



ORACLE

# ***JAVA PUZZLE BALL***

Lesson 1

Basic Puzzles 1-5

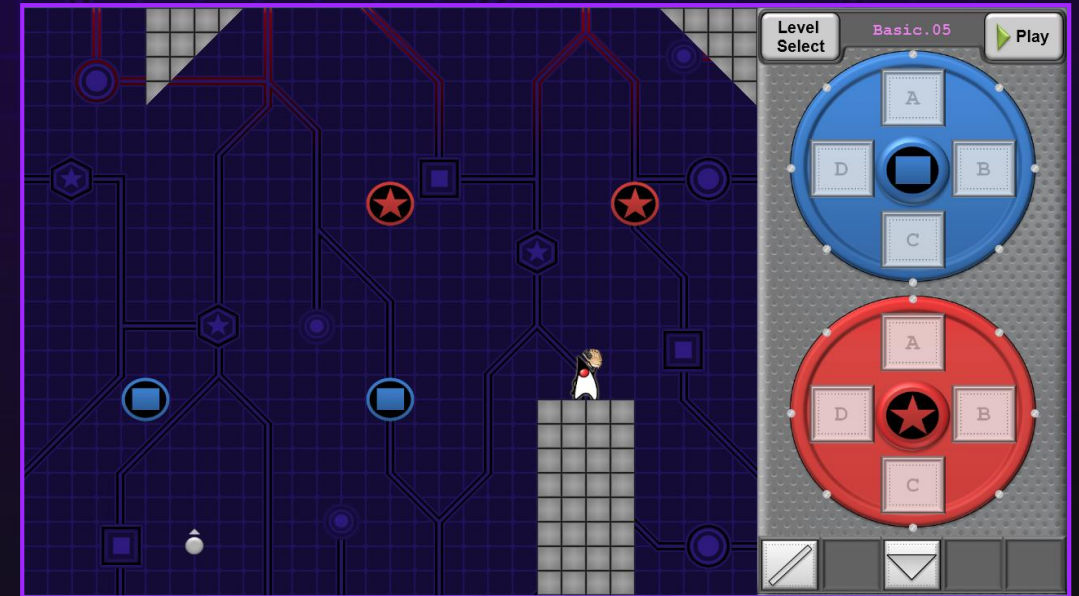
Object Oriented Thinking and Class Design



[www.oracle.com/goto/JavaGame](http://www.oracle.com/goto/JavaGame)

# Did You Try Basic Puzzles 1-5?

- What objects do you find on the field of play?
- What happens when you put a Triangle Wall or Simple Wall icon on the BlueWheel?

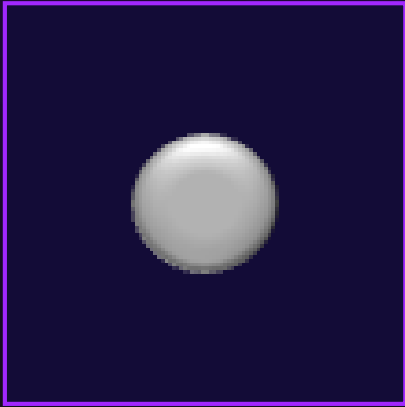


**Triangle Wall Icon**

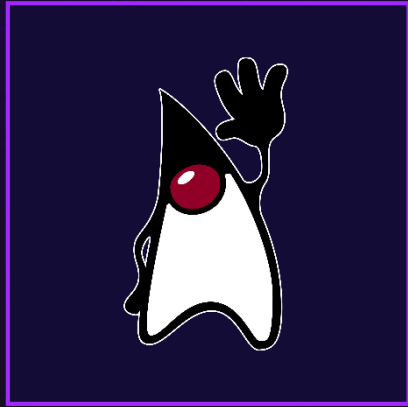


**Simple Wall Icon**

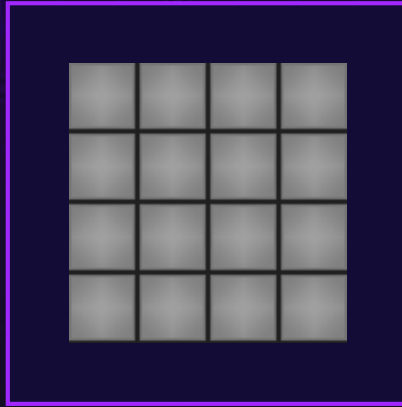
# What Objects Do You Find On the Field of Play?



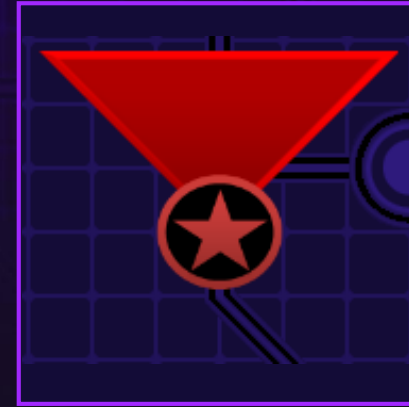
**Ball**



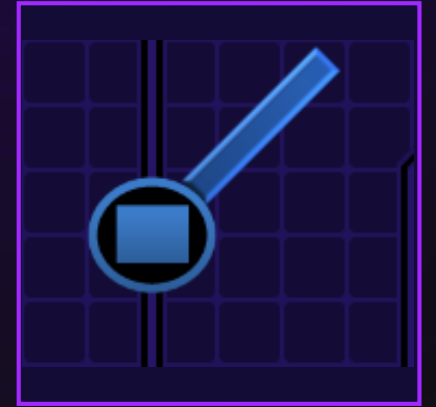
**Duke**



**LevelGeometry**



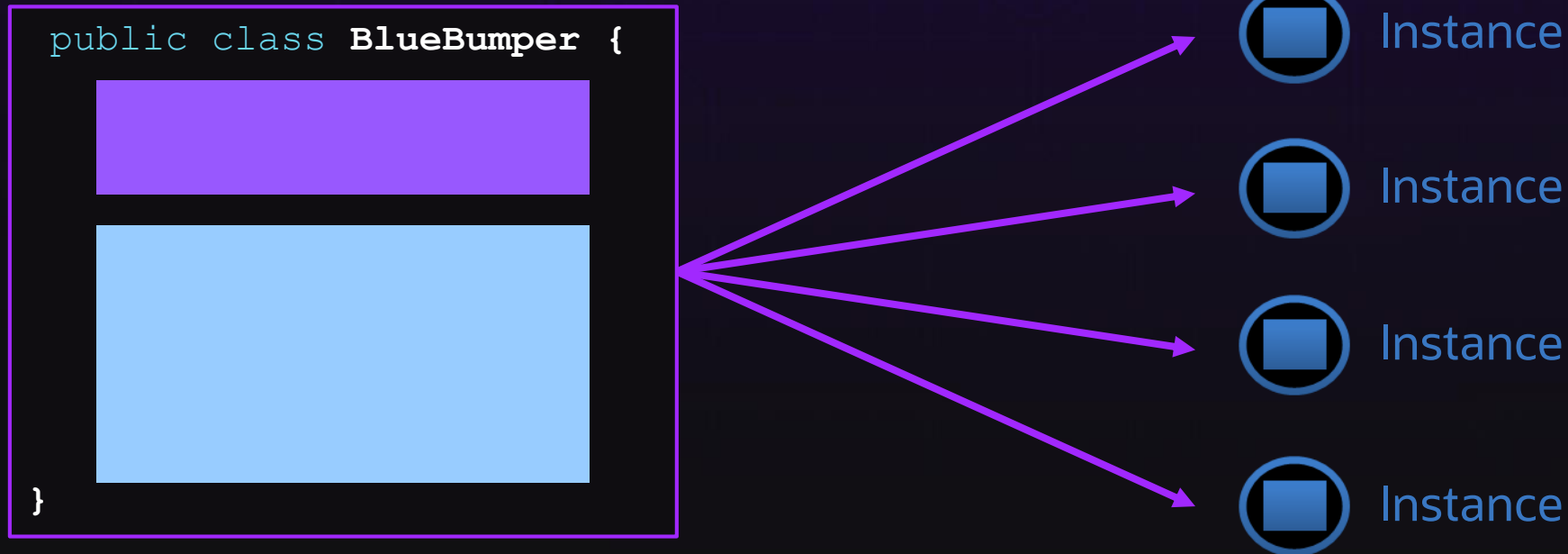
**RedBumper**



**BlueBumper**


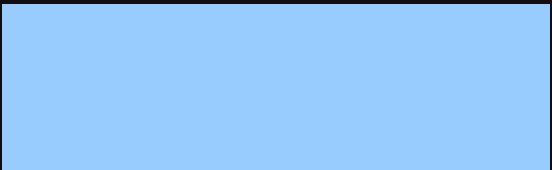
# Java is an Object-Oriented Language




- Programmers think in terms of objects.
- Each type of object is outlined in a piece of code known as a **class**.
- Many instances of that object type can be generated from the class.


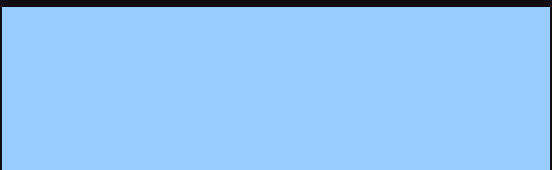






# One Class Exists for Each Object Type

```
public class Ball {  
      
      
}
```

 Instance  
 Instance  
 Instance

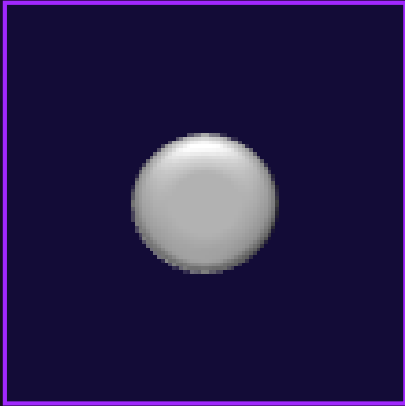
```
public class BlueBumper {  
      
      
}
```

 Instance  
 Instance  
 Instance

# A Class Outlines Properties and Behaviors

```
1 public class Ball {  
2  
3  
4     Properties  
5  
6  
7  
8  
9  
10  
11     Behaviors  
12  
13  
14  
15  
16 }
```

# Describing a Ball



## Properties:

- Direction
- x-position
- y-position

## Behaviors:

- Make ping sound
- Change direction
- Change x-position
- Change y-position

# Describing a BlueBumper



## Properties:

- Color
- Shape
- x-position
- y-position

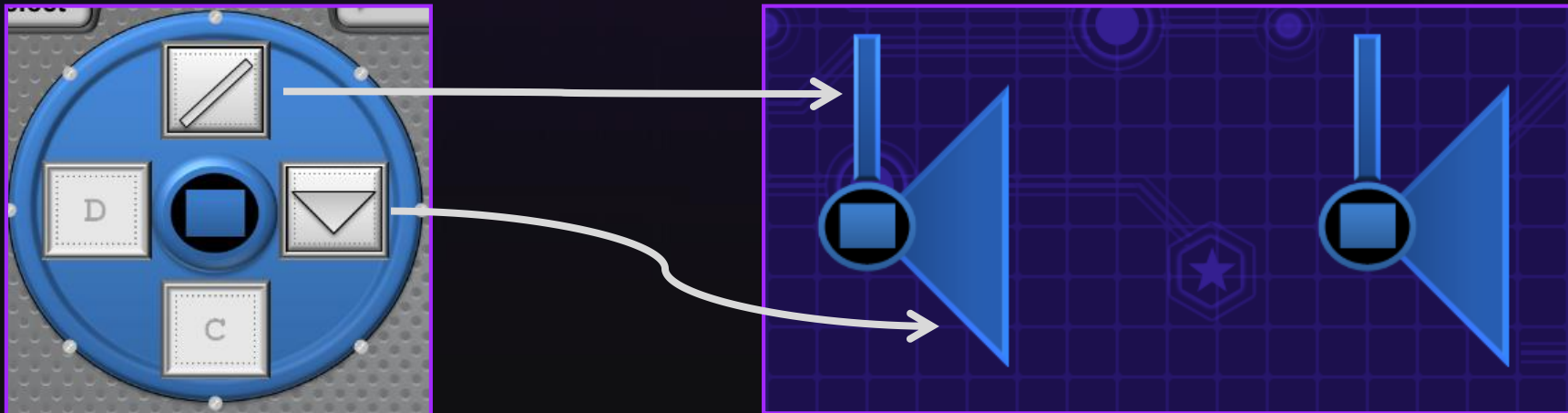
## Behaviors:

- Make ping sound
- Flash
- Deflect ball (via Simple Wall)
- Deflect ball (via Triangle Wall)



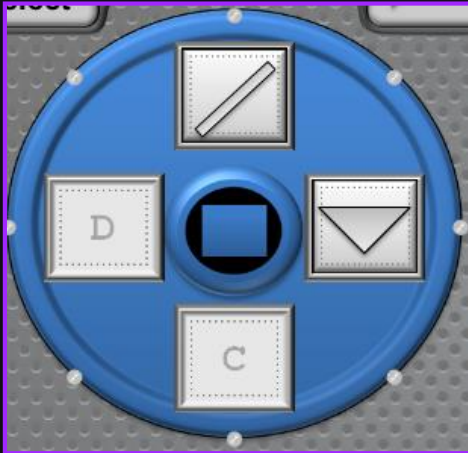
# What Happens When You Put a Triangle Wall or Simple Wall Icon on a BlueWheel?

- A wall appears on every **instance** of a blue bumper **object**.
- Walls give bumpers **behaviors** to deflect and interact with the ball.
- All BlueBumper instances share these same behaviors.
- You're designing the BlueBumper class by specifying behaviors!



# Your Challenge as a Java Programmer

- It's a design challenge like Java Puzzle Ball.
- Consider what object types should exist in your program.
- Consider the properties and behaviors of those object types.
  - Design classes with the understanding that every instance of an object type shares the same properties and behaviors.
  - Some behaviors may be inappropriate for a specific object type.



# Official Java Terminology

```
1 public class BlueBumper {
```

Fields

Methods

```
16 }
```

# Translating into Java Syntax

## Class declaration

```
1 public class BlueBumper {  
2     public Color color = Color.BLUE;  
3     public Shape shape = Shape.RECT;  
4     public int xPosition;  
5     public int yPosition;  
6  
7     public void ping() {  
8         System.out.println("Ping");  
9     }  
10    public void flash() {  
11        System.out.println("Flash");  
12    }  
13    public void methodA() {  
14        simpleWall();  
15    }  
16 }
```

**Fields**  
(Properties)  
(Attributes)

**Methods**  
(Behaviors)

# Further Learning

Edit code and learn more in the multi-day version of this course:

- [www.oracle.com/goto/JavaGame](http://www.oracle.com/goto/JavaGame)

