Lumination Learning Lab

Lesson Bytes
Teaching ideas for immersive learning

Soccermetry:

Exploring Geometry in Soccer

Learning Area(s)
Maths

Year Level
Year 8 - 9

Introduction

Students will explore the connection between geometry and soccer through engaging, hands-on experiences. By combining VR technology with practical activities, students will understand the geometric principles behind soccer balls and enhance their spatial awareness and coordination. The lesson will include both virtual experiences and creative tasks, allowing students to see and feel the concepts in action, making the learning process dynamic and interactive.

Application

Final Soccer
Final Soccer uses VR headsets and trackers to engage in immersive gameplay. This is a soccer simulation app designed to enhance fitness, coordination, balance, and motivation through physical activity in a virtual environment. The app allows students to tailor their experience to their preferences and abilities.

Lesson Overview

Lesson Objectives

- Understand the geometric shapes involved in soccer ball design.
- Enhance spatial awareness and physical coordination through VR gameplay.

Resources

Video

- Geometry of Footballs and the ... (9:54)

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- Apply geometric principles to real-world sports scenarios.

3D Nets Templates

- Perimeter Football Net
- Cube Football Shape Net

Lesson Outline

Before the Immersive Learning Journey

- Teachers and students should familiarise themselves with the IMVR experience using the Final Soccer Essentials Guide.
- Teachers should preview the videos and ensure they meet the needs of students and learning context.
- Students should review basic geometric shapes and properties.
- Prepare any necessary equipment for the VR session (headsets, controllers, etc.).
- Watch the Geometry of Footballs and the Cube-shaped Ball (9:54) video to connect theoretical geometry knowledge with practical examples.
- Teachers should print and prepare 3D nets (links under 'resources' above) for students to create. Templates may be on cardstock or paper. Provide sticky tapes to assemble.
- Bring different soccer balls for students to observe and analyse.
- Students should have access to the internet, laptops, and either a digital or paper notebook for research and notes.

During the Immersive Learning Journey

- **IMVR Station:**
  - Divide the class into small groups with 2 to 3 students per VR headset station.
  - Students rotate through roles within the group:
    - **Role 1: Student in VR** - Choose 'Shooter' mode to observe if changing the angles and placement of their soccer balls make a difference in whether they were able to make a goal or not.
    - **Role 2: Partner/s** - Help to keep time (each student

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may have approximately 5 minutes per turn) and take notes of Student in VR attempts in scoring goals based on angles/placements. Assist in making sure Student in VR stays safe within the VR boundaries and help them in and out of the gear (VR headset, controllers, and trackers).
    - Encourage students to observe the dimensions of the pitch, goal area, and angles of kicks during the experience.

- **Research Station:**
    - Students research the history and design evolution of soccer balls.
    - They will gather information on how geometry influences ball performance.
    - Add their research notes in a digital or physical notebook.

- **Creation Station**:
    - Students can put together their own geometric soccer balls using the provided 3D nets: Perimeter Football Net and/or Cube Football Shape Net.
    - **Extension idea**: Students design their own soccer ball using geometric shapes and present their designs to the class and/or create their own 3D nets using a real soccer ball similar to how the presenter on the video created a 3D net *(need access to scanner-printer)*.

After the Immersive Learning Journey

At the end of the lesson, teachers may lead a class discussion regarding what they've learnt about the use of geometry in soccer.

Some sample discussion questions:

- How do different geometric shapes affect the performance of a soccer ball?
- How did your experience with Final Soccer in VR enhance your understanding of the relationship between movement and geometry?
- What geometric principles did you find most challenging to apply in your soccer ball creation and/or design?

Additional Activities (Optional):

- Create a Soccer Ball Blueprint:
  - Students can design a detailed blueprint of a soccer ball, labelling the geometric shapes and discussing their significance.

- Geometry in Sports Analysis:
  - Analyse footage of soccer games to identify geometric patterns in player movements and ball trajectories.