Physics Demo User Manual

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Contents

[General Controls 3](#_Toc507854576)

[Pool Game 4](#_Toc507854577)

[Controls 4](#_Toc507854578)

[Rules of the game 4](#_Toc507854579)

[Slug 6](#_Toc507854580)

[Controls 6](#_Toc507854581)

[Bouncing Balls 7](#_Toc507854582)

[Controls 7](#_Toc507854583)

[Rope Bridge 8](#_Toc507854584)

[Controls 8](#_Toc507854585)

# General Controls

Pressing a number key switches to the indicated demo

Use the direction keys to move the camera. Click the middle mouse button to recenter the camera.

Press R to restart the current demo.

Press Escape to return to the main menu.

# Pool Game

This is a game of pool for two players. Sink all the balls of your colour, and then the black eight-ball, to win the game.

## Controls

Click and drag the mouse to pull back your cue. Release the mouse to shoot, or press spacebar to cancel

When placing the cue ball after scratching it, click where you want to place it.

Press R to rerack the balls. If a game is ongoing, the current player is treated as forfeiting and loses the game.

On game over, press spacebar or r to play again.

## Rules of the game

**The Break**

The game starts with the balls racked in a triangle, with the eight-ball in the middle of the third row. Shoot the cue ball into them to break.

If the player doesn’t hit any of the balls, it’s a foul and the other player gets to start again with a penalty shot.

If the eight-ball sinks off the break, the game restarts, with the other player breaking.

If the cue ball is scratched off the break, there’s no penalty, but any other balls sunk are ignored and play passes to the other player.

**Turns**

On a player’s turn, they get to take a shot with the cue ball. If they legally sink a ball, they can continue playing until they fail to sink a ball. If they have a penalty shot, they take another turn after that.

Any foul will end a player’s turn and pass play to the next player, even if they have a penalty or sunk a ball.

**Colour**

Apart from the cue and eight balls, balls are either red or yellow. The first time a player legally sinks a ball, they get that ball’s colour, and the other player gets the opposite colour. When all balls of a player’s colour are sunk, they are on the eight-ball and can sink it to win.

**Fouls and Penalties**

The following are fouls, giving the other player a penalty shot

* Scratching (sinking) the cue ball
* Hitting off-colour balls before any of your own colour\*
* Hitting the eight-ball before any of your own colour, unless on the eight ball\*
* Sinking off-colour balls\*

\*except on the first penalty shot

The first shot immediately after getting a penalty shot has some special rules

* You are allowed to hit off-colour balls and the eight-ball before your own
* Sinking off-colour balls is legal, and allows you to continue your turn
* When on the eight-ball, you may legally sink both off-colour balls and the eight-ball on that shot

**Ending the game**

The game ends once the black ball is sunk. If the player sinking the black ball has already sunk all balls of their own colour, and hasn’t committed a foul, they win. Otherwise, they lose.

Sinking the eight-ball and scratching the cue ball is a loss.

Sinking the eight-ball and off-colour balls on the same shot is a loss, *unless* it is a penalty shot *and* no on-colour balls were on the table at the start of play

Sinking the eight-ball and on-colour balls in the same shot is legal, as long as the eight-ball is the last one sunk. Otherwise, it’s a loss.

The winning player gets one point, and gets to break in the next game.

# Slug

In this game you play as a slug. Squeeze through the obstacles and climb up to find food.

## Controls

WASD: Move the slug’s head

Hold left shift to relax the slug’s body. Release it to tense up again

Press right control or the middle mouse button to center camera on the slug

Press R to restart game

# Bouncing Balls

This shows a bunch of objects bouncing around the screen, including a soft body and a pendulum on a spring.

## Controls

Click, drag, and release the mouse to apply an impulse to objects

Press G to toggle gravity

# Rope Bridge

This demo simulates a rope connected between two points

## Controls

Click and drag an object to pull it around

Press W and S to increase and decrease the tightness of the rope.