Science Warp

Game Design and Best Practice Document

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# Mission

-- Insert mission statement/goals of project here -- //TODO dpt

# Definitions

Science Warp comprises a large number of **units**, which offer additional material on science concepts that help students to increase their proficiency at the site’s **Games**. Successful completion of a Game rewards the student with a **badge**.

## Units

**Units** cover an individual science concept, such as forces, weather maps, or vectors, that support students’ abilities to complete challenges presented in Games. These items include both text and supporting animations and activities to teach and reinforce these individual concepts.

Text in units should target grade-appropriate reading levels for the targeted student grade.

Each unit includes a concluding activity.

Names of units are capitalized (e.g. “Force Unit”).

## Concluding Activity

A **concluding activity** is placed at the end of each unit. For example, the concluding activity for the Force unit allows students to launch several types of fruit into a moving basket.

## Games

**Games** allow students to practice what they have learned, or provide a fun introduction to concepts which students can then explore more deeply. For example, the Sailboat Game will include weather/air pressure visualizations, wind force visualizations, and vector indications to assist students in completion of the game’s goal.

## Badges

**Badges** are provided as a reward to students upon completion of units. Their primary use is to gamify progression through Science Warp’s content. Student accounts will include a “badge book” which will allow each student to visualize the Games they have completed and explore additional content which has yet to be learned.

# Design Guidelines and Best Practices

## Units

Units should include no more than three sentences of text in between animations or activities, and all written text should be at grade level for the target grade (for example, a third-grade level unit should be at or below a third-grade reading level). Each unit should include a concluding activity.

Each Unit will have its own document separate from this GDD that includes the text presented and an indication of a student’s progression through the lesson (order of text items, unit animations, and unit activities, as well as the concluding activity).

## Unit Animations

Unit animations should remain consistent in style throughout all units and should be used to illustrate individual concepts covered by the text of the unit. Unit animations should not attempt to cover more than one small concept at a time. When a character is necessary, Unit animations should feature the site robot.

## Unit activities

Unit activities should highlight individual concepts covered as part of the unit. For example, activities in the Force unit allow students to experiment with individual aspects of the topic covered, including the different effects of the same force on object of different mass.

## Games

Games should make adequate use of all topics covered in prerequisite units, ensuring that requiring completion of such units is meaningful to successful completion of the Game.

# Units

## Force

The Force Unit covers the definition of force and elaborates upon applications and nuances of the concept, including the effects of the same force on object of varying mass.

### Concepts presented

* Definition of force
* More force to move a heavier object and vice-versa
* Effect of force applied to an object on distance that object can be launched

### Unit Animations

* Robot pulling on a door
* Robot pushing on a door
* Robot struggling to push a large rock

### Unit Activities

* Applying different forces (mosquito, horse, Saturn V rocket) to the same object
  + Interactive results
* Applying the same force to different objects (roller skate, bicycle, tractor-trailer truck)//QUESTION – will this also include variable forces?
  + Interactive results

### Concluding Activity

The concluding activity for the Force Unit will be a game in which students are asked to launch fruits of different sizes (grape, apple, watermelon) into a basket. The basket will be randomly placed for each launch to prevent students from sharing solutions without learning through experimentation.

## Weather

Description of weather unit, including requirements, concepts presented, and included animations and activities. See “Force” for formatting.

## Buoyancy

Description of buoyancy unit, including requirements, concepts presented, and included animations and activities. See “Force” for formatting.

## Contour Maps

Description of contour maps unit, including requirements, concepts presented, and included animations and activities. See “Force” for formatting.

## Vectors

Description of vectors unit, including requirements, concepts presented, and included animations and activities. See “Force” for formatting.

# Games

## Sailboat Game

Required Units: Force, Weather, Buoyancy, Contour Maps, Vectors

Description of Game //TODO - discussion

**Badge Earned: Sailor**

[image of badge goes here]

# Asset Design Guidelines

## 3D Assets

Three-dimensional assets for Games, unit activities, and unit animations should be stylized, fun, and appealing. Modeled objects should be textured with bright colors and be easily readable as recognizable objects from the real world.

## 2D Assets

2D assets should retain a similar stylistic goal and feature bright colors.

## Animations

Animations are encouraged to include exaggerated movement and should make use of the Twelve Principles of Animation to do so.

# Site Branding and UI

## Site Branding

### Robot

Robot sketches, design, purpose

### Colors

Colors

### Fonts

fonts

## UI

### Design Guidelines

Guidelines

### Mockups

Mockup images here with notes, descriptions, etc.

# References

## Visual Design References

List here.

## Educational References

Will likely include several academic papers. List here.

## Game Design References

Will likely include several academic papers. List here.

# Project File Structure and Guidelines

Each subfolder in the Unity project is organized by asset type, and divided into a binary based upon what type of interactive Science Warp component they support.

## Activities/Games Binary

Each folder containing an asset type contains at least two subfolders: one for “Games” and one for “Activities.” Several asset subfolders also include a “Common” asset folder, for assets that are used across several components. Each “Games” and “Activities” folder will include a subfolder for each individual component of the type (e.g., the “Games” folder includes a subfolder titled “Sailboat Game”).

## Art

The “Art” folder under Assets contains all art assets for the game. Subfolders include those for animations, models, textures, and UI.

## Audio

All audio (SFX, music, voice lines) used in the game should go in the proper sub-subfolder in this folder. If the number of assets grows to the point where this is necessary, these can be organized at the secondary or n-most level into SFX, voicelines, and music.

## Prefabs

Unity prefabs should be saved to the proper sub-subfolder within this folder.

## Scripts

All scripts should be saved under this folder and organized as is proper.

## Scenes

The “Scenes” folder includes an additional folder for sandbox scenes. Each developer will have a sandbox scene for personal use to test concepts, scripts, and the like. These scenes will be titled with the developer’s initials followed by “-Sandbox.”