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Group 8 Project Requirements & Use Case Diagram

Functional Requirements:

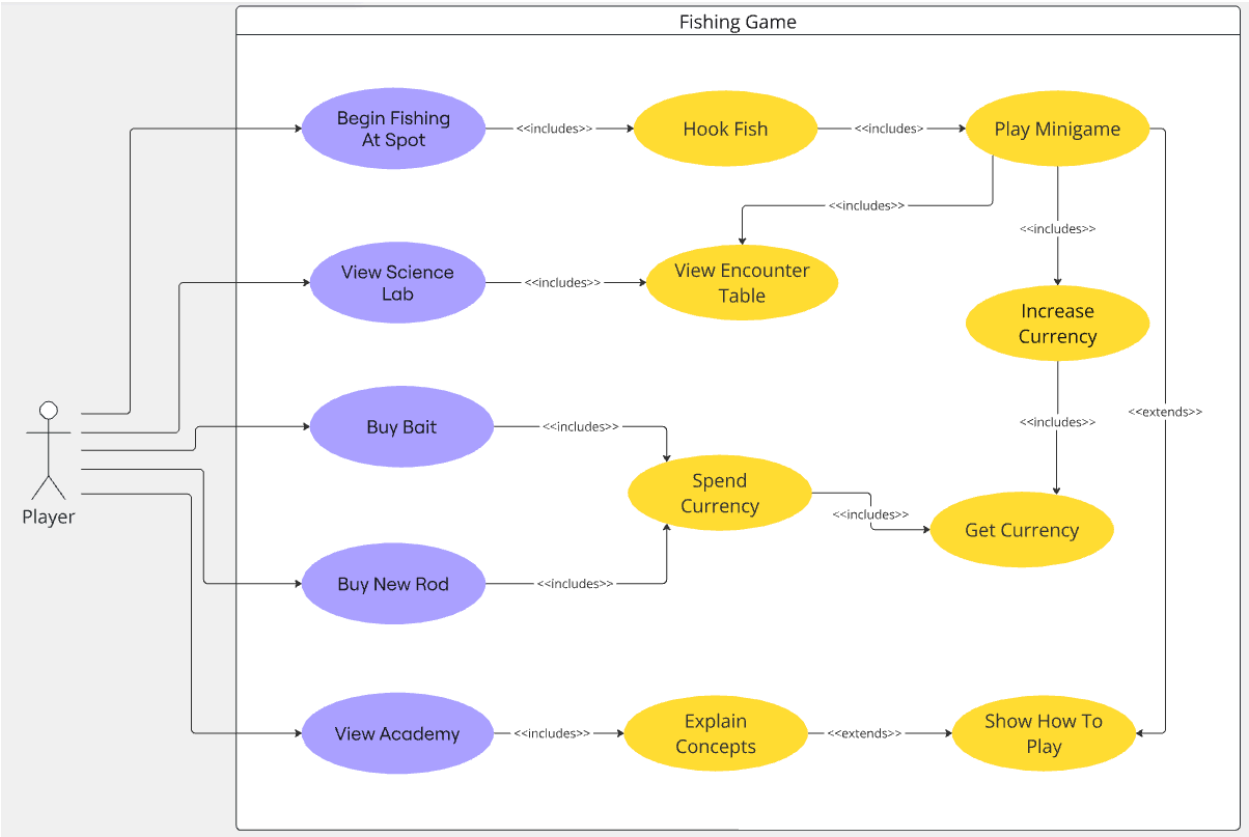
1. Educational fishing game to teach basic angle concepts.
    a. The player will cast a fishing rod to collect different fish.
    b. When casting the fishing rod, the user will wait for an audio and visual cue to let them know that a fish is biting.
    c. The minigame played is broken into four parts.
        i. Timing a hit in a 180 degree semicircle.
        ii. Identifying what type of angle was just formed.
        iii. Calculating the supplementary angle for the line.
        iv. The line placed will extend to make cut outs of a 360 degree circle which the user then needs to find the other two angles using corresponding angle properties.
    d. After completion of the four parts, the fish will be caught. Its length will be determined based on the time it took to complete the minigame and the faster the bigger length which will give you more currency.
    e. After a certain amount of time if the problem is not solved, the fish will break off the line.
    f. The overarching goal of the game is to collect every fish that is available to be caught.
2. Multiple areas to fish in with different fish in each.
    a. Different areas that can be found around the map which offer different types of fish in each.
    b. The fish in each area are determined by an encounter table with some fish being more rare and others more common.
    c. Players will have access to a compendium that will record their progress on collecting all of the fish present in the game. It will be divided by area and also record the highest length of that fish and the number caught.
    d. Different fish will have a small amount of flavor text that explains some information about the species.
    e. Different areas will have a small amount of flavor text to explain a bit about that type of ecosystem.
3. Currency can be gained and spent by the player.

    a. Players will gain currency by catching fish which can be used to purchase different items like bait and new fishing rods.
    b. Items like bait will increase the chance of certain fish appearing in
    c. Different finishing rods will affect the difficulty of the game having harder numbers and less time to solve but will offer better rewards being more currency and increased chance of rare fish.
4. Hub world to explore and walk around in.
    a. There will be a hub world that the player can walk around in and explore that will offer various features to help the player in the game.
    b. The fishing academy will help the player learn the angle concepts needed to play the game along with explaining how the game works.
    c. The shop will allow players to spend their currency on various items.
    d. The science lab will show players the encounter tables for each fishing area to help show players where they may be missing fish.
5. The game must have some kind of entertainment music in the background.
    a. The game must have an option to turn off the background music.

<u>Non functional requirements:</u>

1. The game must be easy to play and learn from.
    a. The game must provide “how-to-play” instructions when the player initially plays the game.
    b. The game must provide help to the user when stuck.
        i. The game must have an easily noticeable “hint” icon that upon clicking displays text to guide the user.
            1. The basic concepts of what is trying to be taught must be displayed.
    c. The game must indicate when it is over.
    d. The game must have an option to restart a level within and after the level is over.
2. The game must have an engaging user interface (UI).
    a. The game must have an inviting and bright visual style.
    b. The game will be a top-down point of view.
3. The game will contain audio and visual cues to aid the player.
    a. The visual and audio cues must play in sync to avoid confusion when playing with no sound.
4. The game must evaluate the user on their performance.
    a. Corrections will be made when the user does not answer correctly.
5. The game should be playable with both a keyboard and mouse but also the option to play with just a keyboard to make it easier to play on laptops.
6. The rating for the game must be E10 or lower.

Use Case Diagram



Use Cases:

1) **Use Case:** Begin Fishing At Spot
    a) **Actors:** Player
    b) **Type:** Primary and essential
    c) **Description:** The player selects one of the fishing spots on the overworld to fish at.
    Perform Hook Fish - Attempt to catch a fish that can be found in the area that the player selected to fish in by playing the minigame that teaches basic angle concepts.
    d) **Use-cases:** Perform Hook Fish

2) **Use Case:** Hook Fish
    a) **Actors:** Player
    b) **Type:** Primary

c) **Description:** After selecting a spot to fish in, the user will wait for a fish to bite and once one does, they will attempt to catch it.
Perform Play Minigame - When the player successfully reacts to a bite, they will play the four phase minigame to attempt to catch the fish.
d) **Use-cases:** Perform Play Minigame

3) **Use Case:** Play Minigame
   a) **Actors**: Player
   b) **Type**: Primary
   c) **Description:** After a fish is biting, the player will play a minigame to catch the fish. This minigame will include timing a hit on a 180 degree semicircle, identify the angle created, finding the supplementary angle, and then corresponding angles will be found.
   Perform View Encounter Table - Before the minigame is played, the encounter table will be viewed and a fish will be selected from that table.
   Perform Increase Currency - If the player successfully catches a fish their currency will increase based on the type of fish caught and length.
   Extend Show How To Play - If the player fails to catch a fish they will be correct on the part they missed to help them improve.
   d) **Use-cases:** Perform View Encounter Table, Perform Increase Currency, Extend Show How To Play

4) **Use Case:** Increase Currency
   a) **Actors**: System
   b) **Type**: Secondary
   c) **Description:** Increases the internal value that represents the player's current amount of currency.
   Perform Get Currency - Gets the value of the user’s currency before adding to it.
   d) **Use-cases:** Perform Get Currency

5) **Use Case:** Get Currency
   a) **Actors**: System
   b) **Type**: Secondary
   c) **Description:** Gets the current value of the user’s currency.
   d) **Use-cases:** None

6) **Use Case:** View Encounter Table
   a) **Actors**: System
   b) **Type**: Secondary
   c) **Description:** Gets information about the fish appearance rates for the area.

d) **Use-cases:** None

7) **Use Case:** Show How To Play
    a) **Actors**: System
    b) **Type**: Secondary
    c) **Description:** Shows the user how to play the fishing minigame part of the game.
    d) **Use-cases:** None

8) **Use Case:** View Science Lab
    a) **Actors**: Player
    b) **Type**: Primary
    c) **Description:** The players enter the science lab which provides information about the fish appearance rates in each area.
    Perform View Encounter Table - Gets the information about the fish appearance rates in an area to display it.
    d) **Use-cases:** None

9) **Use Case:** Buy Bait
    a) **Actors**: Player
    b) **Type**: Primary
    c) **Description:** The player buys bait with the currency that they earn which increases the likelihood of certain fish.
    Spend Currency - After a purchase, decrease the player's currency by the amount of the item purchased.
    d) **Use-cases:** Perform Spend Currency

10) **Use Case:** Spend Currency
    a) **Actors**: System
    b) **Type**: Secondary
    c) **Description:** Decreases the player's currency by a certain amount.
    Perform Get Currency - Gets the user's currency before decreasing it.
    d) **Use-cases:** Perform Get Currency

11) **Use Case:** Buy New Rod
    a) **Actors**: Player
    b) **Type**: Primary
    c) **Description:** The player buys a new rod with the currency that they earn which affects the difficulty of the game and increases odds of rare fish.

Perform Spend Currency - After a purchase, decrease the player's currency by the amount of the item purchased.

d) **Use-cases:** Perform Spend Currency

12) **Use Case:** View Academy
    a) **Actors**: Player
    b) **Type**: Primary
    c) **Description:** The player enters the academy which serves the purpose of holding tutorials and information about the game.
    Perform Explain Concepts - Explain how to play the minigame, and how upgrades and bait work.
    d) **Use-cases:** Perform Explain Concepts

13) **Use Case:** Explain Concepts
    a) **Actors**: System
    b) **Type**: Secondary
    c) **Description:** Explains the math concepts behind the game and teaches the user how to play the game.
    Extend Show How to Play - Show more detail on how the math concepts of the game work.
    d) **Use-cases:** Extend How to Play