Introduction to Sphero Robots

Welcome to the exciting world of Sphero Robots! This presentation will guide you through coding and tools for these versatile, spherical wonders.

We'll explore everything from basic concepts to advanced programming techniques. Get ready to roll into the future of robotics!

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What are Sphero Robots?

Spherical Design

Unique ball-shaped robots that can roll in any direction.

Programmable

Can be coded to perform various tasks and movements.

Educational Tool

Used to teach coding, robotics, and STEM concepts.

Versatile

Suitable for beginners and advanced programmers alike.

Sphero Robot Applications

Education

Teaching programming and robotics in schools.

Gaming

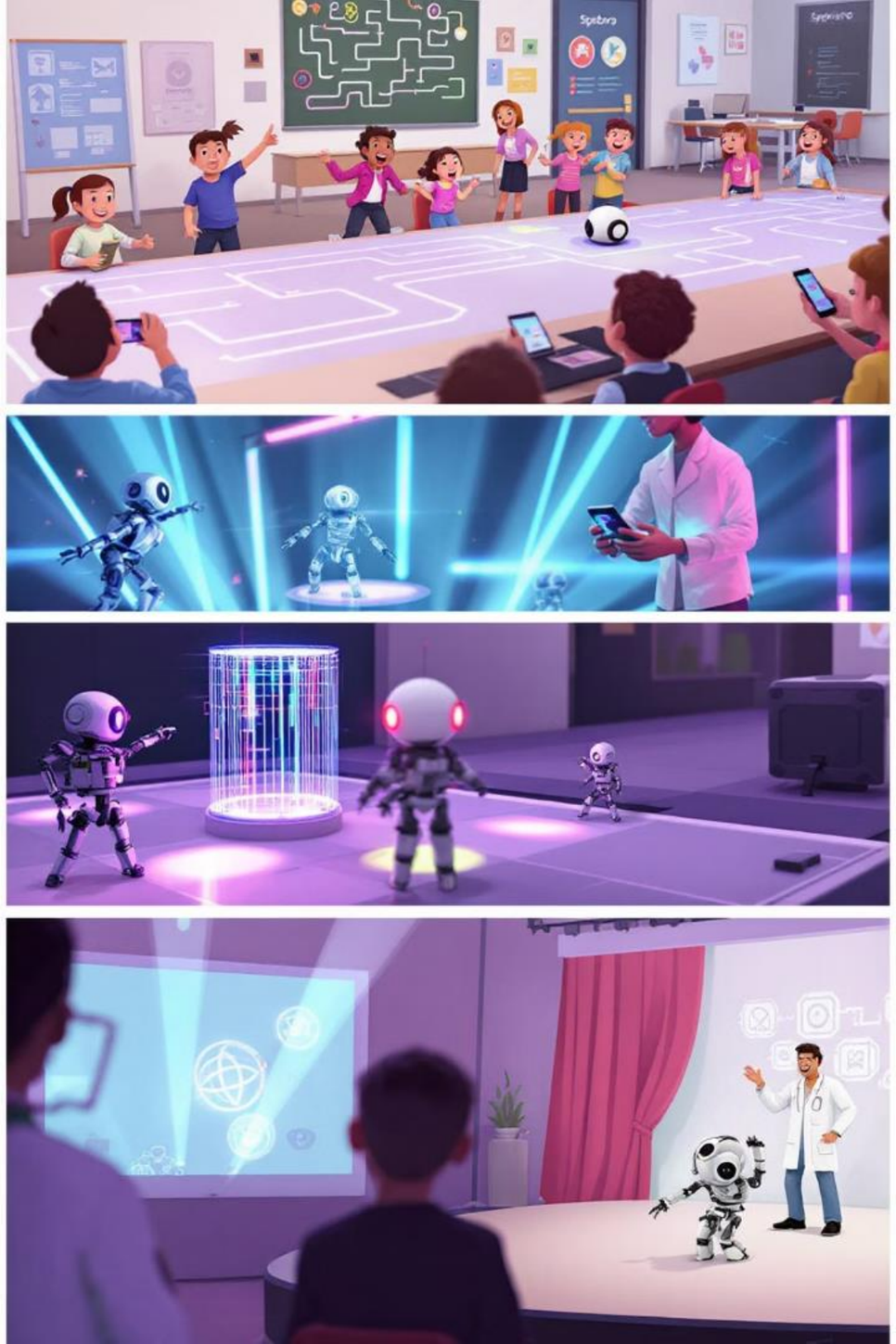
Interactive, augmented reality games and challenges.

Robotics Research

Testing algorithms and AI in spherical robots.

Entertainment

Creating interactive light shows and performances.



Sphero Robot Hardware Overview

Outer Shell

Durable polycarbonate sphere, waterproof and shockproof.

Internal Components

Motors, gyroscope, accelerometer, LED lights, and Bluetooth module.

Power Source

Rechargeable battery with inductive charging capability.

Sphero Robot Software

Sphero Edu App

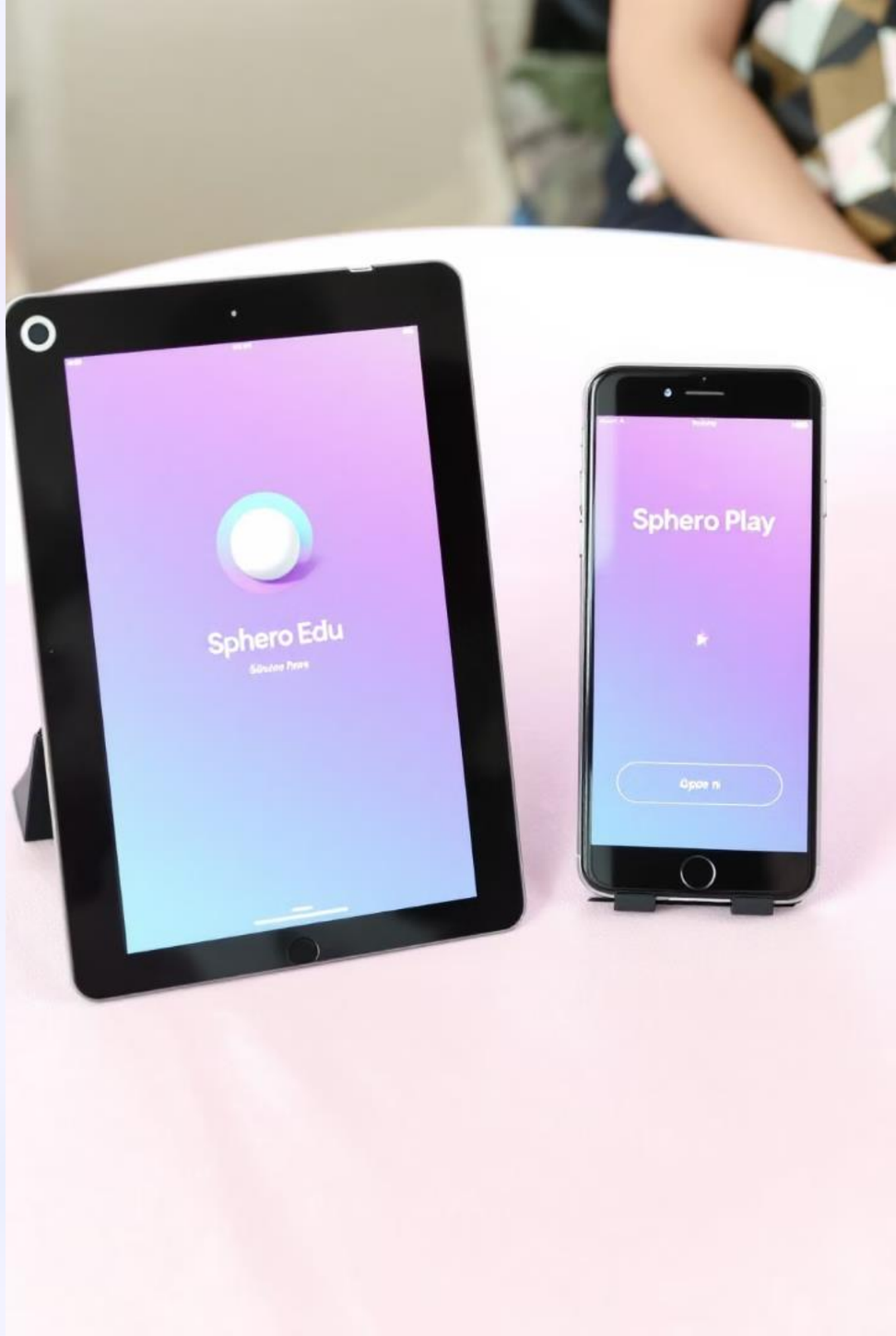
Main platform for programming Sphero robots, available on multiple devices.

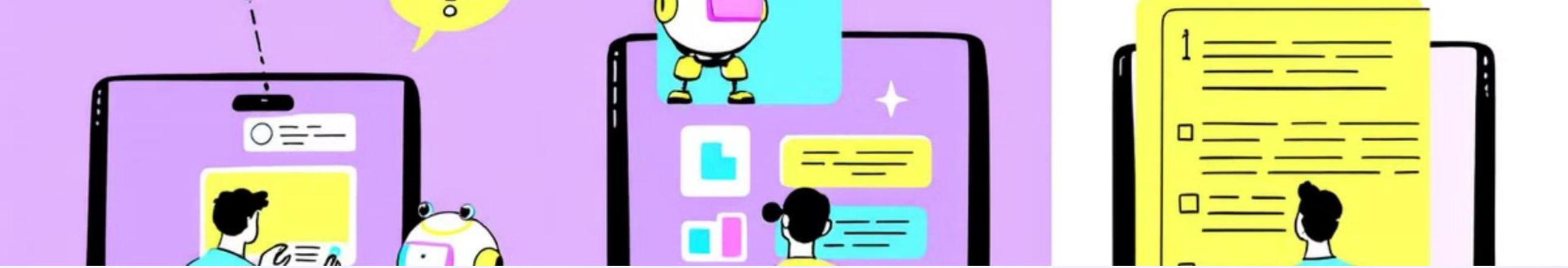
Sphero Play

App for casual users, featuring pre-programmed games and activities.

SDK

Software Development Kit for advanced users to create custom applications.





Coding Sphero Robots

1. **Draw**

   Simple path drawing for beginners.

2. **Blocks**

   Visual block-based programming for intermediate users.

3. **Text**

   JavaScript coding for advanced programmers.

Sphero Robotics Scratch

1

Drag and Drop

Use pre-made code blocks to build programs.

2

Connect Blocks

Snap blocks together to create sequences.

3

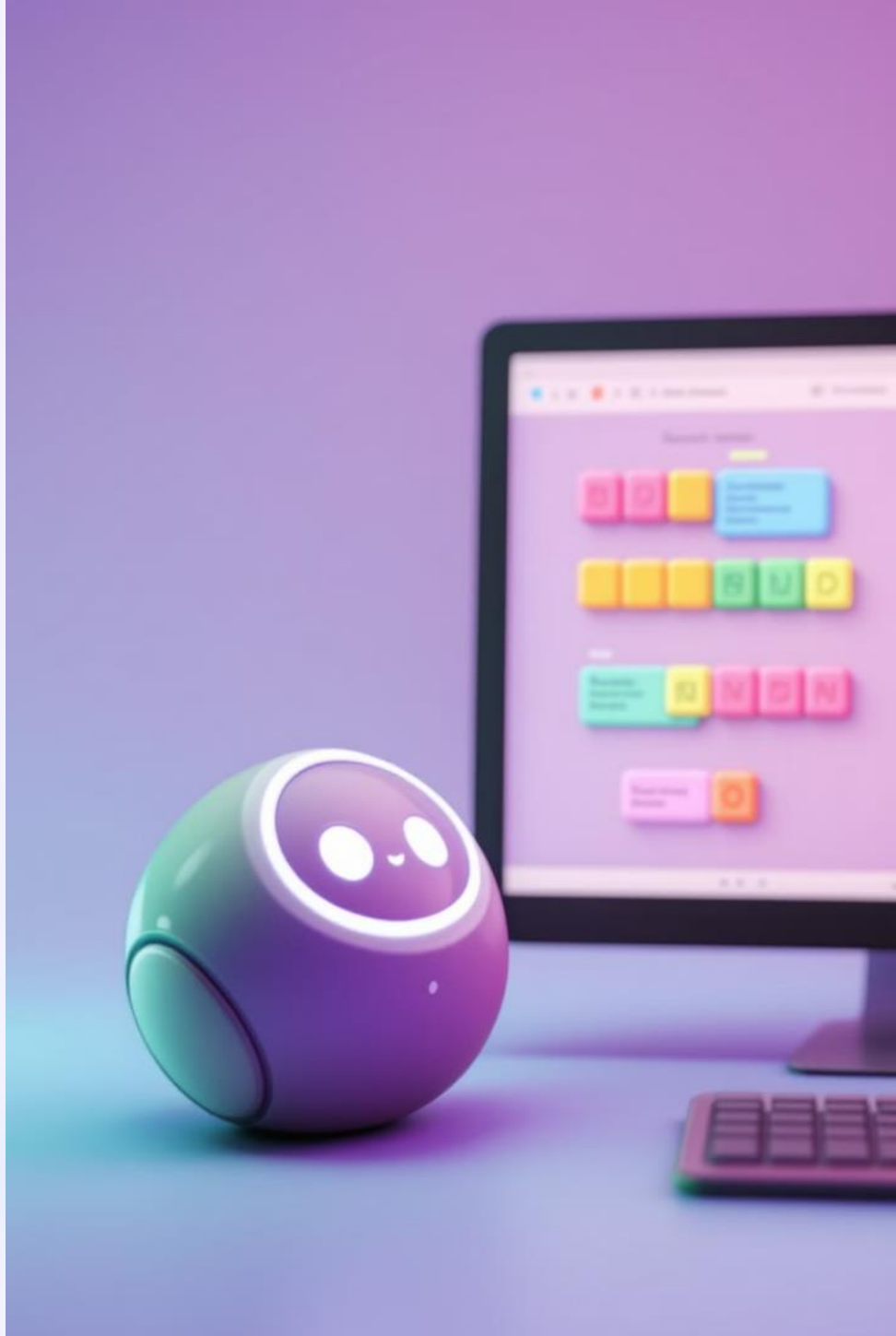
Customize Parameters

Adjust values within blocks for precise control.

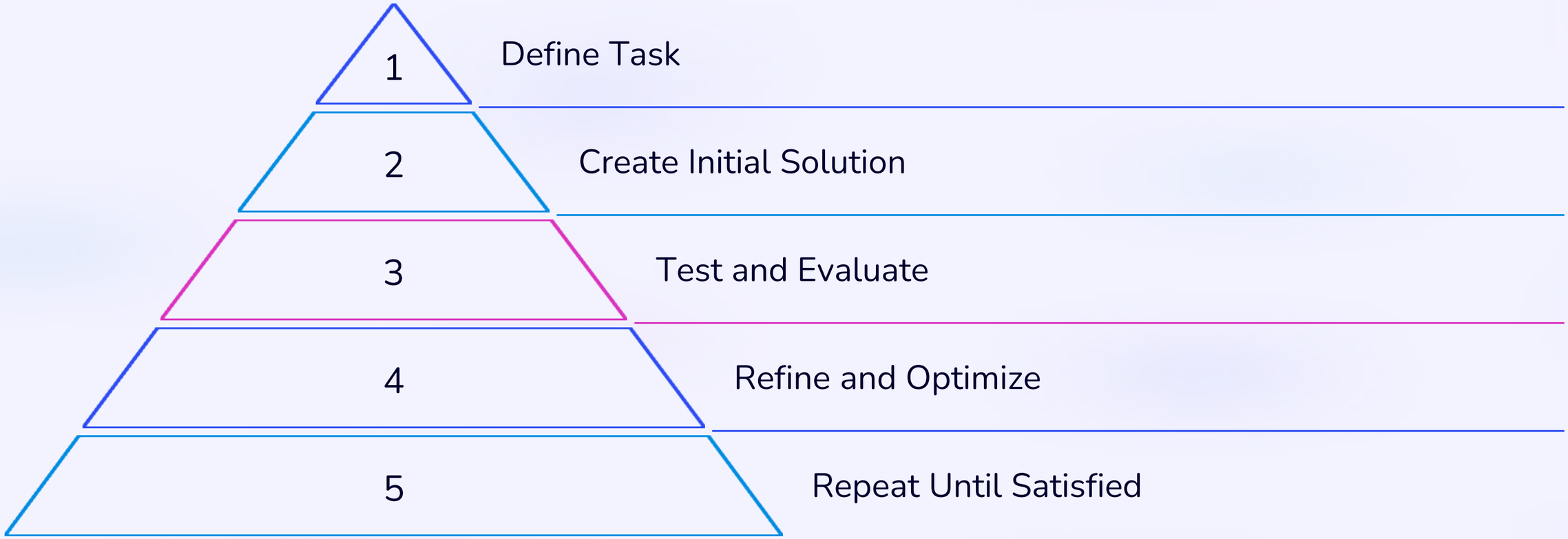
4

Run and Test

Execute your code and watch Sphero respond.



Sphero Robotics Iteration Algorithms



Iteration algorithms improve Sphero's performance through repeated refinement cycles.

Sphero Robotics Conditional Statements

If-Then

Execute code when a specific condition is met.

If-Then-Else

Choose between two actions based on a condition.

Switch-Case

Select from multiple code blocks based on variable value.

Sphero Robotics Looping Structures

For Loop

Repeat a set number of times.

While Loop

Repeat as long as a condition is true.

Do-While Loop

Execute at least once, then repeat if condition is true.

Sphero Robotics Event-driven Programming

1

Define Events

Identify triggers like collisions or gestures.

2

Create Event Handlers

Program responses to specific events.

3

Link Events to Actions

Connect triggers with corresponding behaviors.

4

Test and Refine

Ensure Sphero responds correctly to events.

Sphero Robotics Sensor Integration

Accelerometer

Detects speed and orientation changes.

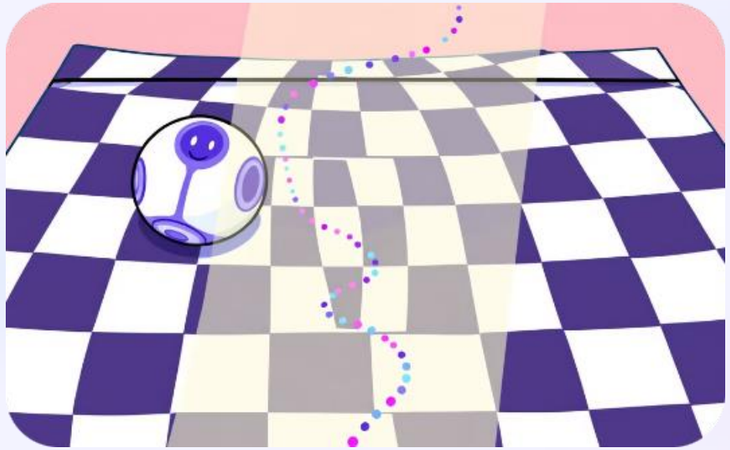
Gyroscope

Measures angular velocity and rotation.

Magnetometer

Determines Sphero's heading relative to magnetic north.

Sphero Robotics Data Visualization



Speed Graph

Visualize velocity changes during movement.

Path Heatmap

Display frequently traversed areas.

3D Orientation

Show robot's position in three-dimensional space.

Sphero Robotics Project-based Learning

1. **Maze Navigation**

   Program Sphero to autonomously navigate complex mazes.

2. **Light Painting**

   Create art using Sphero's LED and long-exposure photography.

3. **Sphero Olympics**

   Design competitive games testing speed, accuracy, and control.

4. **Data Collection**

   Use Sphero as a mobile sensor to gather environmental data.

Conclusion and Key Takeaways

1

Versatility

Sphero robots offer a wide range of applications and learning opportunities.

3

Coding Levels

From beginners to experts, Sphero provides multiple coding interfaces.

∞

Creativity

The possibilities for Sphero projects and applications are limitless.

Sphero robots make coding fun, interactive, and accessible for all skill levels.