Wild Kratts Interactive

PBSKids Virtual World Game

Creature-Mobile

Concept Document

November 2013

Created and Developed by Kratt Brothers Company

Creature-Mobile

Just imagine where the Kratt Brothers would be without the amazing inventions created for them by their friend Aviva. From Amphisubs to Cheetah-Racers, Wormmobiles to the Butterflier XT, Aviva has uses the knowledge of the Wild Kratts about how different animals' creature powers help them move and thrive within their habitats to build some incredible adventure vehicles, and now you can demonstrate your creature know-how to help design and build her latest and greatest ride: the Creature-Mobile!

The Creature-Mobile is a new, modular vehicle that can use different creature-inspired attachments to go pretty much anywhere the Kratts need to go, on land, sea, or in the air. The trick is figuring out which features are best suited to which types of terrain and environment, and adjusting the Creature-Mobile's configuration for maximum adventure power.

The more you race and win, the more you'll learn about creature powers and the more in-game features you'll unlock for your racer.

- *Target Audience:* animal lovers aged 6-10
- *Technical Details:* built in HTML5 to work on desktop and touch devices within the PBS virtual world as well as living on the Wild Kratts sites (standard and mobile)

A Race Between Inventors

In this game, the fiendish Zach Varmitech has challenged Aviva to a race to prove who's the best inventor, pitting his Zach-Car against her Creature-Mobile. It's up to you to help Aviva outfit her vehicle with the right abilities to suit the terrain they'll be racing in, then help the Kratt Brothers to use those abilities in a head-to-head race against Zach.

The game has two parts:

1. *Optimizing the Racer* -- based on a description of the terrain in which you'll be racing, you need to work with Aviva to customize the Creature-Mobile for optimal performance potential in that environment. This means selecting the different animal-inspired attachments that will help it move better through the environment (wings, flippers, feet), as well as the type of engine and other elements that will make it work better, all while balancing considerations like weight and speed.
2. *Racing the Racer* -- once you've equipped your Creature-Mobile racer for the match, it's time to race it against Zach. As you race, you'll need to choose the optimal path through the environment based on the different abilities you've given your racer, triggering various features at the right time to overcome obstacles.

A Systems Thinking Game

The Creature-Mobile is designed to promote Systems Thinking every step of the way. The two aspects of the game offer a linked cause-and-effect interaction that is directly related to the choices and actions a player makes.

First, when building the racer players need to consider the possible outcomes of different configurations, not only choosing the right method of locomotion but also ensuring the racer has enough of the right kinds of power, isn't too heavy, has some defensive capabilities, and so on. Then when racing, they need to find a path through the environment that allows their customized racer to perform to its full potential, choosing when to trigger various abilities to get the optimum results.

- Players are always balancing two or more elements, for example using their vehicle's abilities consumes some of its power; they need to manage power consumption with the need to trigger different features in order to reach the finish line
- Players see how each element in the game exhibits a behavior, for example different features for the vehicle allow it to overcome different obstacles and different obstacles impede progress in different ways; the player will learn develop strategies for choosing which obstacles they wish to face and which they will avoid to optimize their race to the finish
- Players can see how changes in one aspect affect behaviour in the others, for example the choices they make when optimizing their vehicle will directly affect where their vehicle will be able to go when racing
- Players will also employ Futures thinking in balancing how different game elements interact to produce different outcomes, for example when they encounter terrain obstacles that their vehicle cannot overcome, a Kratt Brother advisor will comment on how a different outcome could have been reached: "if only we had the spider legs power we could climb that cliff…"
- Players are encouraged to replay the game over and over to develop Strategic thinking, trying different configuration and approaches to the race, seeing how these different actions can change the state of the game and produce different outcomes, for example a player might choose fast-flapping and maneuverable bat-inspired wings one time, then the next time they play try wide soaring hawk-inspired wings the next, seeing how that affects their power consumption and speed when racing. Experimenting with the various options and attachments makes the game highly replayable across multiple sessions.

The game is designed so that the systems thinking approach complements the core STEM curriculum and fits within the overall educational goals of the property. The core STEM curriculum concept covered in the game is *FORM FOR FUNCTION: Animals have certain features that help them survive and move in their environment (National Science Education Standard C)*. Throughout the game, the player is required to think about the various kinds of physical adaptations that creatures have for movement in their home environment and the various trade-offs that are associated with those features both in that environment and in other, different environments. For example, a walrus has fins that are great for moving around in the water, but they make it very difficult to move around on land.

Immersive Game Perspectives

The game attempts to immerse the player in the game through perspectives and views that are first person in nature.

- *In the Workshop:* While building the racer, they'll find themselves inside Aviva's workshop, seeing the various parts they can attach to the racer and viewing on her viewscreen a diagnostic that shows how the addition or removal of various parts affects the overall performance potential of the vehicle.
- *On the Race Course:* While racing, they'll be looking out of the cockpit of the racer, with their control panel visible offering the controls for activating various powers and another viewscreen showing the current status of the racer. Not only is this provide a very active, immersive feel to the gameplay, but it sneaks around the issue of having to render an animated visual representation of the Creature-Mobile with its multitude of possible configurations.

Game Flow

Stage 1: Map Selection

Each game will begin with the selection of terrain. There are many possible environments in which we could challenge players to race, each with possible variables:

- On Land -- through desert, or forest, or mountains, or savannah, or frozen arctic
- Under Water -- through deep ocean, or whitewater river, or calm lake
- In the Air -- through high mountain air currents, or urban tower-filled updrafts
- Underground -- through networked tunnels or caves, or digging new tunnels

Within each terrain type, we will have a number of maps the players can choose from. Some maps will be naturally harder than others by providing more obstacles, different terrain elements, and other variables to challenge the player.

Expansion Potential

We will launch with only one or two environments to begin with, keeping others for future expansion. The number/length of maps at launch will be determined by the final scope of the game. We will also keep all but one or two maps in each terrain locked at first, challenging players to work to unlock them through in-game achievements.

Environmental Parameters

After the player chooses the map they wish to race in, we would tell them any special parameters in effect that may impact the choices they make in customizing the vehicle. These parameters are randomly added, offering unexpected challenges each time the game is played. For example, if it's raining they may wish to have a method of mobility that has lots of traction.

Possible parameters include:

- Weather: rain, fog, etc.
- Time of Day: sunny, dark, etc.

- Wind: still, breezy, gales, etc.

Stage 2: Vehicle Optimization

Here players are sent into Aviva's workshop to equip the Creature-Mobile. Given their choice of environment, players will be presented with an appropriate selection of options (i.e. wings if racing in the air, flippers and fins if racing in the water). The player will employ Futures thinking skills in order to predict the possible outcomes of their choices in this stage of the game.

Balancing Factors

Outfitting the vehicle is not as simple as just choosing a few attachments to load onto it. There are two balancing factors they must consider in equipping the vehicle:

1. _Weight_ - each element they add to their vehicle will add a certain amount of weight. Each terrain type will have a maximum weight limit the vehicle cannot exceed, with certain performance bonuses for being lighter (i.e. a lighter vehicle moves faster).
2. _Energy_ - each power will use up a certain amount of energy when used. One of the elements the vehicle needs is an engine, with heavier engines providing more energy. Once energy is used up, the vehicle cannot move, so players must manage this during the race when they choose how to activate their powers.

Engines

The Creature-Mobile must have an engine to provide energy. Several different engines will be available, with a range of possible energy outputs. Generally, the more energy it can provide, the heavier it is.

Locomotion

The vehicle also needs at least one mode of locomotion to move it around. These are mechanical vehicle attachments that borrow from the ways that animals move: a falcon's wings, a sea otter's webbed feet, a spider's legs, etc. More than one mode of locomotion is desirable, as these will allow the vehicle to move easily through various terrain -- what if the player encounters a river in the way when racing through a land-based terrain? If they have the otter's feet they can easily paddle past, or a kangaroo's legs could hop over it, or squirrel legs could climb a tree and a draco lizard's wings could glide across. But if all they have are cheetah's legs, they'll find their terrestrial speed reduced to a crawl as they laboriously trundle across the river bed.

Defence

Defensive powers are optional features, but desirable ones. When players race, they're competing head-to-head against Zach, and we all know he doesn't always play fair. He'll release various Zach-bots to try to impede the player's progress, and that's where certain defences may come in handy. A turtle's shell, a porcupine's quills, a blowfish's spines, even a skunk's stink could all come in very handy at times, and could make the difference between winning and losing.

As the player browses the various attachment options for her vehicle, the animal from whom the attachment is inspired appears on the interface and information about that animal helps the player

predict and ultimately select her various options. These animals will be the familiar animal pals from the show (ie, Blur the cheetah, Pacer the pronghorn antelope, or Quillber the porcupine)

Expansion Potential

As with terrain types, the range of options that are available to add to the racer are another way we can expand the game in the future. Introducing new attachments and abilities, as well as keeping some unlocked until earned through gameplay advancement as obvious ways of keeping the game fresh and providing positive feedback loops.

Stage 3: Racing

Once the player has chosen the various elements they want to add to their vehicle, they move on to the race. Now they are looking through the window of their racer, with a control panel at the bottom showing all the powers they've chosen and a screen giving a read-out of important information: weight, speed, distance, and most important of all, energy remaining.

Steering

Players control the movement of the Creature-Mobile using left/right controls. Depending on the type of locomotion in effect, up/down may be available too.

Pathfinding

It's important to note that within a terrain, all available modes of locomotion will always provide a way of moving through any natural obstacle. The key is that certain moves will offer an easier way of moving. For example, a cheetah's legs will be able to climb up a cliff -- slowly! -- but with a mountain goat's hooves they'd skip up the cliff in no time. Of course, in the plains you'd rather have the cheetah's sprint available, as the goat would skip along much slower in the open.

As players learn the different maps, they'll discover certain strategies that optimize their performance. There will never be only one winning strategy or path, rather a multitude of possible ways of reaching the finish line first.

Activating Mobile Attachments

All the different animal powers the player equipped into the vehicle are represented as icons on the control panel along with the corresponding animal pal. To activate one, the player presses that button. The power is immediately highlighted and an appropriate deduction to available energy is made.

Within the view screen, there will be visual representation of the Creature-Mobile that changes to reflect active powers as well, showing the spider legs extending, or the turtle shell on its back, or wings popping out. This won't be animated, but rather a static view of the vehicle's current configuration.

- *Changing Mode of Locomotion:* only one mode of movement can be in effect at any time. This stays in effect until another is triggered. Each time one is triggered, the energy cost is paid.

- *Using Locomotive Special Ability:* some ways of moving have special abilities, like the cheetah leg attachment burst of speed, or making the falcon-inspired wings flap. Using this ability usually has a dramatic effect on speed, but uses a lot of energy and only lasts for a short time.
- *Using Defensive Attachements:* triggering a defensive attachment has a different effect, depending on the feature. A turtle's shell would stay on until removed, but would dramatically slow you down when active. A skunk's stink would only last for a quick burst, but would cause any animal or Zach-bot in the immediate area to disappear. The energy cost is paid each time the power is triggered (turning it off, when applicable, would cost nothing).

Energy Loss
It's simple: when you run out of energy, you stop moving and lose.

Speed
Speed of movement depends on many factors: your weight, mode of locomotion, environmental things like the wind or mud or strong water currents, defensive powers in effect, and so on. The current speed is always shown on the display, and the player can see when they're moving faster through the environment by how quickly is appears to move past when looking through the vehicle's window.

Distance to Finish Line
Also shown on the display is the distance to the finish line. Keeping in mind that the direct path may not be the quickest path players will always have some idea how far they need to go to finish, as well as if they're moving in the right direction.

Zach
It is a head-to-head race, so the position of their opponent is always a concern. Zach's location on the map will always be visible on the display as well, and if he's nearby you'll be able to see him through the window. His racer will not have the different animal powers that the Creature-Mobile boasts, but will be a more mechanical device that can be loaded with tricks and traps to spring on you, such as oil slicks, smoke screens, attacking zachbots, and other fiendish gizmos.

Zach's performance will be managed by a negative feedback loop introduced into the game to automatically balance the difficulty. It will make the opponent's racer perform better to keep the challenge level high as the player's skill increases.

The Systems Thinking Feedback Loop
The design of the game allows for a wide range of processes related to the systems thinking curriculum and provides a great opportunity for an experimental feedback loop as the user plays and replays the game.

Players will employ Futures Thinking in the design of their Creature Mobile and in deciding which attachment to employ and when throughout the game. Within the race phase of the game, they will be identifying how those system components interact as they learn about the system and begin to understand it more fully. Before long, the player will naturally begin to employ a great deal of Values

Thinking as they determine the attachments that are working well for them and on which they prefer to 'spend' their allotted weight in the building phase.   And as they replay the game and begin to master the system, they will employ Strategic thinking and have an opportunity to experiment with different approaches, paths, and attachment options. This kind of systems thinking feedback loop provides hours of fun and enriching gameplay.

Interaction with the PBS Virtual World Environment

The game design would integrate well with the PBS virtual world environment with the potential for many opportunities to find/earn various rewards in the PBS environment that could then be used in the Wild Kratts game, or vice versa. For example, you could find, earn, or craft a specific Creature-Mobile attachment in either the Exploration space of the Social Space of the PBS environment. Or perhaps find a specific animal in the Exploration Space of the PBS environment which then unlocks an attachment within the Wild Kratts game.

Similarly, it would be possible that you could win PBS VW crafting resources upon successful completion of the race. Or perhaps the user could actually use his Creature-Mobile for a specific navigational event in the PBS virtual world.

A whole range of possibilities can be discussed and coordinated with the PBS virtual world team at the appropriate time and the game can be built to provide the necessary informational output to the PBS virtual world.

Technical Specifications

The game will be built in HTML5 meeting all of PBS's technical requirements. Both the interface and performance will be optimized for the desktop and mobile experiences, working just as well within the virtual world through a 900 x 500 iFrame overlay as it will when access directly through the Wild Kratts site in our Games sections. Communication with the PBS servers will be seamless, integrating fully with the authentication service, including standard reporting of key analytics, using the JavaScript API to send data back and forth to the virtual world and handling CORS with common Best Practice solutions, all while keeping with the PBS GUI guidelines.