

## Part I: Descriptions

### **1. Functionality and Features**

Habitat is a virtual learning environment that allows kids to interact with and learn about their favorite critters. Interaction is encouraged by allowing users to select information by dragging and dropping cartoon animals. Feedback is supplied in the form of animations, highlighting, and a tabbed box containing multi-media information. Users can read about critters, look at real-life images, and even watch informative videos. In addition, a “Habitat Picker” button allows users to navigate between different environments.

Beyond the physical functionality and features, Habitat’s code is designed for extensibility. Additional critters, tabs, and media are simple to add. The tabs’ content could easily be modified to incorporate learning activities, games, or quizzes.

### **2. Technology Used**

Habitat is a dynamic web application built from HyperText Markup Language 5 (HTML5), Cascading StyleSheets 3 (CSS3), and JavaScript. These technologies were selected based on their increased popularity, support, and capabilities in modern web development. Our prototype was developed in Google’s Chrome web browser; however, it is compatible with newer versions of Mozilla Firefox, Internet Explorer, and Safari.

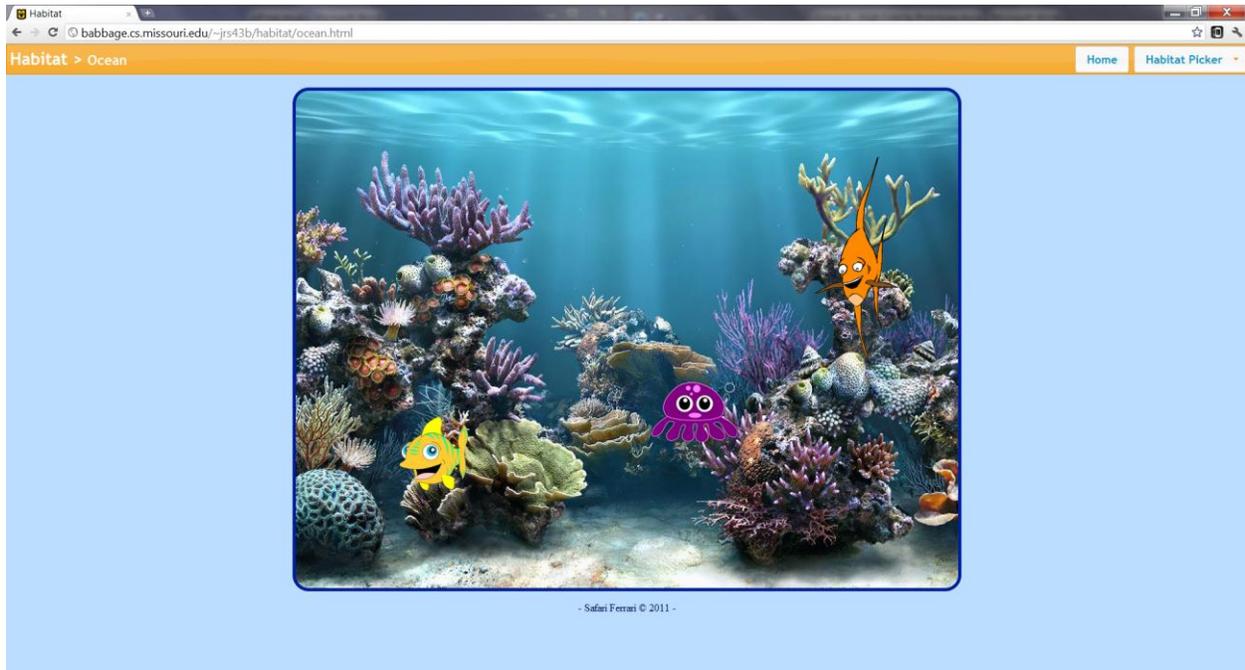
The jQuery User Interface (UI) JavaScript Library was used to add interactive elements and behavior to our prototype. It provided the tab widget that organized each critter’s information as well as the ability to drag and drop items.

The benefit of using these modern web technologies is that they are increasingly multi-platform. With tools like PhoneGap (<http://phonegap.com/>), our project could easily be ported as a mobile application. This would allow us to reuse our code on various platforms, including the iPad, iPhone, and Android devices.

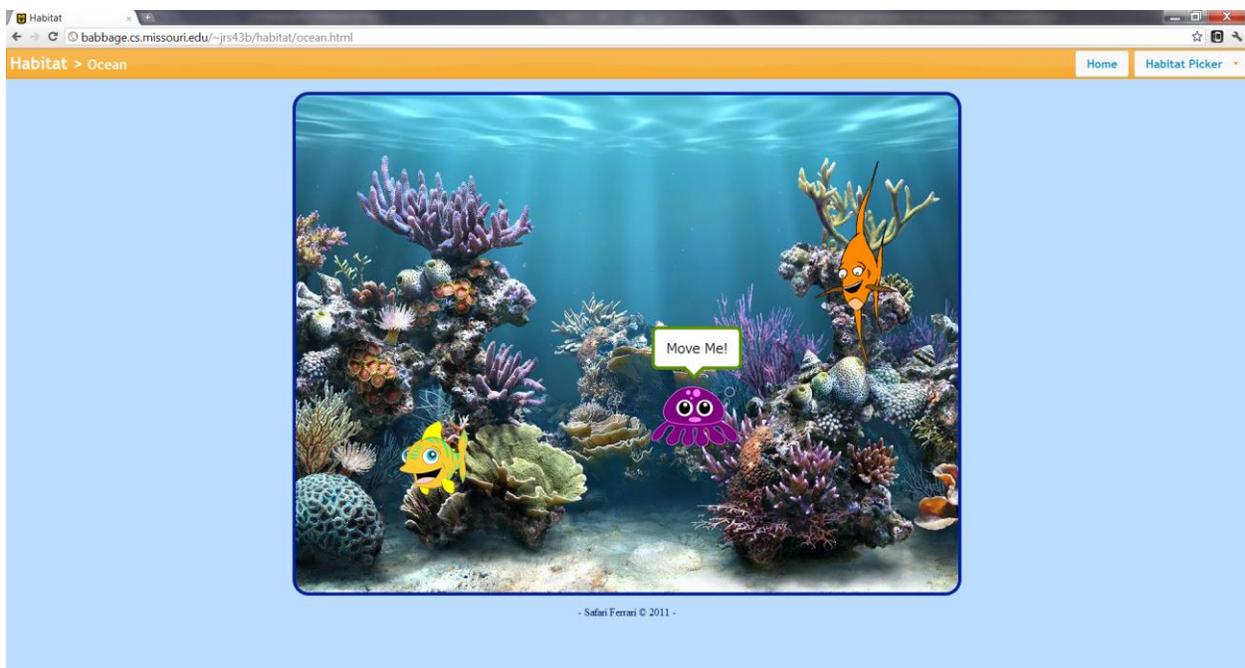
### 3. Prototype Images

The following images depict a sample interaction with our prototype.

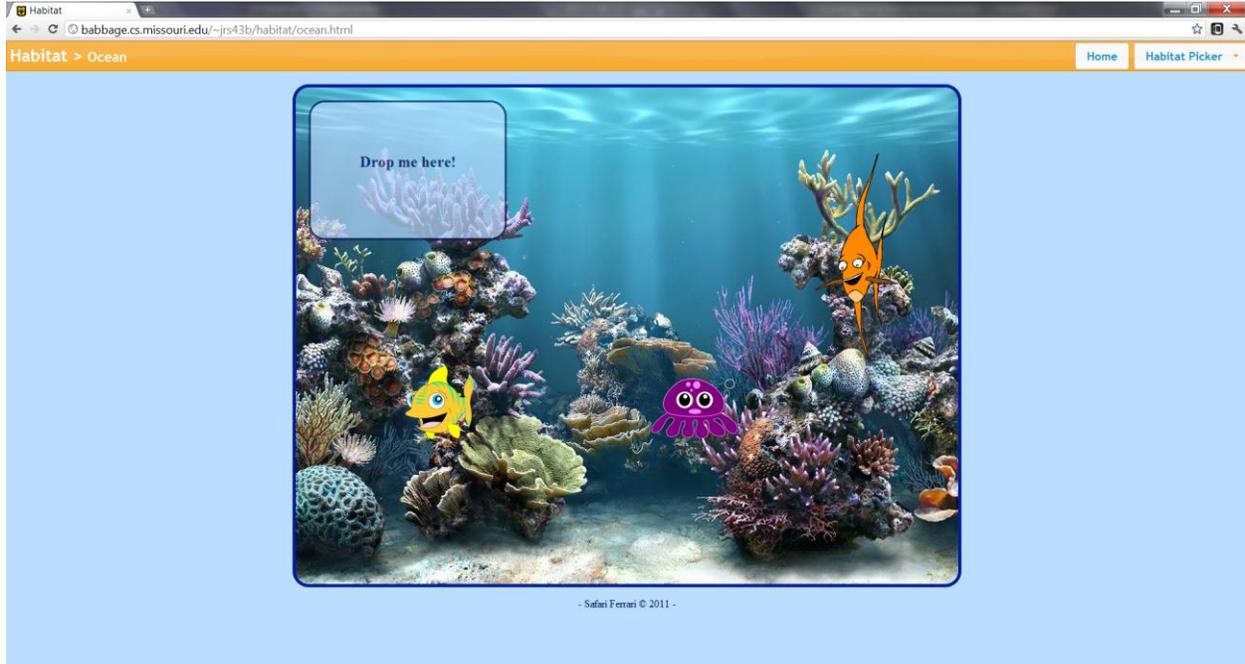
The user is greeted by an ocean habitat containing 3 cartoon critters.



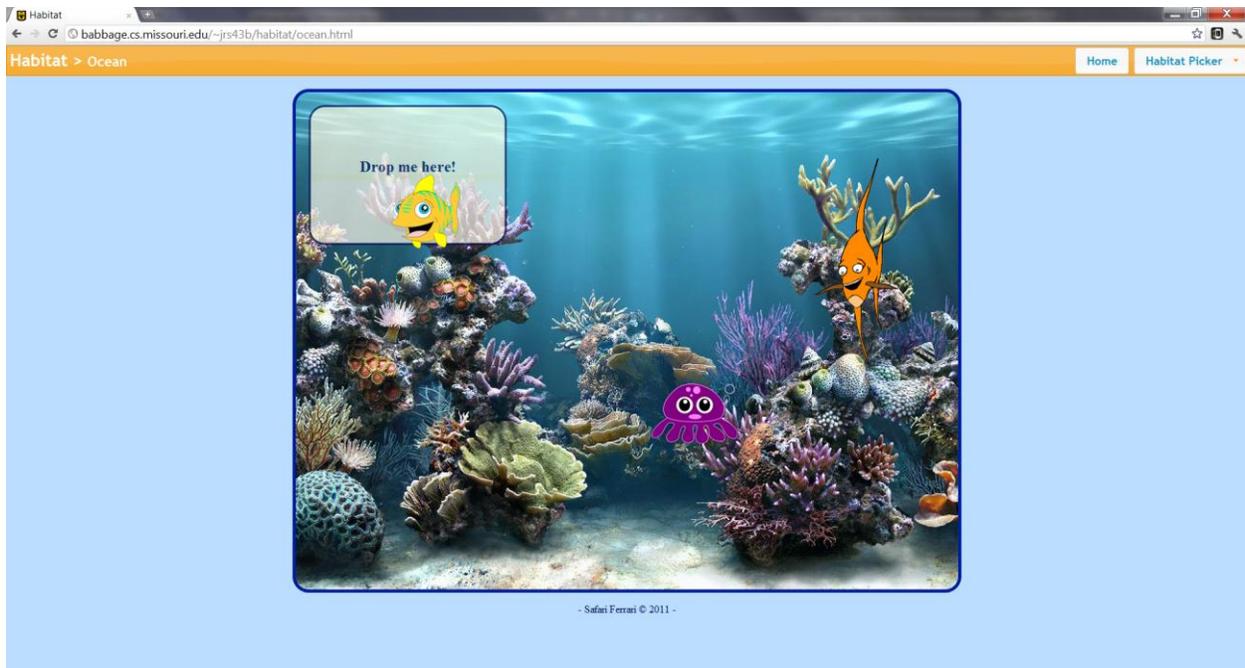
If the user is visiting the site for the first time, they may not know how to interact with the critters. Thus, after 8 seconds, one of the critters will prompt for interaction.



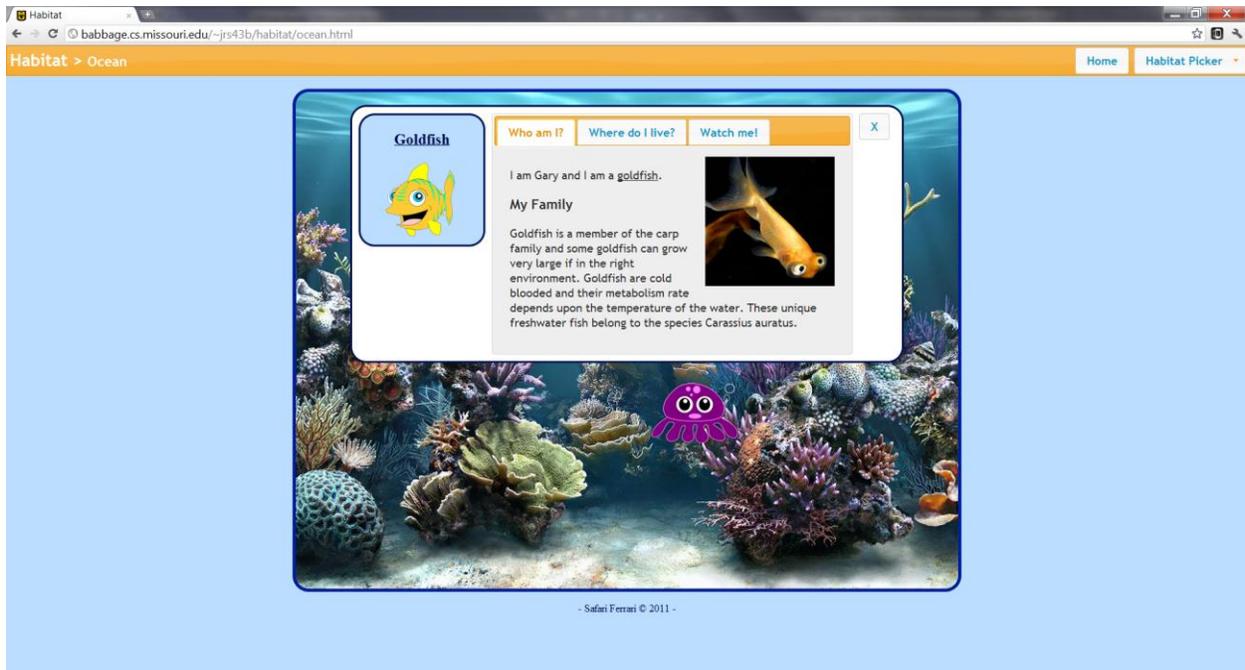
Once a critter is selected, an animated box appears labeled “Drop me here!”



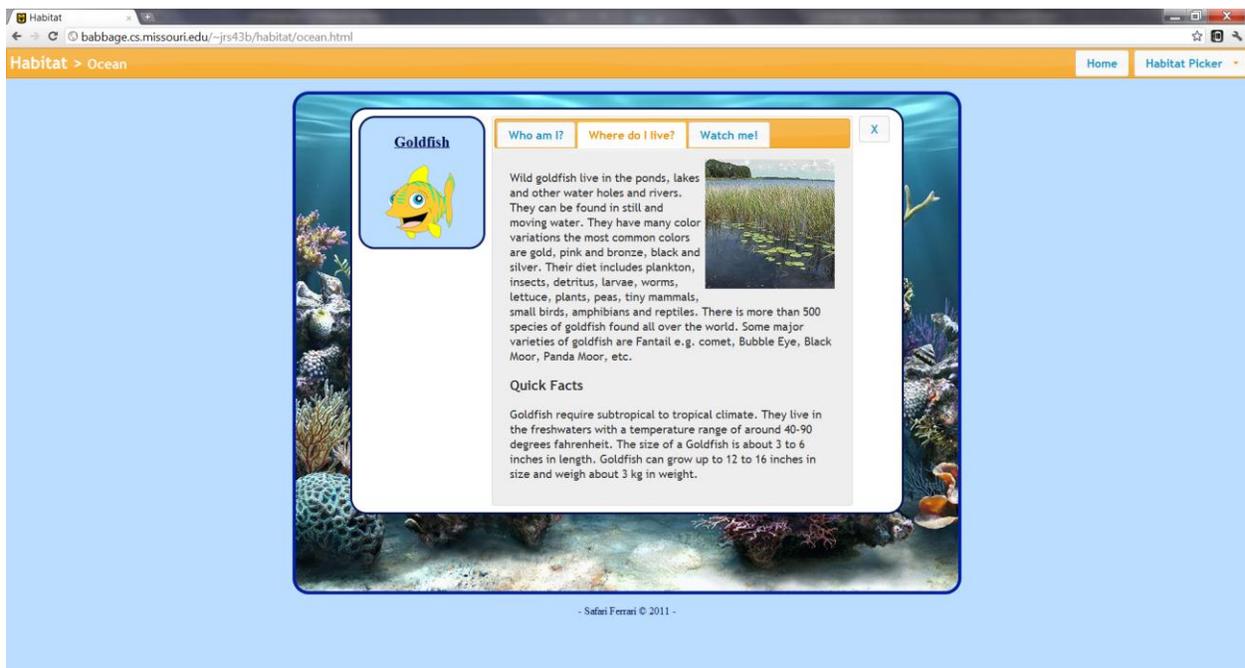
When the user hovers over the box, it is highlighted.



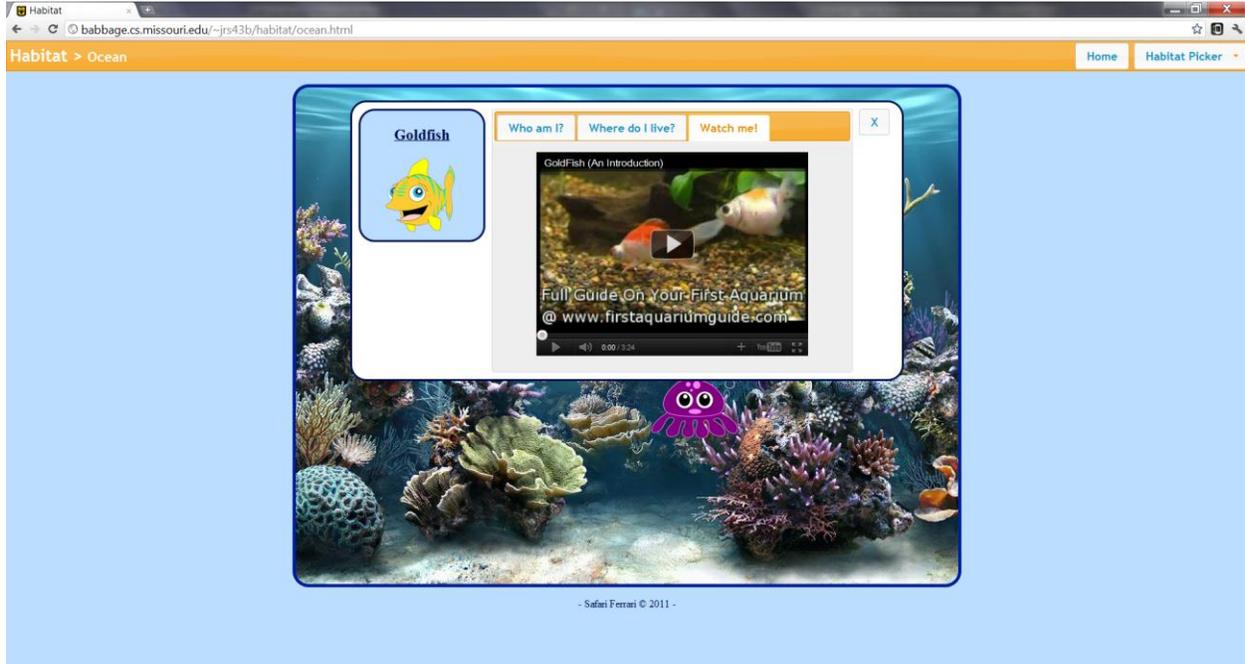
Dropping the critter inside the box causes an information panel to slide into view. The panel includes details about the critter organized into 3 tabs: “Who am I?”, “Where do I live?”, and “Watch me!”



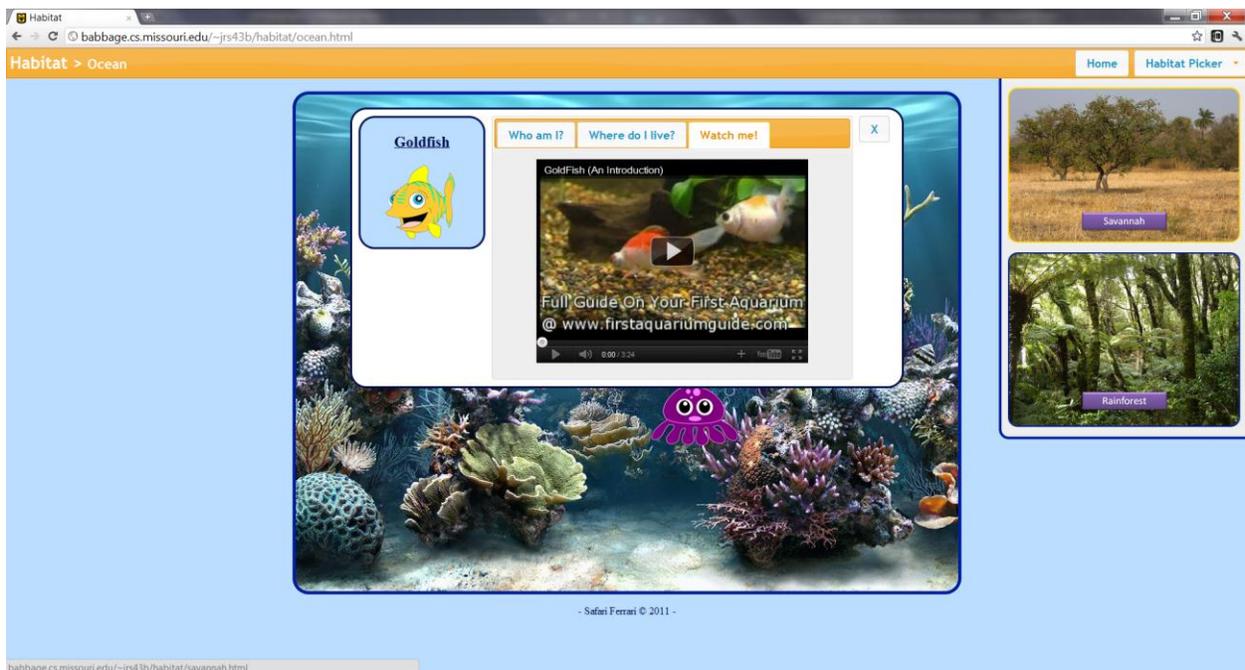
Clicking on the tabs dynamically loads new media.



The “Watch me!” tab features an educational YouTube video.



Once the user is satisfied, they can either click the “X” to close the information panel and repeat the process with the other critters or they can click on the “Habitat Picker” button to select a new environment to explore.



#### **4. Unimplemented Features**

The following features were not implemented in our prototype:

- **Additional Critters:** we wanted to include a variety of critters, but the process for collecting text, details, and media for each critter is time consuming. We decided to use an example group of 3 critters and concentrate on other aspects of our design.
- **Additional Habitats:** we designed our code so that additional habitats would be easy to implement; however, again the process was time consuming. We wanted to focus on improving the interaction of our original ocean habitat first.
- **Quizzes and Games:** our objective was to create a virtual environment where kids could come to learn. Part of that involves reinforcing material through fun and interactive content (like quizzes and games). However, that content went beyond the scope of our prototype. We supplied a couple of different media types (text, images, and video) to show that the content could incorporate anything in a finished product.
- **YouTube Controls:** Currently, if the user starts a critter's video and either switches tabs or closes the information panel, the video will continue to play. We experimented with JavaScript code to control the video, pausing it while moving between tabs, resuming playback, and stopping the video upon close. This code worked successfully, but unfortunately was not compatible with Firefox. In the end, we decided that compatibility was more important than solving video control.
- **Using a Net to Collect Critters:** one suggestion mentioned the idea of collecting critters with a net. We attempted to implement this by changing the user's mouse cursor; however, we found this to be unfeasible as each web browser limits the size of the cursor image. As an alternative, we changed the cursor to a pointing hand when the user hovers over a draggable fish. The cursor again changes to a "grabbing-hand" once the user drags the fish. Both changes were done to improve feedback when selecting critters. In another instance, we tried changing the "drop me here" box to an image of a net; although, we were not able to make it look as nice or perform as well as the original drop box. Instead, we decided to add an animation to the box, in an effort again to improve visual feedback.
- **Build-Your-Own-Habitat Mode:** Ryan Babiuch and Jessica Kohler both presented excellent ideas about allowing users to interactively create their own habitats. We really enjoyed these ideas, especially considering that it would allow instructors to use habitat as a tool to deliver their lesson plan. Of course, this mode was considered, but ultimately unimplemented because of its time-intensive scope.

## Part II: Prototype

Our prototype can be accessed by following this link:

<http://babbage.cs.missouri.edu/~jrs43b/habitat/ocean.html>

**Note:** All of our prototype's buttons and links are functional; however, we did not implement a home page or the savannah and rainforest habitats. Those links lead to empty pages. Our focus was directed towards the ocean habitat (ocean.html).

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## Part III: Peer Evaluations

We received the following feedback on our high fidelity prototype:

### Drew Mcallister

Marguerite, Justin, and Garon,

What a wonderful project! It made me want more habitats to investigate! My feedback is below. I hope we get to see the finished product.

-- Drew

#### 1. Does the design support user goals and tasks?

The design supports user goals and tasks quite well. I agree with earlier feedback that users might benefit from something that invites interaction, even if the invitation didn't tell exactly what to do. I rather like the sense of discovery that "finding" the tray involved. Something as simple as "Explore Our Habitat!" would suffice for me.

#### 2. Does the interface provide a sense of context for location within prototype or number of steps in a process?

I did not know where I was without reading the project outline. Though the "Home" and "Habitat Picker" buttons exist, since these do not go anywhere I was left thinking that they were extraneous to the project. After reading the description, I'm still somewhat unsure what the difference between "Home" and "Habitat Picker" might be. Perhaps a label at the top describing the present habitat would let the user know that this is one of many habitats. For example, this habitat might be labeled "Ocean Habitat" just above the interaction window.

#### 3. Are the interactions intuitive?

The interactions are perfectly intuitive, once a user clicks on a critter. Prior to that, a user must make predictions and explore (see my comment on question 1).

4. Is the visual design appropriate for the target audience?

The visual design is quite appropriate for an elementary audience. I especially like the mix of cartoon characters, descriptive text paired with authentic pictures, and short video clips. A nice, exploratory interface.

5. Does the overall design have any confusing aspects or unnecessary complexity and cognitive load? If so, provide details.

I would have liked some “cue” to begin poking around (see my comment on question 1).

6. Review heuristics on pages 506-509 for other elements that may be applicable for your evaluation.

I think the “match between system and real world” might be improved upon. While the “examining tray” is a nice metaphor in its description, the shape that appears in the water didn’t call to my mind anything about a “tray”. It was merely a target into which I had to place the critter in order for something to happen. Aquatic “examining” tools that come to my mind are nets or flashlights, though this would reverse the current interactive actions (i.e. a user would use the net or flashlight to “select” a creature to examine). Also, changing the examining tool based on the habitat might disorient a younger user, though it might also engage an older one. Though time may not permit a change of this degree, revisiting the idea of the match between system and real world might improve the look or operation of the “examining tray.”

## Brian Briscoe

Nice job, Group 1. Very nice product.

1. Does the design support user goals and tasks?

Yes it does for the sea creatures that are depicted. I would have liked to have seen more creatures.

2. Does the interface provide a sense of context for location within prototype or number of steps in a process?

Yes, it’s a very simple interface. Windows open over the current window, eliminating confusion of where a user might be in the site. Very well done.

3. Are the interactions intuitive?

Yes, so long as the user speaks English. All prompts are done in English, some without accompanying graphic. Perhaps a graphic would make the product even more useful for users who are unable to read or do not speak English well.

4. Is the visual design appropriate for the target audience?

100%, absolutely, yes! What a great design for children. From the age-appropriate animation to the overlay styling of the boxes, this design screams "child." Teachers of children are accustomed to seeing products designed for children, so this should be no problem for them, either. Super!

5. Does the overall design have any confusing aspects or unnecessary complexity and cognitive load? If so, provide details.

Only two things confused me. I could not get the link to work for the Habitat Picker (if that is designed to be a link. It is either a broken link or confusion as to what that box is supposed to do. Also, I did not receive any instruction until I hovered over a fish. Some dialog bubbles might help make initial interaction more clear. Both things are very minor in my eyes.

6. Review heuristics on pages 506-509 for other elements that may be applicable for your evaluation.

Some positive feedback to close. I really like the implicitness of the design. It eliminates the need for recall on the part of a user because it is so basic. All options are visible and instructions are clear. I also like the way that the design empowers the user, given him/her control over what happens on the screen. Very nice product.

## Douglas Kueker

Your prototype is FUN and educational! As far as e-learning interactions go this is excellent. Nice work. Here's some feedback to consider:

- The interface is very well composed and organized. The overall design is appropriate for the target audience.
- The information architecture of the learning object is simple and intuitive. Especially the sections that provide additional information about each "critter." Well done!
- One question, what is the educational objective you're trying to achieve? Are learners supposed to do something specific with this information? Depending upon the objective, you could add additional elements such as a cognitive guide character to direct learners' attention, prompt what to do with the information, or provide help/support as needed. (I could see teachers asking for a lesson plan to help use this in their classroom.)

- The learner may need a subtle nudge to know what to do next when they arrive in each habitat. Right now, the learner must guess what to do. While the simplicity of the interface imposes a minimal cognitive load in figuring out what to do this issue could be completely eliminated by providing a subtle cue, or signifier, regarding what to do once the page loads. For instance, after 3 seconds of no activity perhaps a thought bubble appears from one of the “critters” with a message that says, “Pick Me First.”
- As far as Information Architecture goes the site is well designed and straightforward. Here are a couple thoughts that might offer a slight improvement. According to Lynch and Horton (<http://www.webstyleguide.com/wsg3/3-information-architecture/4-presenting-information.html>) users typically look for the home links in the top left of a site. Perhaps the home button might be better placed at the left of the header. Also, it might be helpful to see the name of the selected habitat next to home (e.g. Home > Ocean, or Home > Savannah, etc.) This might help young users better understand the overall structure and their current location (even if it isn’t a very complex design).

## Jessica Kohler

Great project guys!

### 1. Does the design support user goals and tasks?

I definitely think it does. The activity can be scaled from individual participating, to group presentations and collaborative participation. I think in talking about scale, it begs the question of if it might be possible to scale the information to be applicable to different grades and education levels. It could be something as simple as the amount or types of information you include or the amount of detail you provide. I really like the feedback or idea of having resource pages for teachers so they can take some of this and customize it for their students.

### 2. Does the interface provide a sense of context for location within prototype or number of steps in a process?

I definitely think it does. You have a simple layout that places navigation in familiar and easy-to-spot areas. You’ve made it easy to find where they should go for more habitats and to return to the home page.  
Great job!

### 3. Are the interactions intuitive?

I definitely think your interactions are intuitive. You kept your presentation simple, and the tasks very focused so there is little opportunity to cognitively overload your audience, no matter how young they might be.

### 4. Is the visual design appropriate for the target audience?

I definitely think the visual design is appropriate for your target audience. The illustrations are large and the navigation buttons are contrasting enough to be easily readable, even with a busier background. You’ve given them plenty of room to click, plenty of area to land in, and the ability to see their options clearly.

### 5. Does the overall design have any confusing aspects or unnecessary complexity and cognitive load?

If so, provide details. In thinking of your target audience, I have to agree with Drew that some cues, whether it be text-based directions or icons might help cue them as to how to start.

**6. Review heuristics on pages 506-509 for other elements that may be applicable for your evaluation.**

In reviewing the heuristics, there are a few little things that might improve the quality of use. To improve 'visibility of system status' what if the icons had some kind of highlight around them when they were being "grabbed" so that younger users received some feedback, or response to their activity? I also agree with Drew's idea of making the tray more "tray-like" or incorporating imagery of tools that might actually be used in the investigation of these species/habitats.

I might have missed it, but are there any plans/coding in place for error notification/prevention. I dragged one of the icons around without dropping it into the tray and didn't see anything.

Again, great work! This would be great on a tablet (other than iPad obviously).

## Dr. Joi Moore

Great feedback provided by peers.

I agree with Drew's suggestion of having a net to collect a critter, then you would receive the information. Also, to make it more interactive, you could have the critters moving in the scene. Very slowly so that they are easy to catch. :-)

This would make it more like a game to the kids.