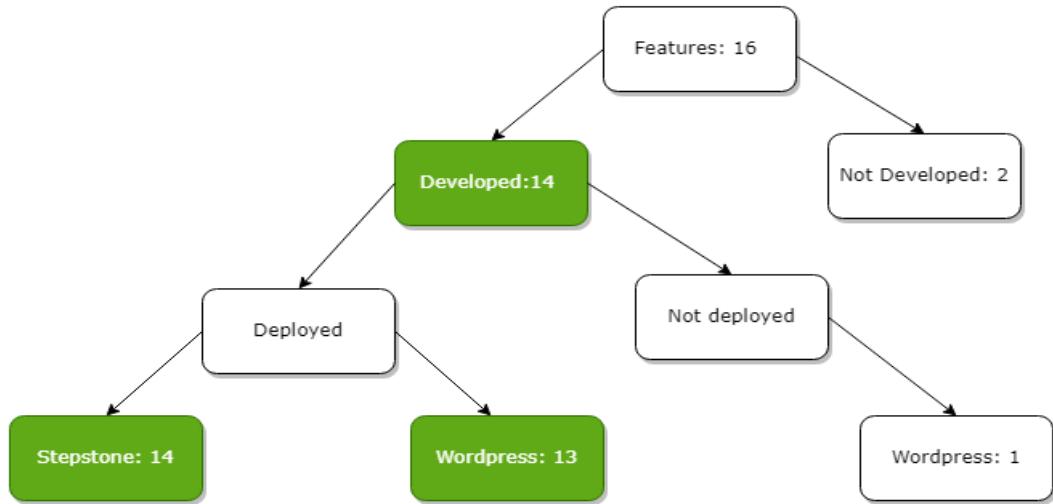
Figured out setup for serverpress. Deployed locally on serverpress and then met Samiksha for deployment on wordpress. Deployed (slides: 16, 38, 44). Figured out that links should be https, and not http. Found and reported issue in wordpress deployment of user story 38.

SUMMARY :

	User Story	Before	After
Slide 31 User Story #1	As a player, I would like to know which of my answers were wrong after I click the check/submit button, and would want to redirect to the specific page that contains that particular piece of information. Points allotted: 3		
Slide 31 User Story #3	As a player, I would like to have a few hints for the different questions presented to me in the game while answering the questions so that I know which topic is the question from. Points allotted: 3		
Slide #44 - User Story #7	As a player, I want to make improvements to the existing structure so that the game animations are properly structured when viewed on any device Points allotted : 3		
Slide#44 - User Story #6	As a player, I should be able to restart the game with the click of a button at any instant as needed. Points allotted : 3	<p>Before- The play again button worked only after the game was over and all the lives had run out</p>	<p>After- The play again button works at any instant and restarts the game</p>

Slide #44 - User Story #13:	<p>As a player, So that I can see the blanks clearly while playing the game at different zoom levels on laptop/PC, I want the plant image to not overlap the blanks and other HTML elements while changing the zoom levels or resolution of my screen.</p> <p>Points allotted : 3</p>																		
Slide #12 - User Story #9	<p>As a user, the instructions for the slide are not clear to me, I should be able to see more instructions on how to use the slides.</p> <p>Points allotted: 3</p>	<p>Click the Boxes to See the Comparison</p> <table border="1" data-bbox="687 789 1073 1275"> <thead> <tr> <th>Prokaryote</th> <th>Eukaryote</th> </tr> </thead> <tbody> <tr> <td>Primitive / older</td> <td>New (evolved from prokaryotes)</td> </tr> <tr> <td>Smaller 1-10 µm</td> <td>10x Larger 10-100 µm</td> </tr> <tr> <td colspan="2"></td> </tr> </tbody> </table>	Prokaryote	Eukaryote	Primitive / older	New (evolved from prokaryotes)	Smaller 1-10 µm	10x Larger 10-100 µm			<p>Click the boxes to see the comparison</p> <table border="1" data-bbox="1090 789 1434 1275"> <thead> <tr> <th>Prokaryote</th> <th>Eukaryote</th> </tr> </thead> <tbody> <tr> <td>Primitive / older</td> <td>New (evolved from prokaryotes)</td> </tr> <tr> <td>Smaller 1-10 µm</td> <td>10x Larger 10-100 µm</td> </tr> <tr> <td colspan="2"></td> </tr> </tbody> </table>	Prokaryote	Eukaryote	Primitive / older	New (evolved from prokaryotes)	Smaller 1-10 µm	10x Larger 10-100 µm		
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Slide #16 - User Story #4	<p>As a player, I would like to match each image against a particular category, i.e Prokaryotic and Eukaryotic rather than just pick the Eukaryotic images alone.</p> <p>Points allotted: 3</p>	<p>Prokaryotic or Eukaryotic?</p> 	<p>With the knowledge you have obtained decide whether the images below are Prokaryotic or Eukaryotic.</p>  <p>Next part of Exercise 1: Identify your answers in the colored boxes</p>																
User Story #16	<p>Figured out setup for serverpress. Deployed locally on serverpress and then met Samiksha for</p>	<p>Deployment story: no images required</p>																	

	<p>deployment on wordpress. Deployed (slides: 16, 38, 44). Figured out that links should be https, and not http. Found and reported issue in wordpress deployment of user story 38.</p> <p>Points allotted: 3</p>		
Slide #16 User story #5	<p>As a player, I would like to match each image against a particular category, i.e., Prokaryotic and Eukaryotic rather than just pick the Eukaryotic images alone.</p> <p>Points allocated: 3</p>	 <p>Which of the following are Eukaryotic Cells?</p> <ul style="list-style-type: none"> Hint: Are there membrane bound organelles? <input type="checkbox"/> Hint: Do you see a nucleolus and ergastoplasm? <input type="checkbox"/> Hint: Is there a nucleus? <input type="checkbox"/> Hint: What type of cell have flagella? <input type="checkbox"/> 	<p>With the knowledge you have obtained decide whether the images below are Prokaryotic or Eukaryotic.</p>  <p>With the knowledge you have obtained decide whether the images below are Prokaryotic or Eukaryotic.</p> <p>(A) Prokaryotic (B) Eukaryotic</p> <p>(A) Prokaryotic (B) Eukaryotic</p> <p>(A) Prokaryotic (B) Eukaryotic</p> <p>(A) Prokaryotic (B) Eukaryotic</p> <p>Submit</p> <p>You got it! If you got it wrong, try again in the colored boxes!</p>
Slide 38 User Story #12	<p>As a student, So that every time I match incorrectly an organelle with its picture, I want to click on the hint button to see the correct match.</p> <p>Points allotted : 3</p>	 <p>Eukaryotic Animal Cell Review</p> <ul style="list-style-type: none"> 1. Cytoskeleton 2. Nucleus 3. Endoplasmic reticulum 4. Golgi apparatus 5. Vacuole 6. Mitochondria 7. Cytosol 8. Peroxisomes 9. Nucleolus 10. Vesicles 11. Plasma membrane 12. Rough endoplasmic reticulum 13. Ribosomes 14. Lysosomes <p>Submit</p>	 <p>Eukaryotic Animal Cell Review</p> <p>1. Cytoskeleton 2. Nucleus 3. Endoplasmic reticulum 4. Golgi apparatus 5. Vacuole 6. Mitochondria 7. Cytosol 8. Peroxisomes 9. Nucleolus 10. Vesicles 11. Plasma membrane 12. Rough endoplasmic reticulum 13. Ribosomes 14. Lysosomes</p>
Slide 46 User Story #8	<p>As a player, So that I can properly match all the labels to the corresponding boxes, I should be able to see some hints when I play the Eukaryotic Plant Cell Review game</p> <p>Points allotted : 3</p>	 <p>Eukaryotic Plant Cell Review</p> <ul style="list-style-type: none"> 1. Nucleolus 2. Golgi apparatus 3. Cytosol 4. Nucleus 5. Endoplasmic reticulum 6. Smooth ER 7. Chloroplast 8. Vacuole 9. Rough ER 10. Mitochondria 11. Cell Wall 12. Cell membrane 13. Nucleus 14. Vacuole <p>Submit</p>	 <p>Eukaryotic Plant Cell Review</p> <p>1. Nucleolus 2. Golgi apparatus 3. Cytosol 4. Nucleus 5. Endoplasmic reticulum 6. Smooth ER 7. Chloroplast 8. Vacuole 9. Rough ER 10. Mitochondria 11. Cell Wall 12. Cell membrane 13. Nucleus 14. Vacuole</p>



BDD/sTDD 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.

- **Manual testing**
Open the respective index.html file on different browsers and check if the change is being reflected on the browser. Try different aspect ratios on the browser. Do functional testing manually and check if the response is as expected.
- **Emulating phone browser**
Using inspect element on the browser, choose “toggle device toolbar”. Here, you can choose different aspect ratios based on different choice of mobile handset like MotoG, Google Pixel, Iphone, etc.
- **FutureDogter:**
We figured out how to use this for testing deployments before deploying them to the production server by looking at previous conversations with Daniel Shuta because there is no proper documentation available for this. We also figured out how each URL maps to a test deployment and came up with a new way to test multiple deployments at once by generating unique URLs for each of them (from what we could gather from previous

teams reports it seems they tested each slide one by one which would have increased the time taken for testing).

- **Server press:**

This was used to test slides before deploying to the wordpress production server. This was relatively straightforward to set up locally and use but we ran into a few issues when we pushed to the production server. One of the main issues was that the ordess website blocks all HTTP links, so jQuery was not working on a few slides. We debugged this and other minor issues with the help of Samiksha Marne and deployed all the slides to production.

Tools

Git, Github, StepStone, ServerPress, FutureDogter

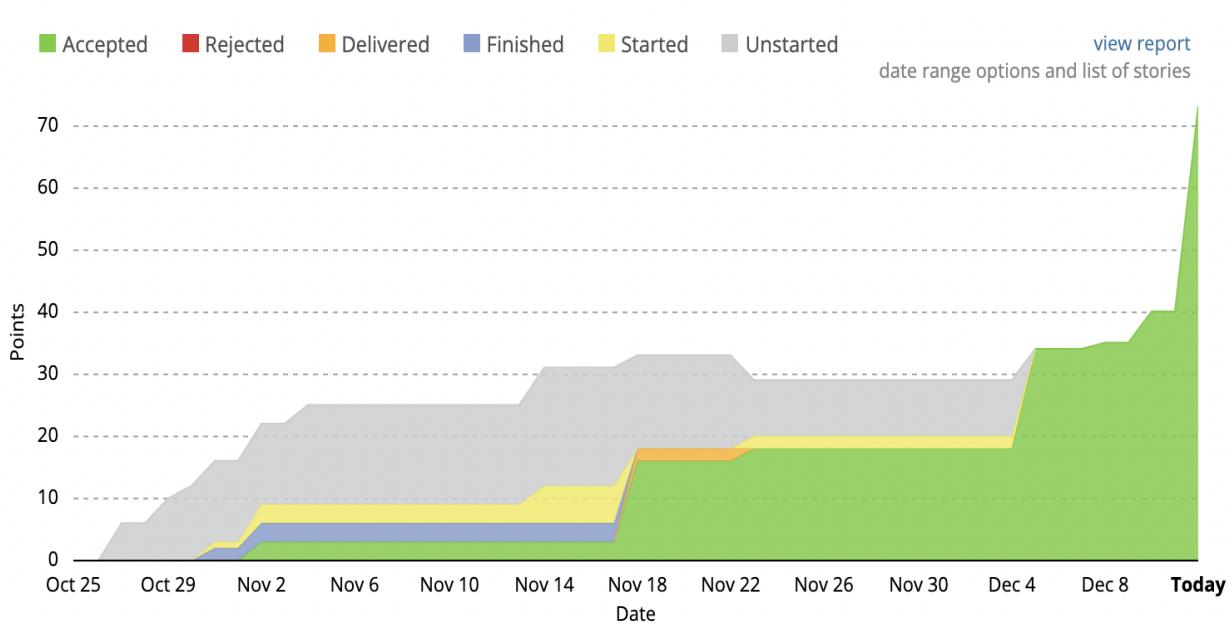
- Git and Github were really handy for projects like this and after everyone learned how to clone, add, commit, push, pull, there weren't any problems. We didn't create too many branches, commit messages were clear, everything was great.
- StepStone is the environment where we deploy our slides. We did 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.
- ServerPress: This is a tool to test wordpress website locally before deploying them.
- Futuredogter: This is an environment to test deployments for stepstone production environment.

Management Approach

Since our project is made of 7 slides and easily divided into teammates. We adopt the distributed approach where we worked in 3 groups, split into 2,2 and 3 persons group.

Iteration Summaries

Velocity Graph



Iteration 0:

In our very first iteration, we met our customer - Dr. Duncan Walker, who familiarized us with the games that have already been deployed on the Wordpress website. He outlined 2 major tasks for us. 1) To deploy the games on Wordpress and StepStone. 2) To add animations to the existing games. The next task involved figuring out games in which animations can be added to make them more attractive to the students. We worked on finding out which games needed animation and the ones that did need it, what type of animation could be added. We came up with user stories, individually, and met over zoom to discuss the ideas and the relevance of each of the user stories. We also compared our new user stories with the earlier deployed slides and what all differences the 2 versions would have.

Iteration 1:

Requirements: In this iteration, we got clarity on requirements with respect to the hint system of this legacy project. We met the customer (Prof. Walker) to get clarity on the hint system. Based on that clarity, we made changes to the LoFi UI, user stories, pivotal tracker.

Deployment: We've got an email from supervisor of Daniel Shuta, (nritter@cvm.tamu.edu) and for deployment we will contact them in further iterations. We know that the deployment on Stepstone and Peer website has dependency on Daniel and Samiksha respectively. We've gone through the previous teams documentation regarding deployment tutorials and deployment will be done in the next iteration since it has dependency on people outside the team.

Testing is to be done manually, as discussed with Prof. Walker in the first meeting.

Developed code for User stories 4, 6, 7. Created User stories 12, 13, 14.

Iteration 2:

In this iteration, we figured out how to test each deployment independent of each other, which will make it easier to develop new features. We also made significant progress on user stories and will be deploying them after getting in touch with Daniel Shuta. After testing some of the developed slides, we ran into a few new issues. The website didn't scale well for devices like mobile phones and tablets. Also the iFrame on the StepStone environment didn't expand to display the entire view of the website. This was causing the viewer to only see the website partially. We created new stories to fix these issues in the next iteration.

Iteration 3:

In this iteration, We were trying to figure out a way to deploy on WordPress and we made progress on testing it locally using the server press environment(emulates wordpress website). Similarly, testing for the stepstone environment is done using futuredogter(emulates stepstone environment). We also implemented hint systems as part of user stories. We contacted Daniel Shuta for the Stepstone deployment of user stories and deployed slides on StepStone environment .We also had a meeting with samiksha to deploy the user storage to the Wordpress production site. There were a few issues here such as inconsistent numbering of folders and javascript errors due to the presence of HTTP instead of HTTPS, which we managed to fix. There was a considerable amount of time spent on learning the methods for deployment on Stepstone and about the testing on the local server press environment.

Deployment

<https://vetmed.tamu.edu/peer/one-health/> (Stepstone and Wordpress Deployment site)

There are 2 targets where the slides are to be deployed. And there is 1 testing environment for each. Tabulated as:

	Stepstone	Wordpress
Testing Deployment	(FutureDogter) Instructions given here: Page 15 of the following report https://github.com/cwrothrock	Serverpress

	/Animations-in-Stress-Learning-Content/blob/master/documentation/Spring2020/FinalReport.pdf	
Final Deployment	(Stepstone) https://stepstonelearning.net/directPortal/playerShell.php?org=CET&sys=public.Latest&pool=TAMU-NIH-1&resource=SEPACellBio	(Wordpress) https://vetmed.tamu.edu/peer/cell-biology/

a. FutureDogter

The instructions for deployment are given [here](#)

b. Serverpress

This is for local deployment. This simulates wordpress deployment. Before asking Samiksha (point of contact for wordpress deployment), it is necessary to deploy on Serverpress first and test it.

Serverpress installation steps:

1. <https://docs.serverpress.com/article/44-installing-desktopserver>
2. Start serverpress server
3. Install File Manager Extension
4. Upload the folder having the files with index.html file
5. Next go to the local serverpress foldername/index.html
6. Test manually

c. Wordpress

1. Provide the github repository link to Wordpress Point of Contact (in our case Samiksha)
2. They will upload. Finally test again manually for different aspect ratios.

d. Stepstone:

- i. Once the futuredogter testing on sample1 is done, upload the folder by following similar steps but change the ppj value as follows:
- ii. Ppj value: This was the hardest part of figuring out how to deploy slides into the production step stone. Daniel Shuta requires a "ppj" value for each slide which represents its unique position in the step stone environment to deploy the slide into production. This value for existing slides is not documented anywhere and even Daniel could not tell us these values. In the end we debugged the source file for the stepstone website to figure out the ppj values for each "step". This value is present as "id" in one of the "div" wrappers in the for slides. The main

reason it was this hard to figure out was because the website uses the same URL for different views.