

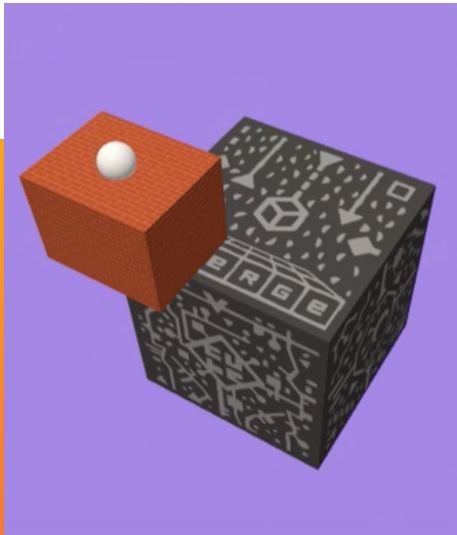
# 3D Shape Game Design

Grades

4-10

Created by Mike Page & Nate Lott

\*Requires accounts with CoSpaces Edu Pro



Difficulty **3**



2-60 minutes



1 to 1

Tags: Math, Art, CoSpaces Edu

## App/Tech Tools

CoSpaces Edu Pro accounts, MERGE Cube, MERGE Headset (optional), device (phone/tablet)

## Materials









### Learning Objectives

- Knowledge and understanding of 3D shapes.
- Manipulation of 3D shapes.
- Basic game design and structure.

**Suggested Vocabulary:** Cuboid, Cylinder, Tetrahedron, Cone, Pyramid, Ellipsoid (Sphere), Cube, Triangular Prism

## Activity

1. Search the shapes above to see what they look like in 3D. You can talk about the attributes of these shapes.

Properties of 3D shapes			
<p>Cone</p>  <p>2 Faces 1 Edge 1 Vertex</p>	<p>Sphere</p>  <p>1 Face 1 Edge 0 Vertices</p>	<p>Tetrahedron</p>  <p>4 Faces 6 Edges 4 Vertices</p>	<p>Cuboid</p>  <p>6 Faces 12 Edges 8 Vertices</p>
<p>Cylinder</p>  <p>3 Faces 2 Edges 0 Vertices</p>	<p>Cube</p>  <p>6 Faces 12 Edges 8 Vertices</p>	<p>Triangular Prism</p>  <p>5 Faces 9 Edges 6 Vertices</p>	<p>Square-based pyramid</p>  <p>5 Faces 8 Edges 5 Vertices</p>

- Take out the Merge cubes and the tablet/phone and have students go to [this url](#) in their web browsers. That link will show them a game created using various geometric shapes that have been coded to move a ball through a course.

You can check out how the game is played here



- Ask the students to try and complete the course. Once they have played the game a number of times ask them to tell you the different shapes they saw in the game. Did it look like the shapes had been flattened or manipulated in a specific way to use them as a platform or launcher in the game? Depending on the level of the class you could talk about the  $x,y,z$  axis and how something that perhaps started as a cube could be pulled and stretched on these axis.
- After you have done some research with them they will be creating their own game using various geometric shapes.

The starter video for building their game is here



This video is an introduction and allow for limitless design options for the students.

- The construction of this game will require quite a bit of design practice with the Merge cube as the have to constantly test their game to check it playability.

## Suggested Questions

- Can you combine 2 shapes together to form something new?
- On the Merge Cube can your partner name all of your shapes?
- Can shapes be stretched to form a ramp or platform?

- How could you form your shapes together to create a recognizable object (house, car)?
- Can you use the shapes to create your name?
- How can you create a shape with 10 sides?
- Can you use your shapes to build a sun and clouds?
- Can you create the Mege cube pattern in your game somewhere?

## Extension Idea

- MERGE Cube 6 sided option, they can perhaps add new levels on the sides of the Cubes.

