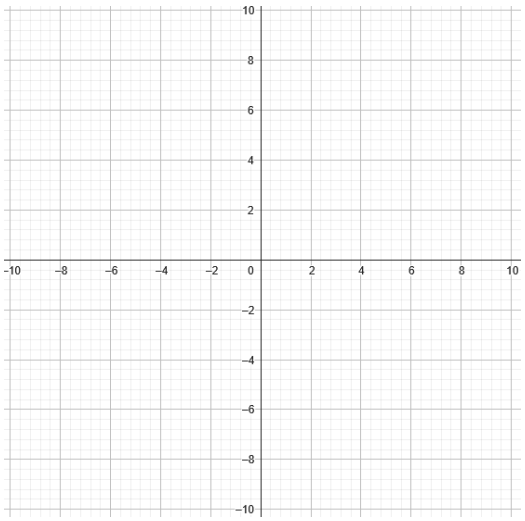
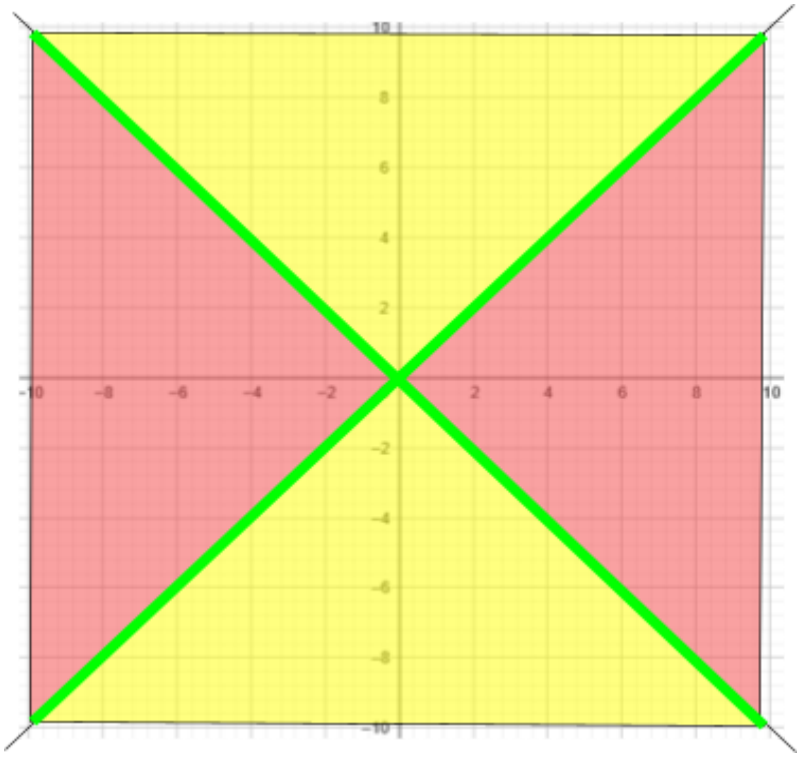
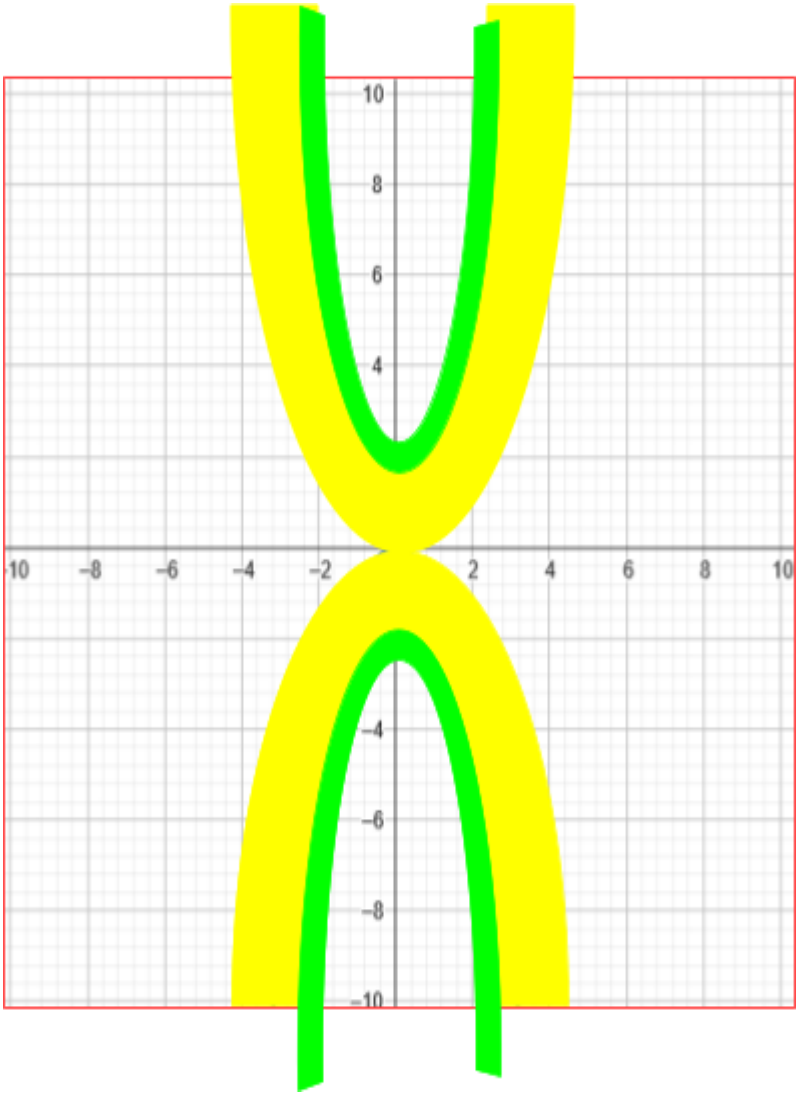
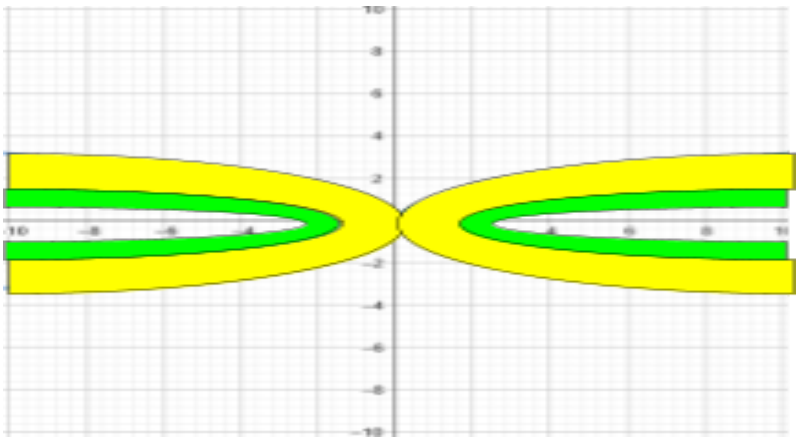
Slope Swing LLD

Core Mechanics






10
8
6
4
10
−8
−6
−4
−2
2
4
6
8
10
−4
−6
−8
−10



Goal / Vision Of How The Main Mechanic Should Be Used

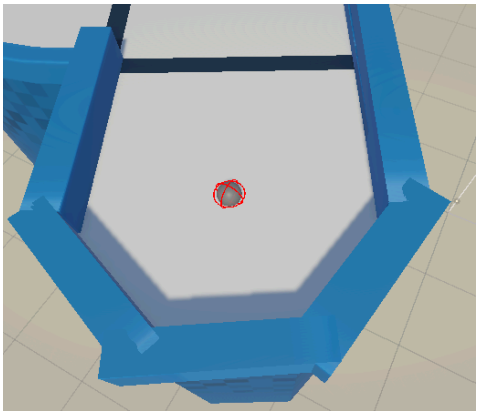
The goal is to get the player to know which area they want to shoot towards in each graph, ***NOT*** the exact number that they need.

- The target hole will be way bigger to make precision matter less.
- Lanes are bigger than normal.
- Not all walls are bouncy. Bouncy walls are their own mechanic.
- Make the par system much more generous, reward those that get very much under par.

Spawn & End

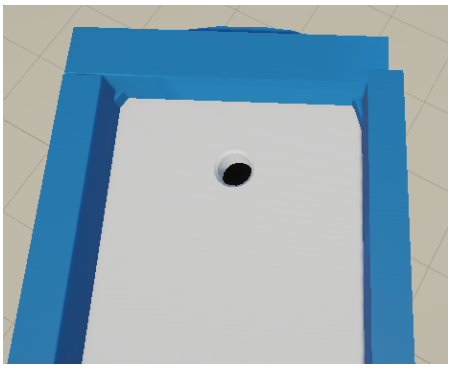
Spawn Area

The spawn area must offer enough space to line up shots without demanding precision. The spawn zone should be at least 5× the golf ball's diameter in width to allow a comfortable first shot. The first section of the hole should be straight to help the players out a little. It doesn't matter which direction it goes as long as it is straight. The spawn zone should never contain any obstacles, interactive objects, or clutter. This is to reduce early cognitive load. Each spawn area should be surrounded by 3 non bouncy walls.



End Hole

The hole should be large and forgiving due to the fact that precise shots are near impossible. This will also help reduce frustration. There should not be any obstacles close to the hole either. This will reduce the feeling of bad luck for moments where the ball moves unpredictably which can be very frustrating. It would also make it harder to hit the ball in the hole since it is hard to shoot precise shots.



Difficulty Curve per Course

Each hole should take 1–2 minutes, for a total of 5–7 holes per course. And an overall time of 10-15 minutes per course.
Start with confidence, build mastery, then challenge with new mechanics, however not with precise shots since this is too hard.
Emphasis should always be on understanding mechanics, not punishing execution.

Hole	Role	Difficulty	Design Goal
1	Intro / Confidence Builder	Easy	Broad straight line, no obstacles
2	First mechanic added	Easy-Medium	Introduce a mechanic like bouncy wall or slope
3	Core mechanic reinforcements	Medium	Require the player to use multiple equations
4	Add an obstacle for timing or extra paths	Medium-Hard	Add a windmill or an alternative pathway
5	Reinforce added obstacles	Medium	Require the player to get through multiple obstacles
6-7	Alternative paths	Hard	Give the player the choice for alternative paths

Rules For Mechanics & Lanes

When you introduce a new mechanic or a new lane it is done so in an isolated manner. After a mechanic or lane has been introduced on its own, it can begin to appear in combination with a single other mechanic after and from there on multiple mechanics at the same time.

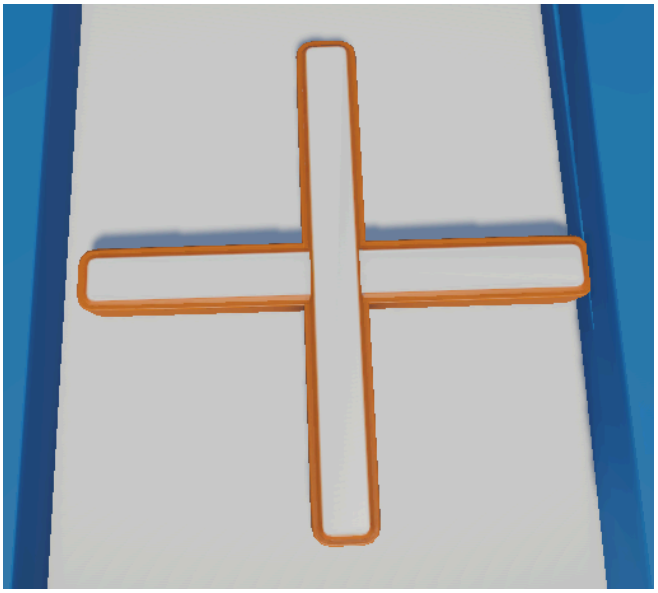
Level Mechanics

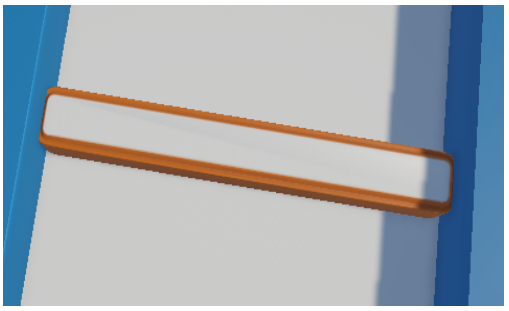
General description of what they do / how they work
When you are supposed to use them
When are not supposed to use them

No more than 2 different mechanic groups in a row.

Moving Platforms - Universal

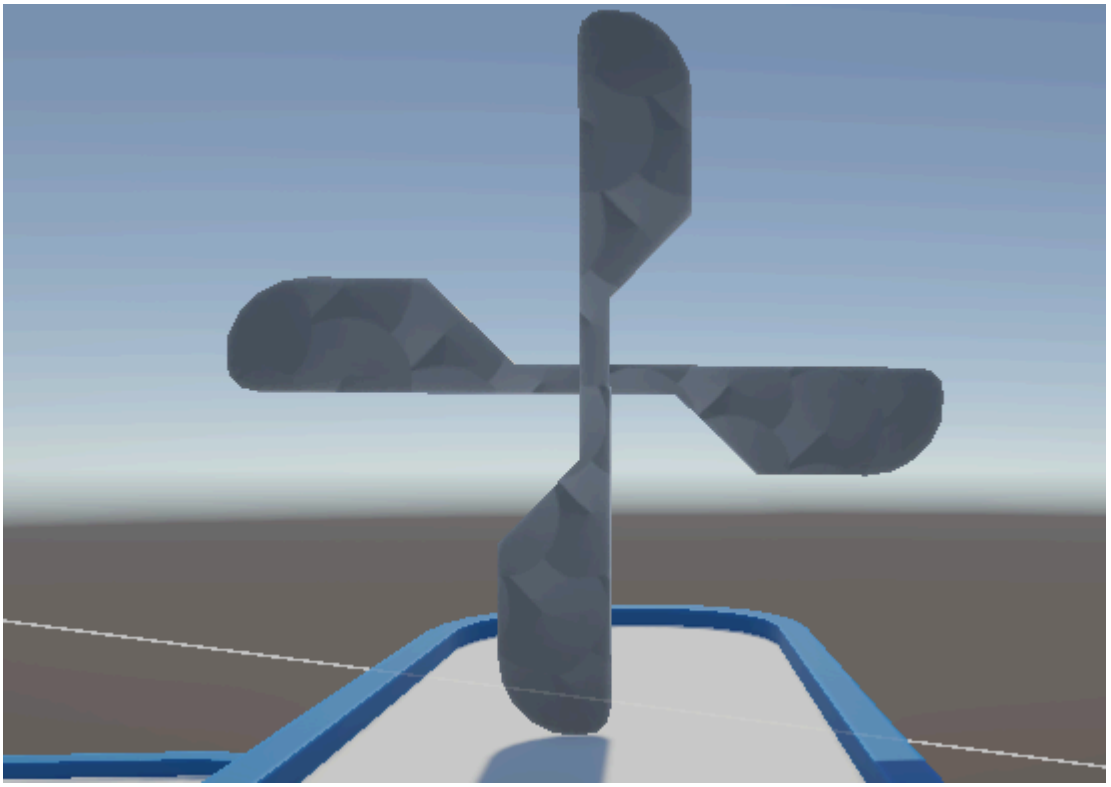
A platform that moves. Could go up and down, or left to right or even front to back.
It makes the player time their shot or else the shot will be blocked. These shouldn't be used with more than 2 after eachother, if you use more than this it will be too cluttered and too hard. These appear at first in the tutorial and should be used on parts that are very easy and empty. This way you make the level a bit more interesting and a bit harder.





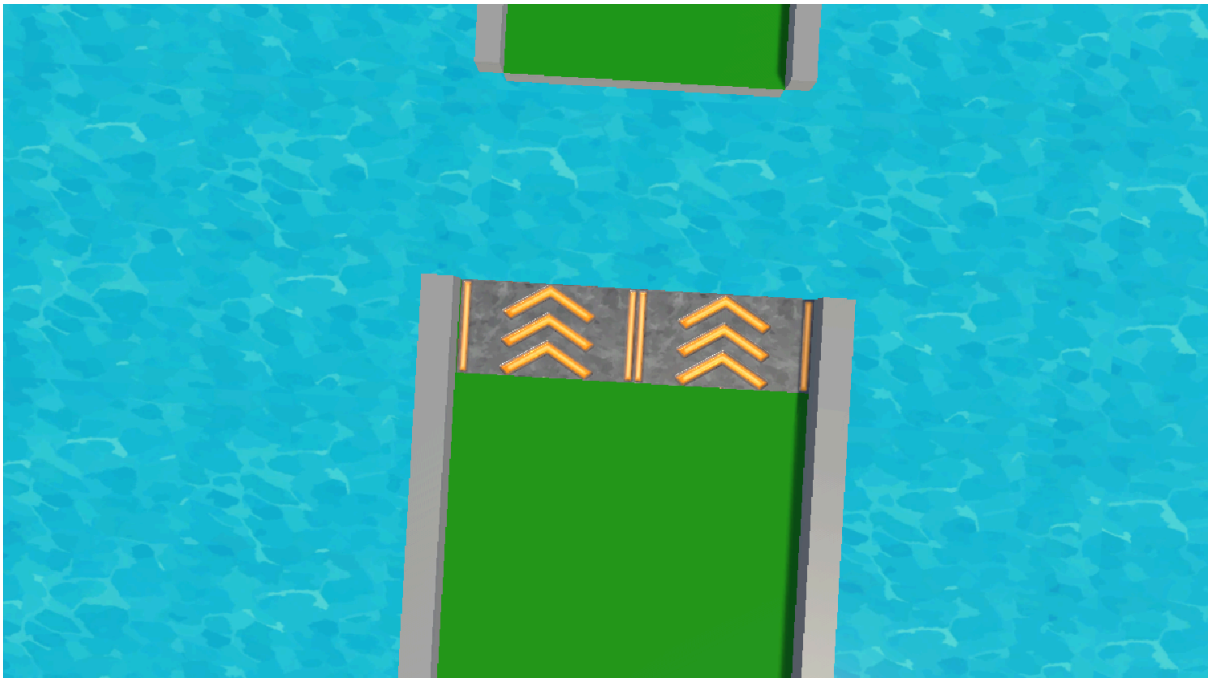
Windmills - Universal

It's a windmill. It will block the player's passage and force them to time their shots. Use them only on straight lanes. Do not include next to obstacles designed to further slow the player down so as to avoid tedium. First appear in the tutorial, will show up and be used in both other courses. The windmill should not prevent the player from moving forward for more than a maximum of 2 seconds.



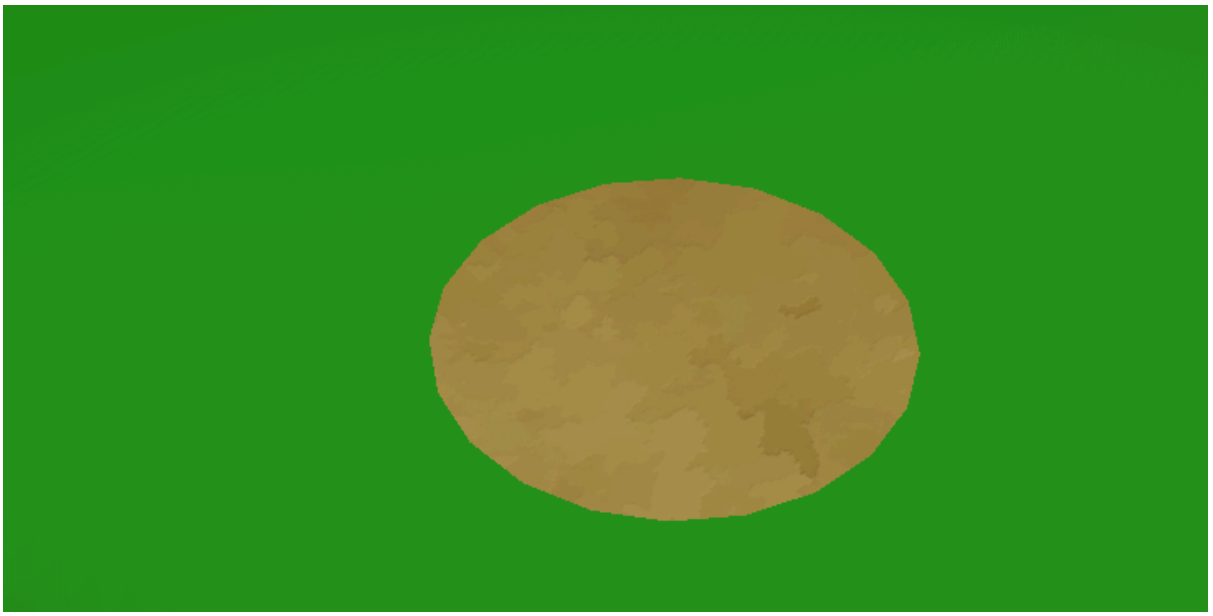
Booster Pad - Course 1

Boosts the player's speed, should be included next to jumps or places where the track dips or shoots upwards to help the ball get to the next part. Can also be used as an obstacle to set the player back by shooting them back along the course. Introduced in the first course and used throughout. Increases the players speed by a fixed amount each time. This amount can be changed per pad but running over multiple pads of the same boost speed will not increase the speed.



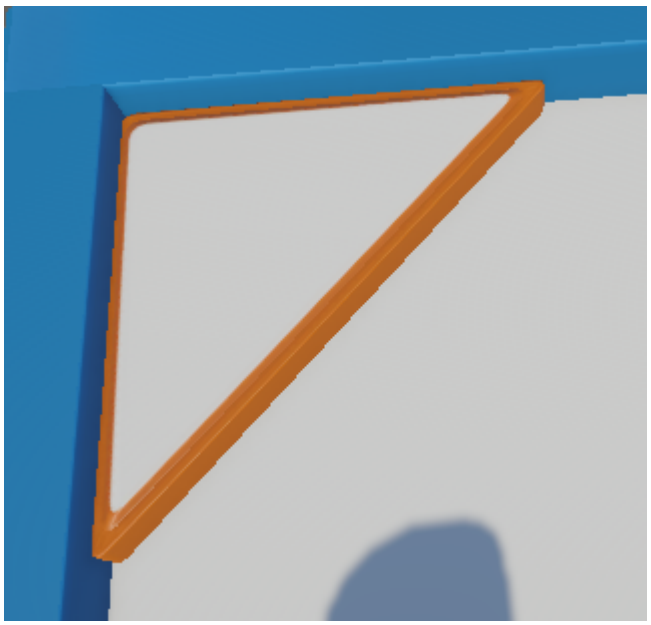
Sand Traps - Course 1

Slows the players movement speed while they are inside them. Do not include next to other obstacles that slow the player down or require the player to time their shots. Can be used on straight or curved lanes. Can be used pretty much anywhere mainly to be used as a small inconvenience to the player to encourage them to try and go around them.



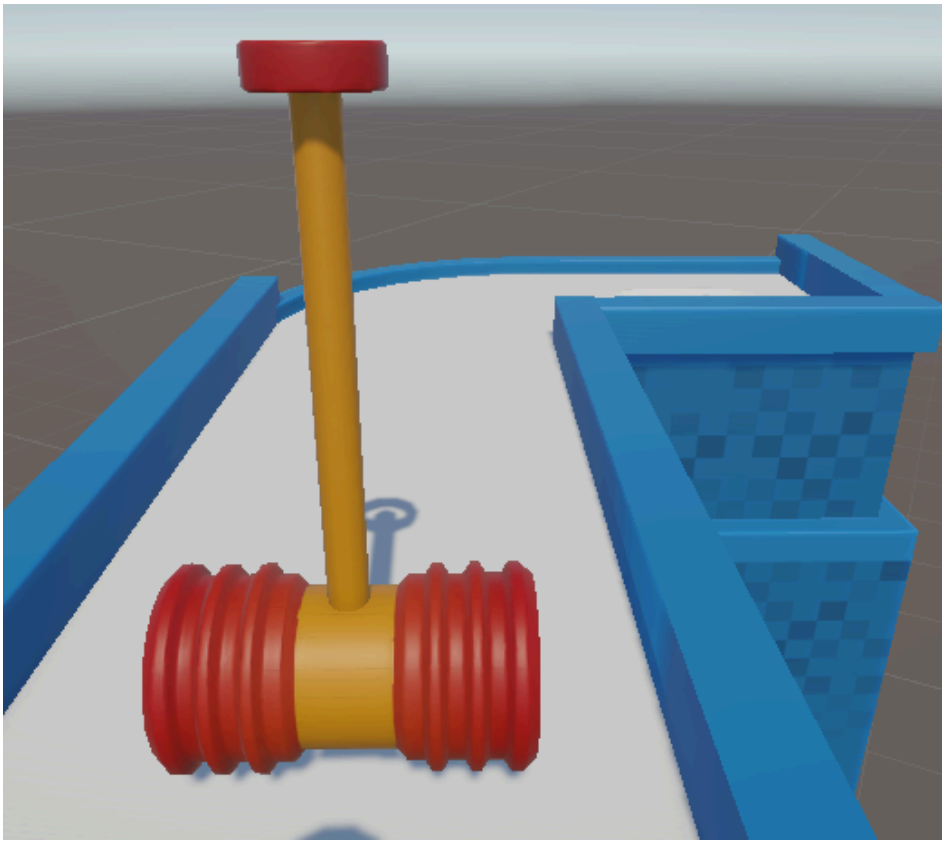
Bouncy Walls - Course 2

The bouncing walls are the triangle pieces in the corners of the lanes. These walls are angled so the ball bounces off of them. These should only be used in corners. They should not be placed near obstacles like a windmill for example because it is near impossible to shoot through the windmill by using the bouncy wall.



Swinging Hammers - Course 2

The swinging hammers are hammers that hang in the sky and move from left to right. With this the hammers will slam the golf ball to the sides when they hit it. These should be placed on long straight lanes. You can use multiple after each other but I don't recommend using more than 3 after each other and with a reasonable space in between. They should not be placed just around a corner since it can shoot you back. They should also not be placed after a ramp in case it will slam the ball off track. And lastly the hammer shouldn’t be placed close to obstacles like the windmill because you can't time this properly nor can you shoot precise enough to get through both obstacles at the same time.



Lanes

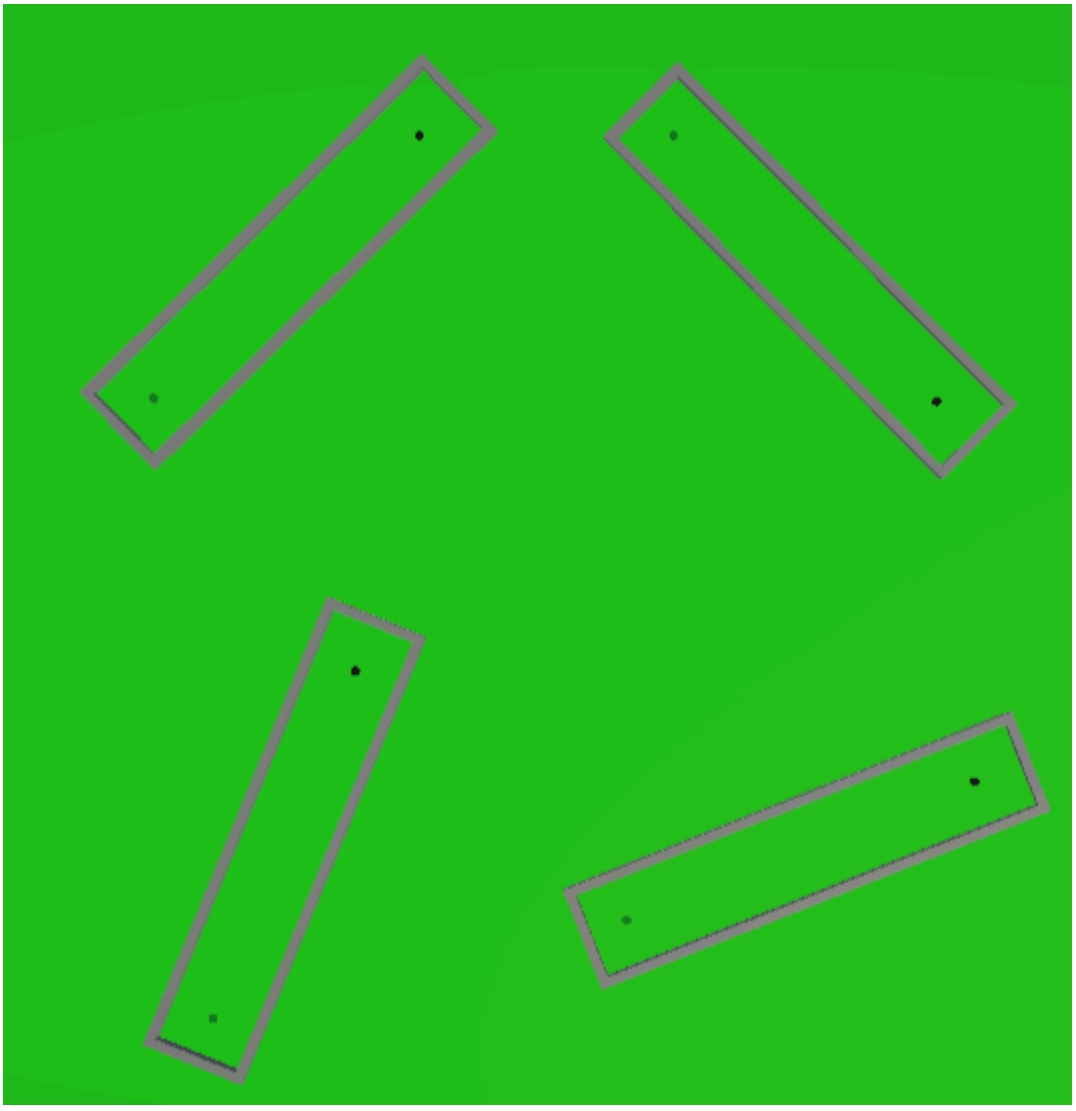
The lanes are the building blocks that connect the starting point of a level to the hole. This page will describe all of the different ones. Each lane section should be roughly thirty Unity length units in length.

Straights - Universal

These are straight line course sections. They can go in any direction.

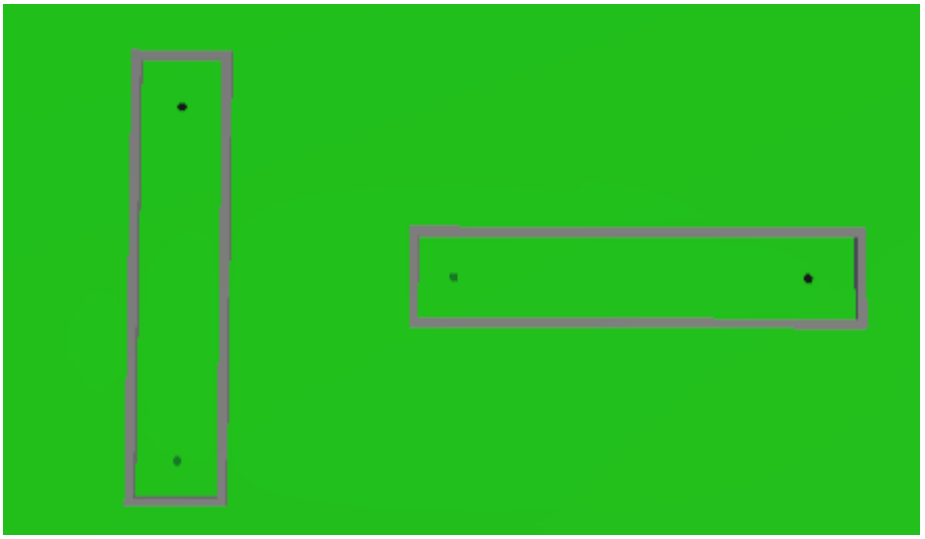
Diagonals

The easiest lanes to traverse. 45-degree angles in any diagonal can be travelled through with the M set as 1. Steeper angles are traversable with higher M values. Less steep angles need M values between 0 and 1. These are harder to get in the game so use these angles sparingly.



Cardinal directions

Surprisingly tricky to get through. Straights up and down are impossible to go through completely straight. The closest possibility is a really big number for M which can only be created through addition of cards. Straights left and right can only be traversed with a 0 in the M slot, which doesn't occur naturally and can only be created with subtraction and a lot of luck. Try to avoid using these as much as possible.



Curves - Universal

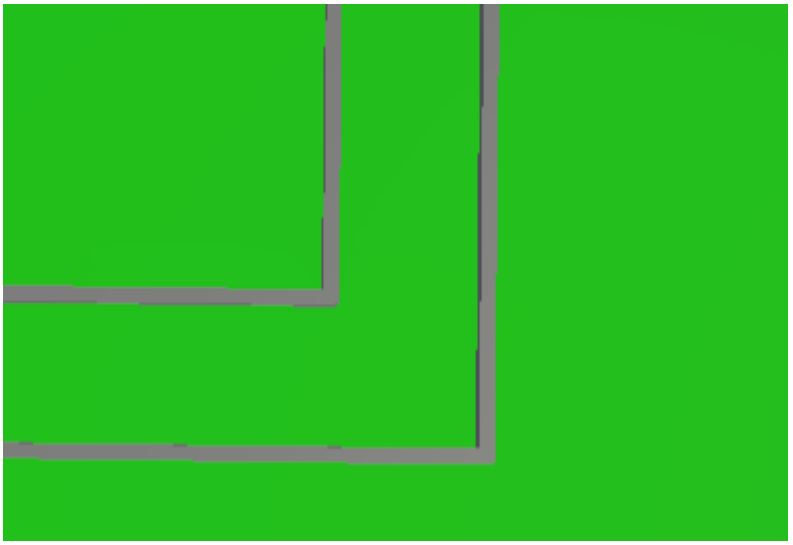
These are course sections that curve. They come in a variety of angles.

45 degrees

Curves of 45 degrees. These take two shots to go through.

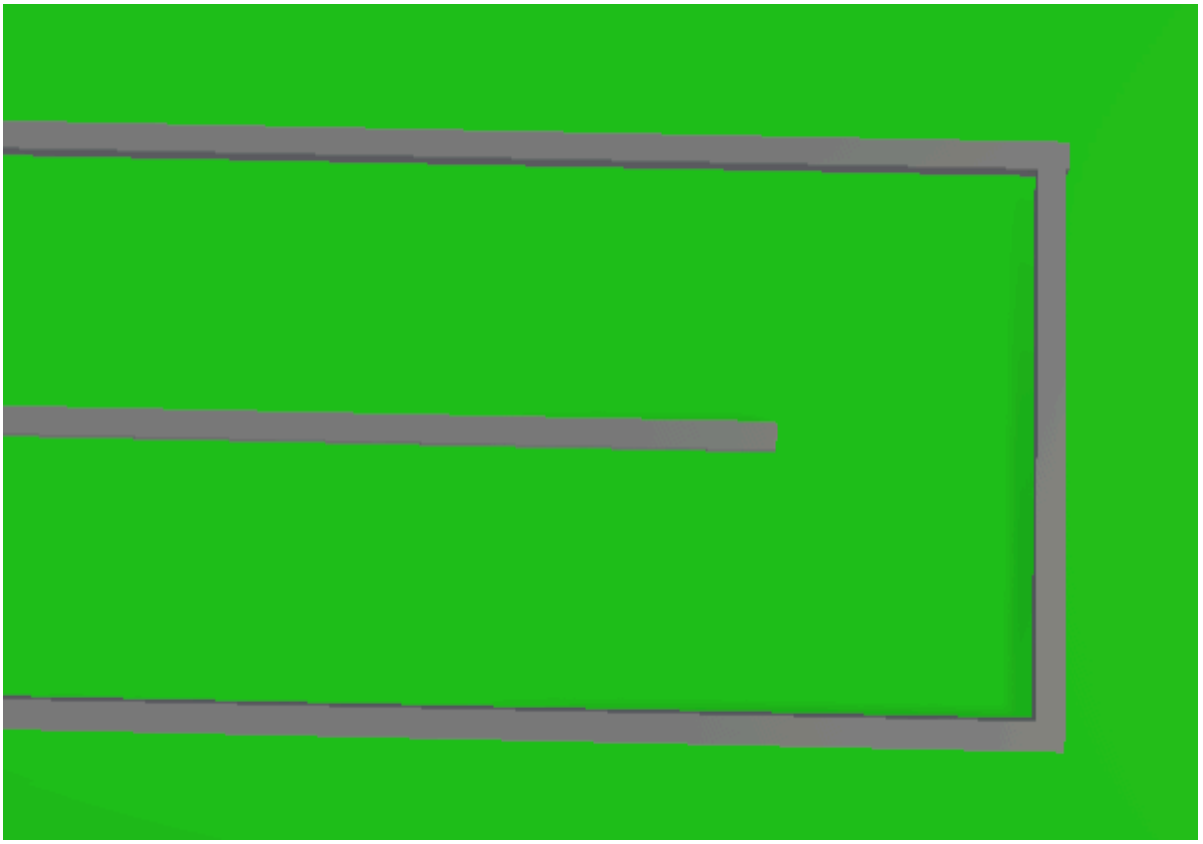
90 degrees

Curves of 90 degrees. These take two or three shots to go through.



180 degrees

Curves of 180 degrees. Can also be called a hairpin or a U-turn. These take three shots to go through.

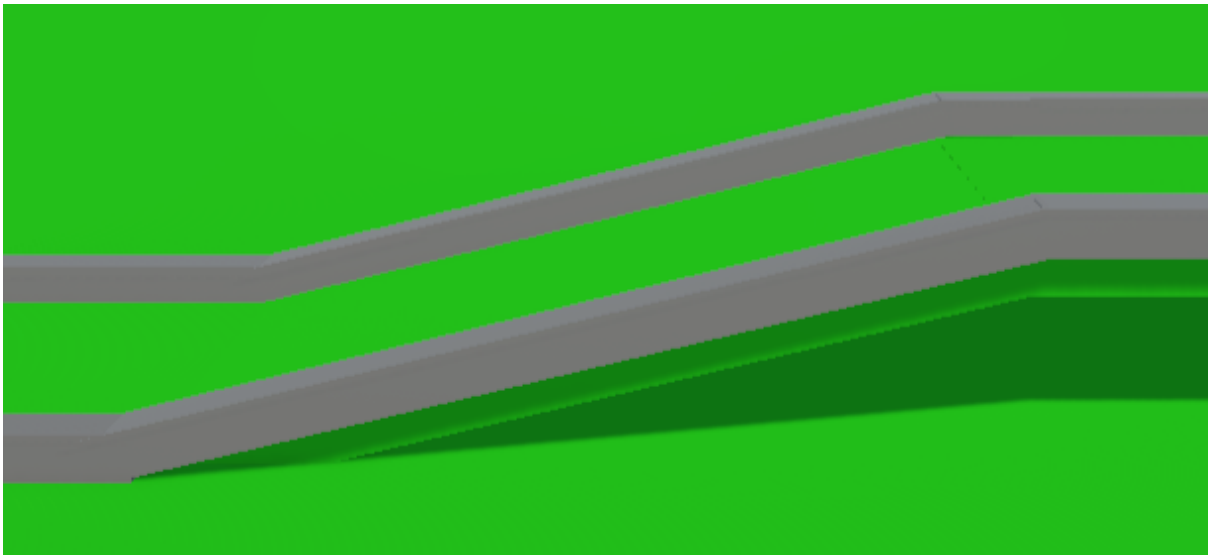


Ramps - Universal

These are course sections with height changes. They can go either up or down.

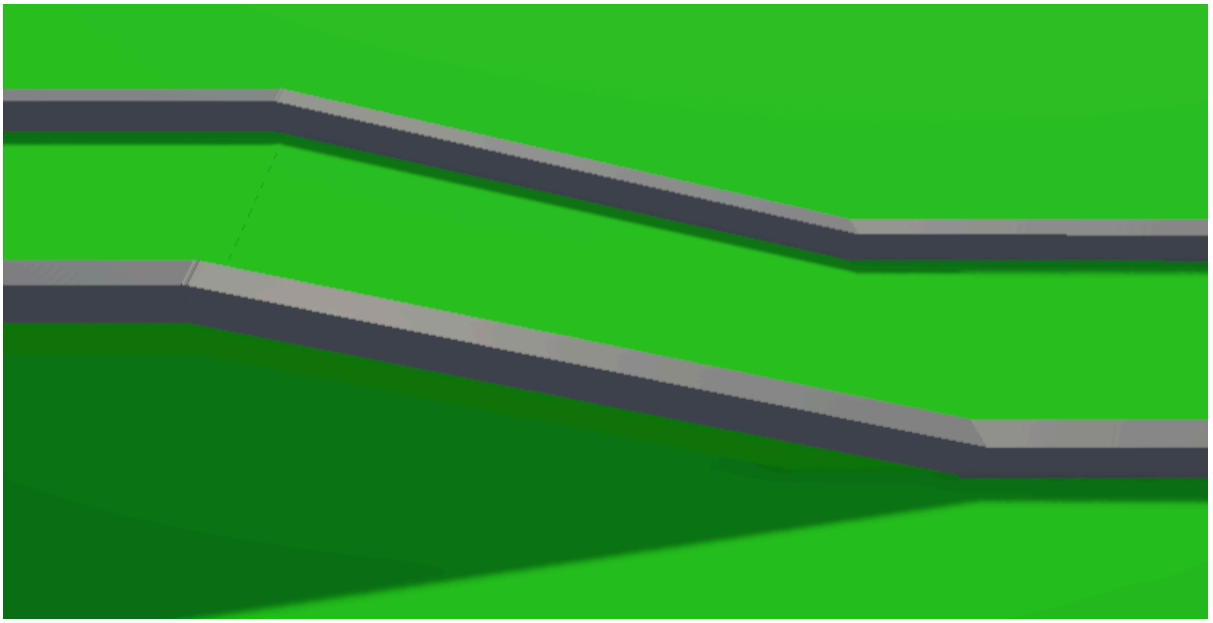
Up

Requires a lot of force and therefore a high value for the X to get up due to gravity pulling the ball back down to the bottom of the ramp. These ramps should be no steeper than 30 degrees.



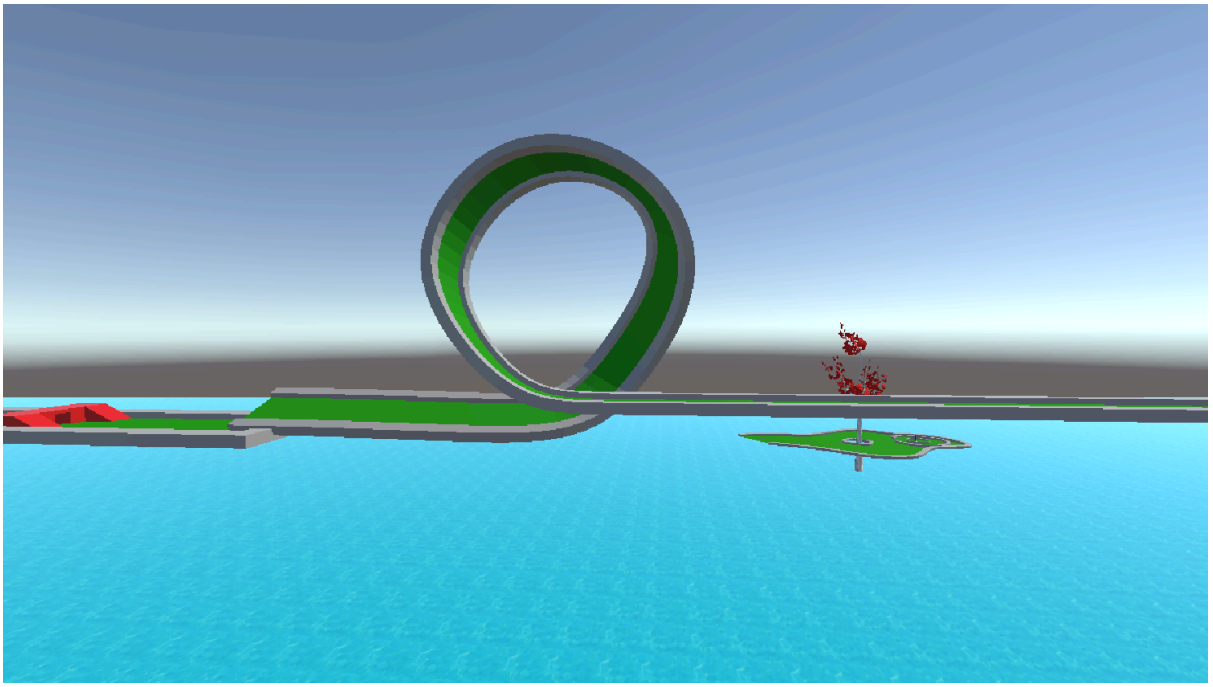
Down

Doesn’t require as much force because gravity will pull the ball to the bottom of the ramp automatically.



Loop-de-loop - Course 1

The track loops upwards and around on itself, the player has to approach it with speed or else they will not be able to clear the loop. This means the player has to have a good run up to it. Do not place it at the beginning of a course or next to sand traps. The loop can be any size but if you make it too high the player may need a speed boost to get through it.



Tunnels - Course 2

The track goes into a wide tunnel that the player must shoot through with a bit of precision. If the player hits the sides it will slow them down. The player will need to line up their shot to go into the tunnel. It should not be placed near boosters or fast shots since this shot requires a bit more precision.

Art Style

- Simple vibrant cartoon style with soft basic models

- It doesn't distract from the core idea
- Vibrant colours keep players attention to the game
- Easier to achieve than pseudo-realism

Colors and the effect it gives to the level

Blue = ice
Green = nature or grass
Yellow = desert
Orange = autumn
Purple/black = nighttime
Red = Something powerful

Useful Sources:

Level Design:

[1] D. Taylor, "Ten Principles of Good Level Design (Part 1)," *Game Developer*, Sep. 29, 2013. [Online]. Available: https://www.gamedeveloper.com/design/ten-principles-of-good-level-design-part-1-

[2] D. Taylor, "Ten Principles of Good Level Design (Part 2)," *Game Developer*, Oct. 6, 2013. [Online]. Available: https://www.gamedeveloper.com/design/ten-principles-of-good-level-design-part-2-

[3] A. Brazie, "Game Design Blog by Practicing Game Designers and Developers," *Game Design Skills*, [Online]. Available: https://gamedesignskills.com/blog/. [Accessed: Jun. 5, 2025].

[4] bytecauldron, "awesome-level-design," GitHub, [Online]. Available: https://github.com/bytecauldron/awesome-level-design. [Accessed: Jun. 5, 2025].

Art Direction

[5] Pixune Studios, "All about Art Direction in Game Development," *Pixune*, [Online]. Available: https://pixune.com/blog/art-direction-in-game-development/. [Accessed: Jun. 5, 2025].

[6] D. Scott, "A Comprehensive Guide to Color Theory for Artists," *Draw Paint Academy*, Jan. 2, 2017. [Online]. Available: https://drawpaintacademy.com/a-comprehensive-guide-to-color-theory-for-artists/. [Accessed: Jun. 5, 2025].

Golf course Design

[7] Harris Miniature Golf Courses Inc., "Key Elements of a Good Mini Golf Course Design," *Harris Miniature Golf*, [Online]. Available: https://www.harrisminigolf.com/key-elements-of-a-good-mini-golf-course-design/. [Accessed: Jun. 5, 2025].

[8] Miniature Golf Plans, "Design Your Adventure Golf Course," *MiniatureGolfPlans.com*, [Online]. Available: https://miniaturegolfplans.com/design. [Accessed: Jun. 5, 2025].