Java Puzzle Ball
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Lesson 1-2
Object Oriented Thinking and Class Design
Exercise 1

• Play **Basic Puzzles 1 through 5.**
  – Your Goal: Design a solution that deflects the ball to Duke.

• Consider the following:
  – What objects do you find on the field of play?
  – What happens when you put a triangle wall or simple wall icon on the blue wheel?

![Triangle Wall Icon](image1)

![Simple Wall Icon](image2)
Object Types

What objects did you find on the field of play?

• Ball
• Duke
• LevelGeometry
• RedBumper
• BlueBumper

Let’s take a closer look at this object.
BlueBumper Objects

What happens when you put a triangle wall or simple wall icon on a blue wheel?

• A wall appears on every instance of a blue bumper object.
• Walls give bumpers behaviors that deflect and interact with the ball.
• All blue bumper instances share these same behaviors.
Describing a BlueBumper

• Properties:
  – Color
  – Shape
  – x-position
  – y-position

• Behaviors:
  – Make ping sound
  – Flash
  – Deflect ball (via Simple Wall)
  – Deflect ball (via Triangle Wall)
Describing a Ball

• Properties:
  – Direction
  – x-position
  – y-position

• Behaviors:
  – Make ping sound
  – Change direction
  – Change x-position
  – Change y-position
Why Does This Matter?

• We've observed important aspects of object-oriented programming.
  – Objects can be described as a combination of properties and behaviors.
  – There may be many instances of the same object type.
  – All instances of an object share the same behaviors.

• Once you understand these principals conceptually, it's simply a matter of translating ideas into Java syntax and terminology.

• Remember these observations as lessons and exercises become increasingly technical.
public class BlueBumper {
    public Color color = Color.BLUE;
    public Shape shape = Shape.RECT;
    public int xPosition;
    public int yPosition;
    public void ping() {
        System.out.println("Ping");
    }
    public void flash() {
        System.out.println("Flash");
    }
    public void methodA() {
        simpleWall();
    }
}

Translating into Java Syntax

Properties

Behaviors
Java Terminology

Class declaration

```
public class BlueBumper {
    private Color color = Color.BLUE;
    private Shape shape = Shape.RECT;
    private int xPosition;
    private int yPosition;

    public void ping(){
        System.out.println("Ping");
    }

    public void flash(){
        System.out.println("Flash");
    }

    public void methodA(){
        simpleWall();
    }
}
```
Your Challenge as a Java Programmer

It's a design challenge similar to what you faced in Java Puzzle Ball:

• Consider what type of objects should exist in your program.
• Consider the properties and behaviors of these object types.
  – Design your code with the understanding that every instance of an object will possess the same properties and behaviors.
  – Some behaviors may be inappropriate for a given object type.