Steamboat Wheel

GDD - Map navigation

Overview

The player moves a boat in a flat map and does that by interacting with a system of **nodes** connected by **edges**.

Nodes

A **node** is a visible and recognizable position on the map. The player boat is always placed on one of these nodes, except when the boat is moving.

Normal Treasure Artifact

Nodes can have 3 states: **Normal node, Treasure node**, and **Artifact node**. Every node checks the first time the boat gets on him, so the corresponding place in the obscured minimap can be cleared, (see the UI document for the minimap).
Each node, regardless of its state, contains information about the zone in which it is (0,1,2,3).

Normal

A normal node is a node without any particular function. The player can stay on this node as long as he decides to navigate.

Treasure nodes

When the player boat navigates on a treasure node a pop-up like to one in the figure shows up. If the player taps on the **CATCH!** button the treasure catch minigame starts. If the player taps the X button or outside of the pop-up, the pop-up needs to disappear (in this situation tapping outside of the pop-up must not trigger

navigation). Now the player can tap on the boat to show the pop-up again or click on another node to start navigating.

Treasure nodes can be different in terms of the minigame that each one triggers. We are thinking about a simple difficulty parameter (lvl 1, lvl 2, lvl 3, lvl 4) to use each in a different zone of the map. This parameter will affect minigame parameters and rewards.

After the minigame, the player returns to the map. If the minigame has failed the pup-up still shows so the player can retry the catch. If the minigame was completed a **chest** must appear in front of the screen to be opened (see treasure catch for more details), and the treasure node becomes **disabled**. When a treasure node is disabled the player can't play the associated minigame for a certain period of time (TreasureNodeDisableTime in minutes) and the location appears and acts as a normal node on the map.

Disable treasure Nodes appears and acts as a normal node

Artifact nodes
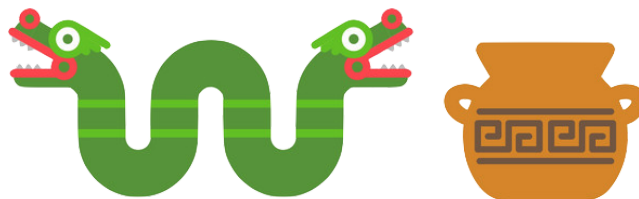
An artifact node acts as a treasure node. The only difference is that at first it appears differently on the map and triggers a different pop-up. When the minigame is successfully completed the reward chest will contain, in addition to the rewards, a specific artifact of that node. After the player has collected the artifact, the node becomes a **disabled treasure node**, and after TreasureNodeDisableTime it will show on the map as a regular treasure node.


Edges

An **edge** is a visible and recognizable link between two nodes present on the map.

Every edge has 2 characteristics:

1) The **type** and **level** of upgrade the boat needs to pass it (no upgrade (tip and paddle level 0), tip lvl 1 or higher, tip lvl 2 or higher, tip level 3, paddle lvl 1 or higher, paddle lvl 2 or higher, paddle lvl 3)

2) the **coal cost** to make the transition (1, 2, 4, or 8). This is calculated based on the two nodes zones whit this formula:
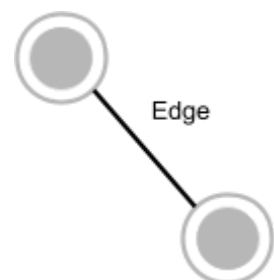
```
coalCost = 2^min(node1Zone, node2Zone)
```

Navigation

When the player taps on nodes adjacent to the one the boat is currently on a check is performed (see Navigation restrictions). If there are no restrictions a navigation cost is calculated (see Calculate navigation cost).
If the player can afford the navigation cost the navigation starts and the boat move from the current node to the selected one, otherwise the boat will not move and he will be redirected to the wheel (if he has at least one emerald) or to the shop (otherwise).

Navigation restrictions

If the edge between the two nodes requires an upgrade to the tip or paddles a pop-up will appear telling what upgrades the player needs to pass it.

Calculate navigation cost

The **navigation cost** is equal to the edge between the two nodes coal cost divided by the ship's **chimney power** (see Chimney).
For example, if the edge coal cost is equal to 4 and the player has a chimney power of 2 the navigation cost will be equal to 2.
The navigation cost can be fractional. For example, if the edge coal cost is equal to 2 and the player has a chimney power of 4 the navigation cost will be equal to 1/2. So starting with 15 units of coal the player will now have 14 + ½ (14.5). This situation is represented by the player having 14 coal remaining and the steam bar filled by ½:

Upgrades

The boat can be upgraded spending gold coins and has 4 upgradable components each with 4 levels that grant different benefits.

Tip
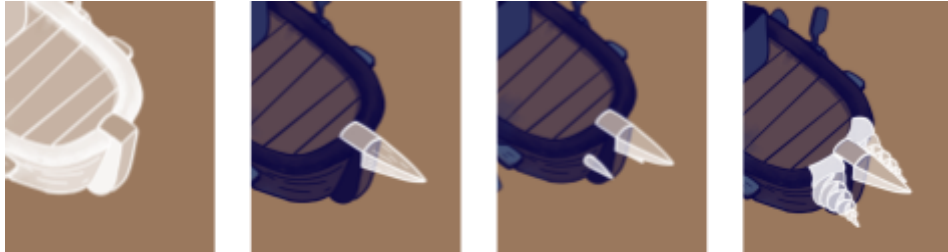
The Tip upgrade will grant access to certain nodes previously locked
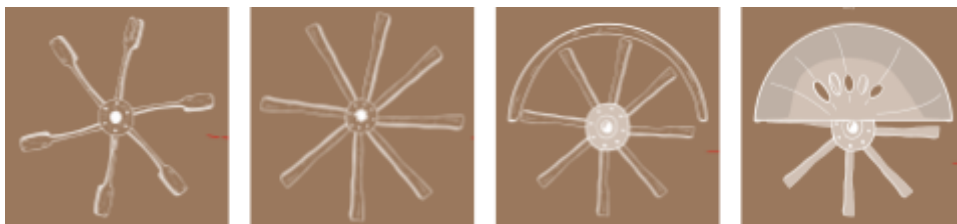Lvl 0 (no upgrades edges),
Lvl 1 (lvl 1 tip edges or lower),
Lvl 2 (lvl 2 tip edges or lower),
Lvl 3 (lvl 3 tip edges or lower)

Paddles

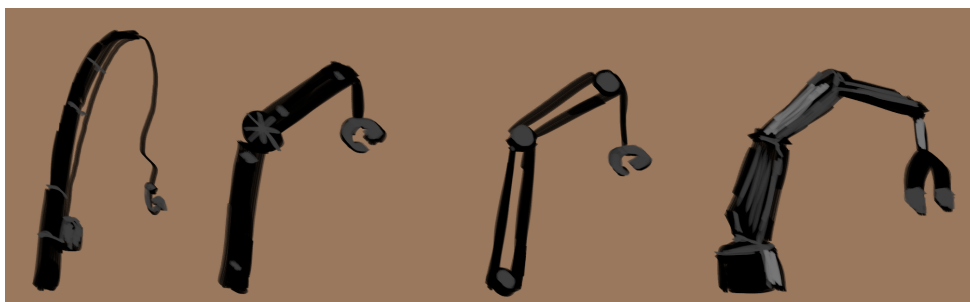The Paddles upgrade will grant access to certain nodes previously locked
Lvl 0 (no upgrades edges),
Lvl 1 (lvl 1 paddles edges or lower),
Lvl 2 (lvl 2 paddles edges or lower),
Lvl 3 (lvl 3 paddles edges or lower)

Arm

Every level will increase a certain percentage value of gold coins that you get from the treasures.
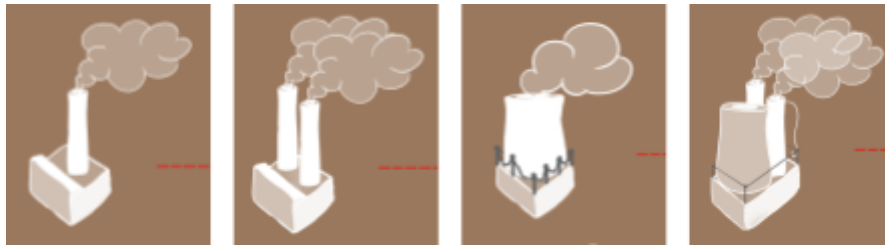
lvl 0: (no upgrades) + 0%,

lvl 1: +x%,

lvl 2: +y%,

lvl 3: +z%

Chimney

The chimney upgrades will increase a value called **chimney power**.

The chimney power for each level is equal to 2^chimney_level:

Chimney level	Chimney power
0 (no upgrade)	1
1	2
2	4
3	8

The chimney power is graphically represented by the number of subdivisions of the **steam bar**.

Level 0 (no upgrades)

Level 1

Level 2

Level 3