



# **Wii Sports for Dummies**

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# Lighting, Textures, and Movement

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Typical lighting and camera set-up

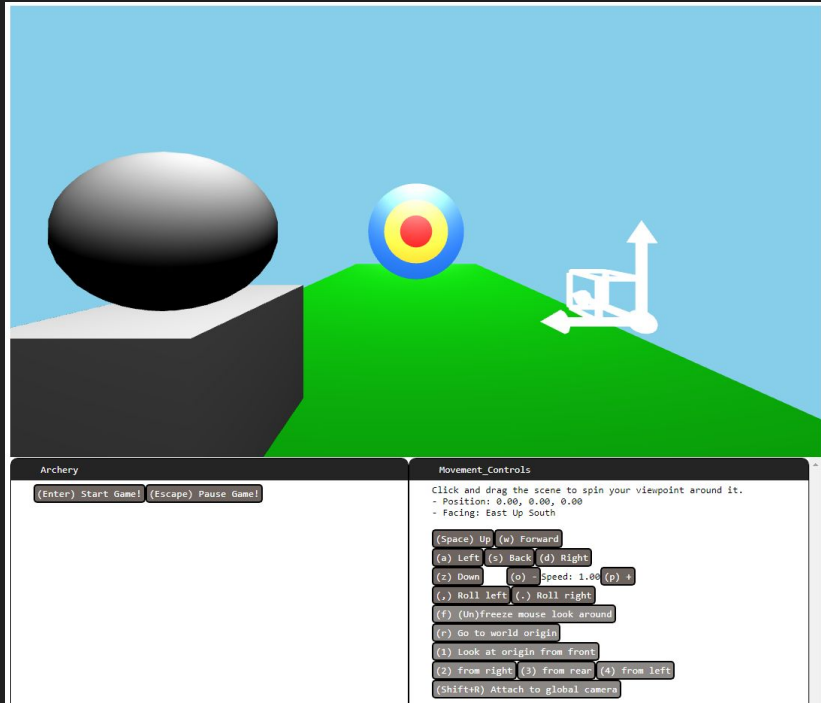
Generally phong-shaded

Trees and grassy plains are textured

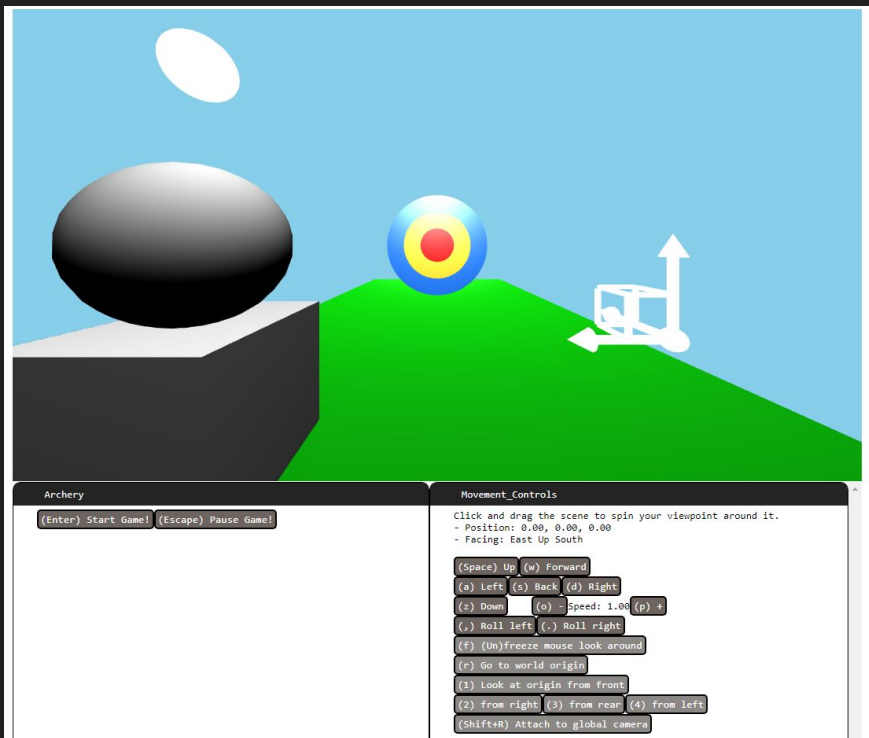
- Maximum immersion

Target and arrow are animated through the use of member variables, time variables, and appropriate physical equations adjusting with each display loop

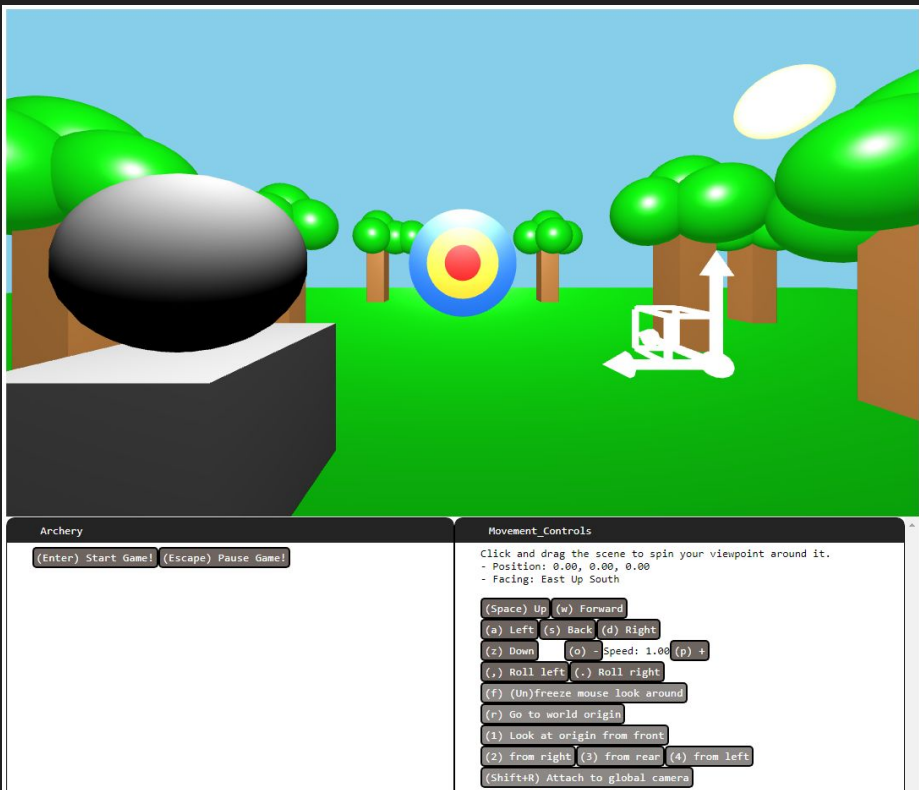
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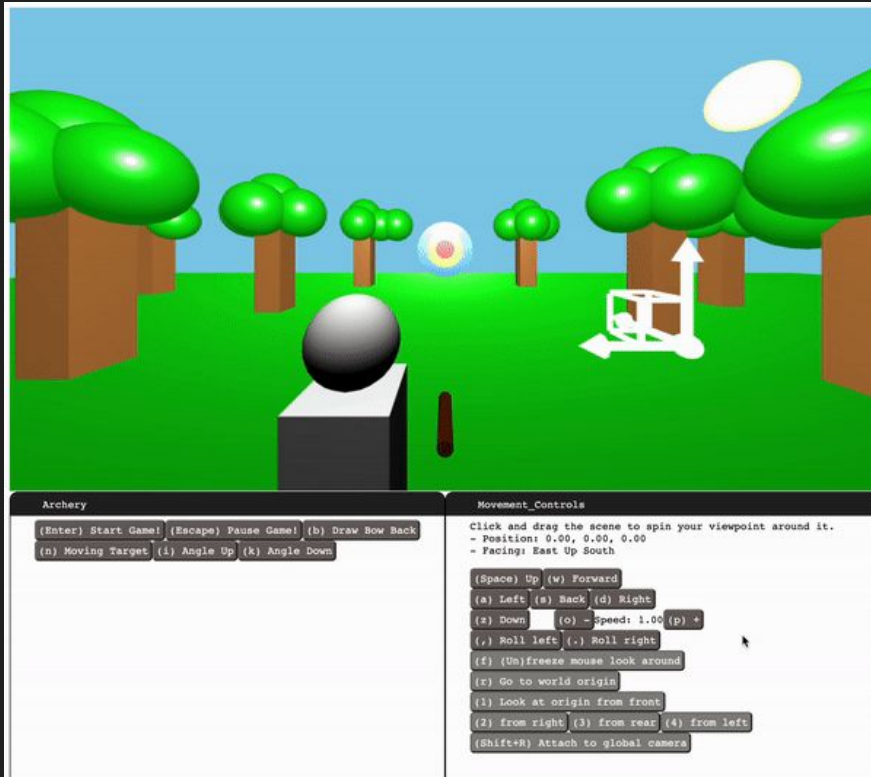
- We initialized the position of the camera and the lighting in our initial stages so that the entire environment would be illuminated.
- We struggled a bit with the initial placement of the “green plane” that would later act as our grass and floor.
- To implement the “blue sky,” we simply drew a blue box that encompassed the entirety of the environment.
- The axis is to help us determine which direction was which.



- We then implemented a sun and would later use that as a source of light to illuminate down on the screen
- However, I felt that since there was already a player model on the left side that the left side of the screen and game felt clutter and therefore unappealing.
- End result had a moved sun to the top right



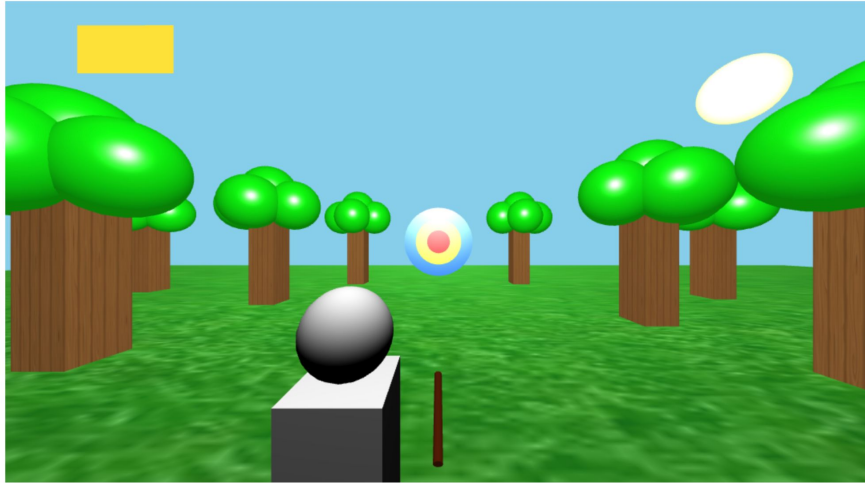
- After finalizing the sun position, plus adding a yellow ring around the sun to make it look less like a white blob in the sky, the environment was drawn.
- The trees were very easy to reproduce as they were copied and pasted in different positions, this applied to the leaves as well
- The target was also drawn into the environment.



- Now the goal was to add more interactivity into our game.
- The game was quite simple with a static target, static player, and moving arrow.
- So, we decided to implement a moving target.

## Wii Resorts for Dummies: Archery

Score:



### Archery

(Enter) Start Game (b) Release/Reset Arrow (v) Draw Back  
(n) Moving Target (g) Angle Up (h) Angle Down

### Movement Controls

Click and drag the scene to spin your viewpoint around it.  
- Position: -0.01, 0.00, -0.00  
- Facing: West Up South

(Space) Up (w) Forward  
(a) Left (s) Back (d) Right  
(z) Down (o) Speed: 1.00 (p) +  
(,) Roll left (.) Roll right  
(f) (Un)freeze mouse look around

- In it's near finalized product, textures were added to the trees and grass to give it a more realistic look then just a flat color.
- The charge bar was added in the upper left for the player to visualize the amount of charge into their bow.

# Physics Simulation: Shooting an Arrow

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## Flight Path

- Initial velocity and angle theta determined by player input
- Calculated through standard sin and cos functions

$$y = y + \text{velocity} * \sin(\text{theta}) * \text{time} + 0.5 * \text{gravity} * \text{time}^2$$

$$z = z + \text{velocity} * \cos(\text{theta}) * \text{time}$$

## Trajectory

- Tangent of the arrow's displacements in the y and z axes
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# Collision Detection

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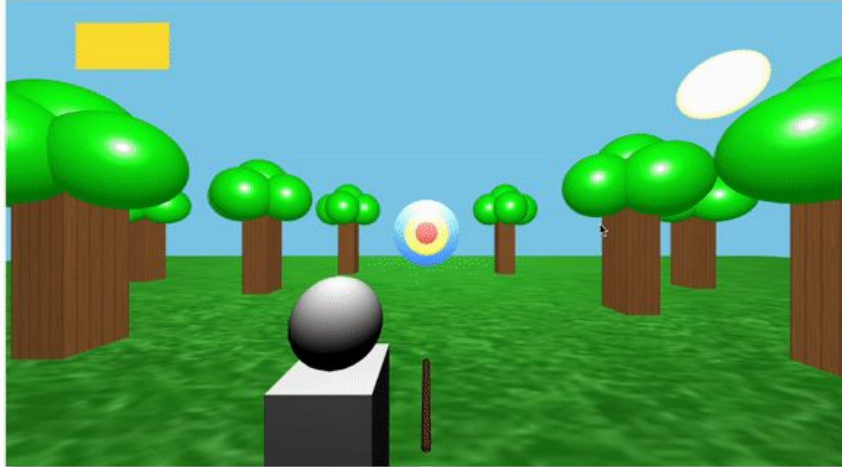
Compares arrow and target locations through the use of member variables

If they are within an appropriate distance, collision is recorded. If the arrow reaches the ground's y coordinate, it is considered a miss

- Arrow “sticks” to target
  - Increments score
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## Wii Resorts for Dummies: Archery

Score:



### Archery

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### Movement Controls

Click and drag the scene to spin your viewpoint around.  
- Position: -0.01, 0.00, -0.00  
- Facing: West Up South

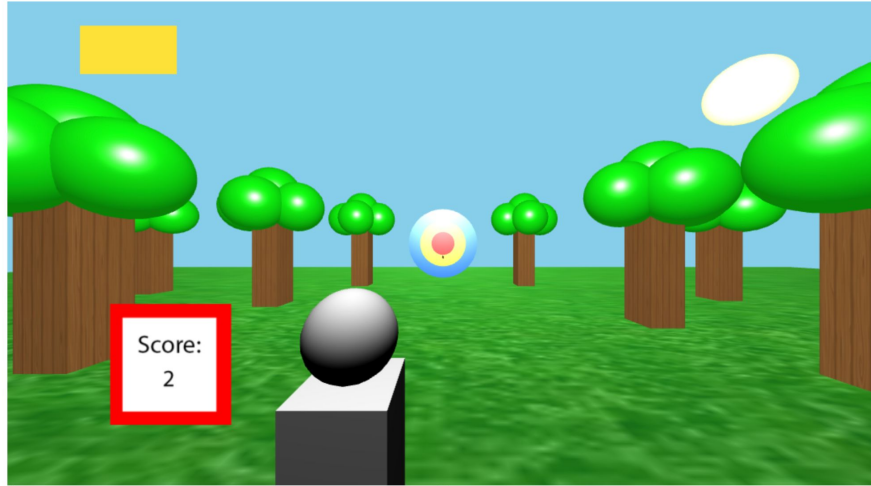
(Space) Up (w) Forward  
(a) Left (s) Back (d) Right  
(z) Down (o) - Speed: 1.00 (p) +  
(.) Roll left (,) Roll right  
(f) (Un)freeze mouse look around

- With the implementation of the flying arrow and the collision detection, the arrow was able to land on the target.

# Scoring

- When an arrow hits the target, the score increments
- Appropriate texture is displayed on a basic square object
- Due to issues with collision, scoring is not dependent on where the arrow hits the target as we had projected

## Wii Resorts for Dummies: Archery



Archery	Movement Controls
(Enter) Start Game! (b) Release/Reset Arrow (v) Draw Back (n) Moving Target (g) Angle Up (h) Angle Down	Click and drag the scene to spin your viewpoint around it. - Position: 0.00, 0.00, 0.00 - Facing: East Up South  (Space) Up (w) Forward (a) Left (s) Back (d) Right (z) Down (c) Speed: 1.00 (p) + (,) Roll left (. ) Roll right (f) (Un)freeze mouse look around (r) Go to world origin (l) Look at origin from front (q) from left (t) from top (y) from left

- The final implementation was the working score system

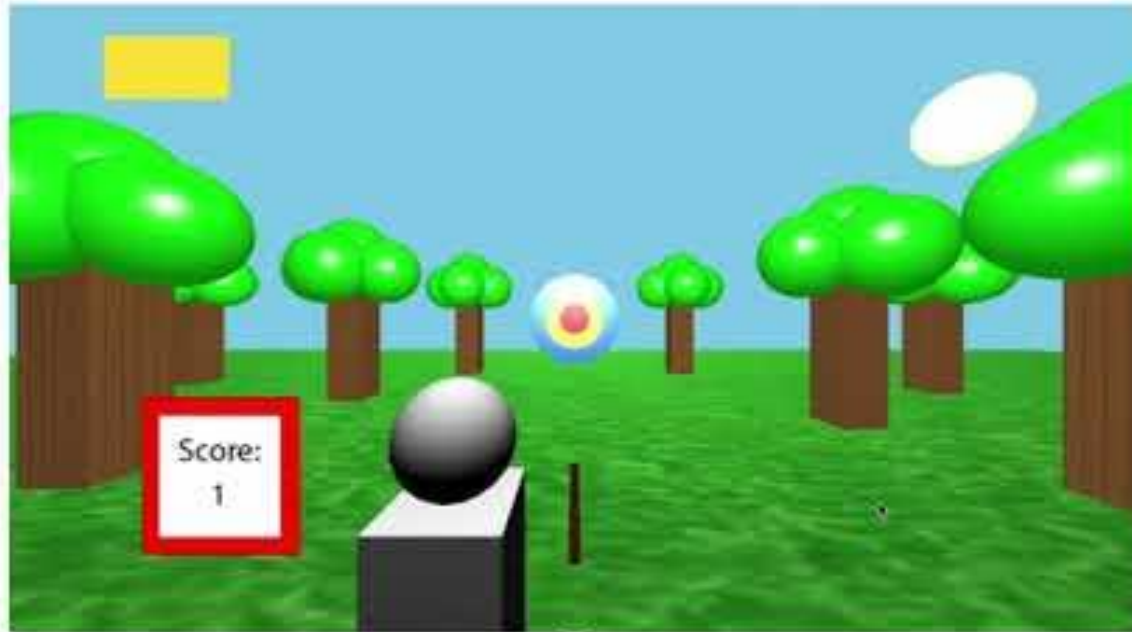


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GIF DEMO

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## Wii Resorts for Dummies: Archery



### Archery

(Enter) Start (b) Release/Reset Arrow [Go Back](#)  
(x) Missing Target (q) Angle Up (v) Angle Down

### Movement Controls

Click and drag the arrow to spin your viewpoint around it.  
- Position: 0.00, 0.00, 0.00  
- Facing: East Up North

Control: (w) Forward  
(a) Left (s) Back (d) Right  
(k) Jump (l) Speed: 1.00 (m) [...](#)  
(i) Roll Left (j) Roll Right  
(z) Tilt Forward (x) Tilt Back  
(c) Tilt Left (v) Tilt Right  
(f) Tilt Up (t) Tilt Down