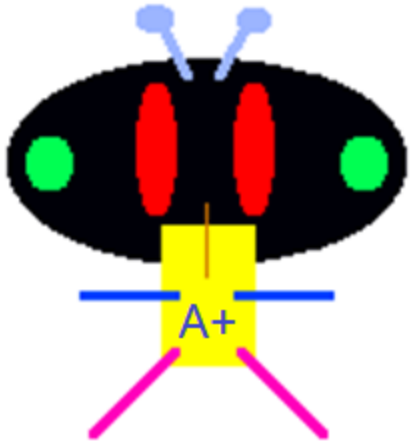
A+ Computer Science

METHODS

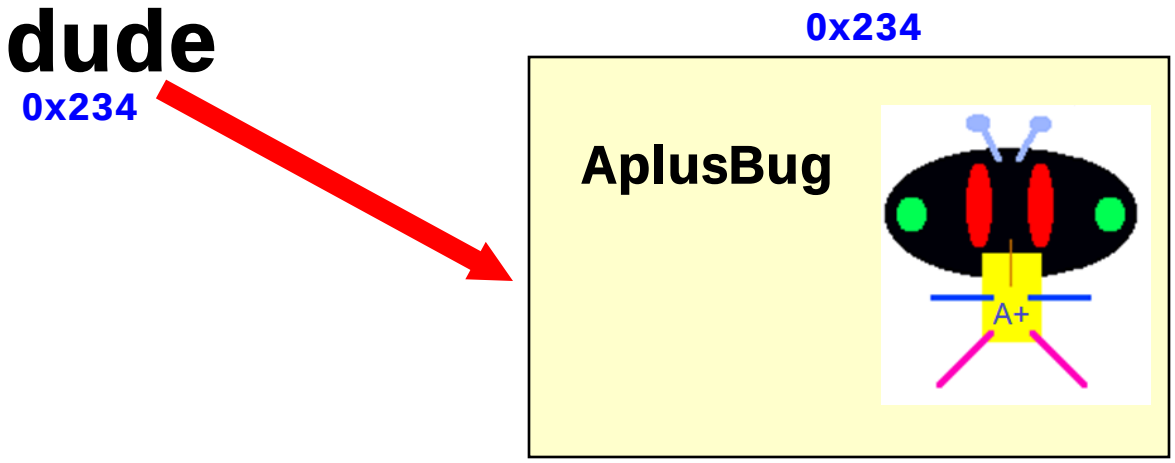
Instantiation

```
AplusBug dude = new AplusBug();
```



Instantiation

```
AplusBug dude  = new AplusBug();
```



dude is a reference variable that refers to an AplusBug object.

Methods

What is a method?

A method is a storage location for related program statements. When called, a method usually performs a specific task.

System.out.println( )

Common Methods

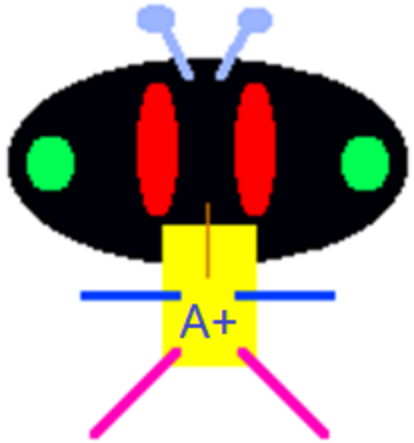
Math.random()

keyboard.nextInt( )

System.out.println( )

Methods

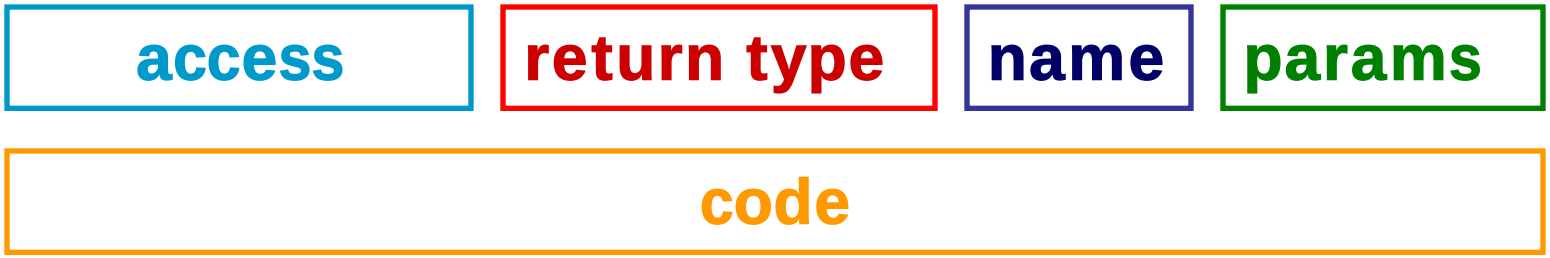
```
public void speak()
{
  out.println("chirp-chirp");
}
```



OUTPUT

chirp-chirp

Methods




```
public          void        speak(    )
{
  System.out.println("chirp-chirp");
}
```

Public

All members with public access can be accessed or modified inside and outside of the class where they are defined.

```
public class Turkey
{
  public void speak()
  {
    out.println("gobble-gobble");
  }

  public void sayName()
  {
    out.println("big bird");
  }
}
```

Turkey

OUTPUT

```
gobble-gobble
big bird
gobble-gobble
big bird
gobble-gobble
```

```
//code in the main of another class
Turkey bird = new Turkey();
bird.speak();
bird.sayName();
bird.speak();
bird.sayName();
bird.speak();
```

Turkey

```
public class Turkey
{
  public void speak()
  {
    out.println("gobble-gobble");
  }

  public void sayName()
  {
    out.println("big bird");
    speak();
  }
}
```

OUTPUT

```
gobble-gobble
big bird
gobble-gobble
gobble-gobble
big bird
gobble-gobble
gobble-gobble
```

```
//code in the main of another class
Turkey bird = new Turkey();
bird.speak();
bird.sayName();
bird.speak();
bird.sayName();
bird.speak();
```

turkey.java
turkeyrunner.java

Work on Programs!

Crank

Some Code!

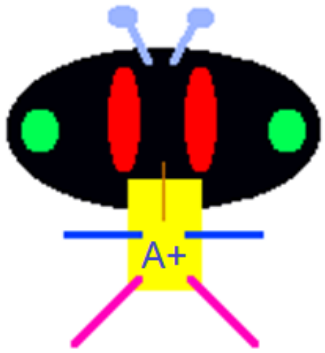
Graphics and Constructors

Constructors

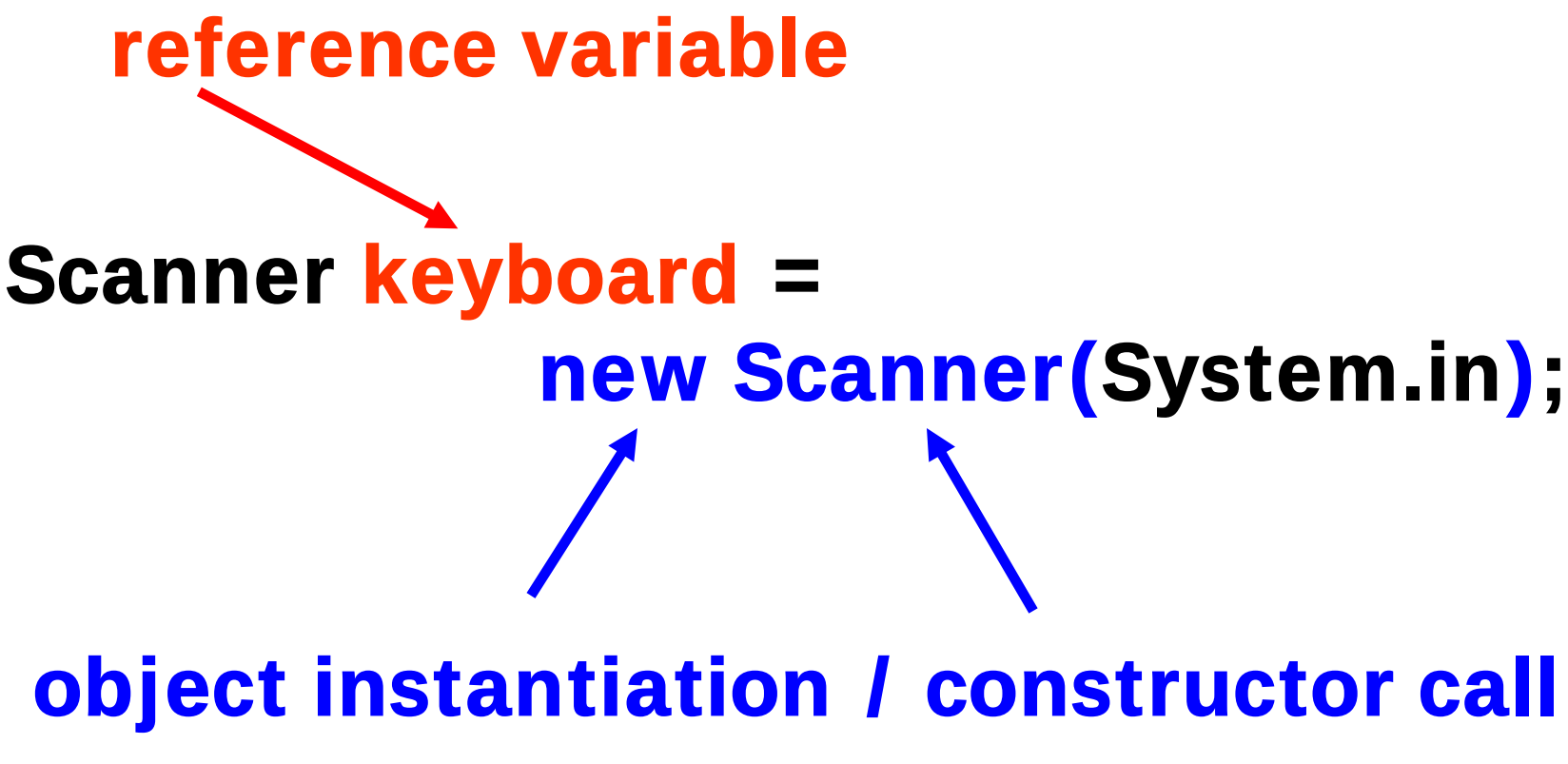
Constructors always have the same name as the class.

GraphOne test = new GraphOne();

AplusBug rob = new AplusBug();



Constructors



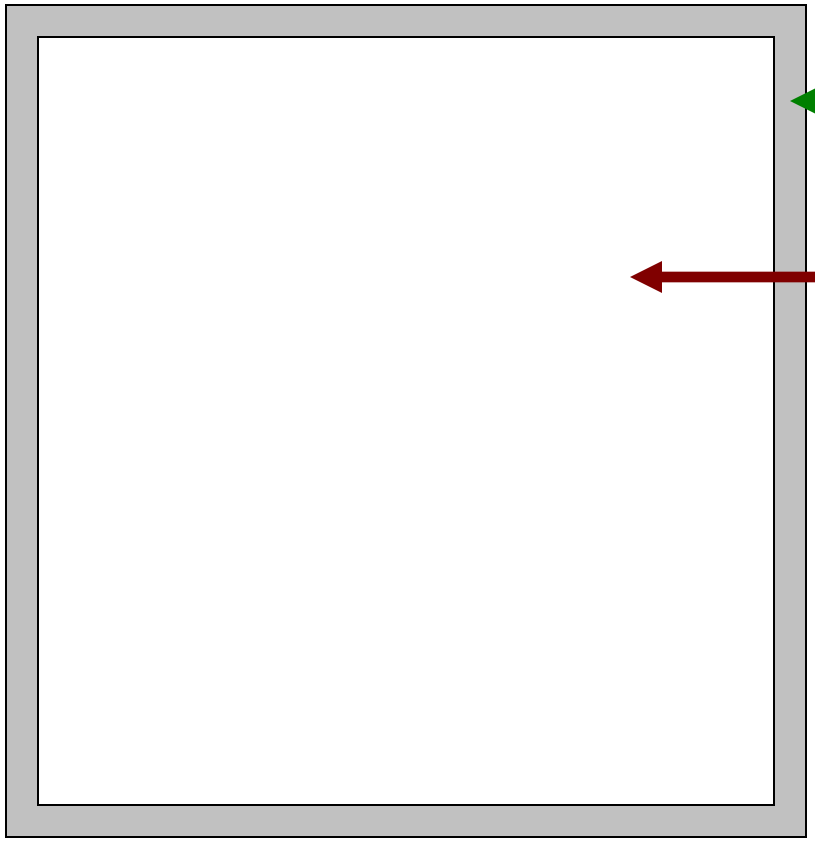
Constructors

```
public class GraphicsRunner extends JFrame
{
  private static final int WIDTH = 640;
  private static final int HEIGHT = 480;

  public GraphicsRunner()
  {
    setSize(WIDTH,HEIGHT);
    getContentPane().add(  new Circles()  );
    setVisible(true);
  }

  public static void main( String args[] )
  {
    GraphicsRunner run = new GraphicsRunner();
  }
}
```

the constructor

constructor call

Frame



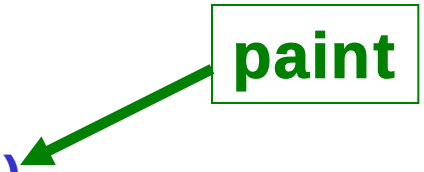
Frame / JFrame

Canvas / JPanel

The Frame is used to hold up / display a Canvas or Panel.

Paint

```
public class Circles extends Canvas
{

  //constructors

  public void paint( Graphics window )
  {
    window.setColor(Color.BLACK);
    window.drawString("Circles", 50, 50);

    window.setColor(Color.BLUE);
    window.drawOval(500,300,40,40);
  }

  //other methods

}
```



paint() is called automatically when you instantiate the class containing the paint method.

When an event is triggered that requires a redraw, paint is called again.

To call paint() without a Graphics parameter, you can use the repaint() method.

graphicsrunner.java
circles.java

Graphics and Methods

Graphics

frequently used methods

Name	Use
setColor(x)	sets the current drawing color to x
drawString(s,x,y)	draws String s at spot x,y
drawOval(x,y,w,h)	draws an unfilled oval at spot x,y that is w wide and h tall
fillOval(x,y,w,h)	draws a filled oval at spot x,y that is w wide and h tall

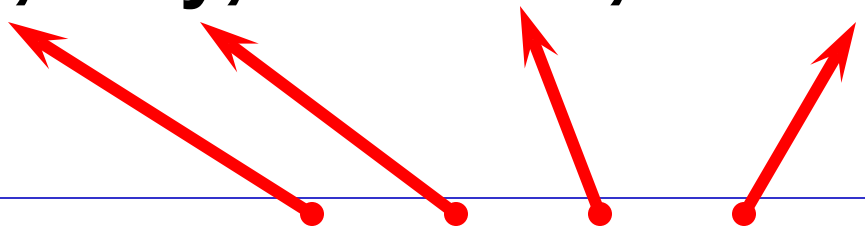
```
import java.awt.Graphics;
import java.awt.Color;
import javax.swing.JFrame;
```

Passing Parameters

A parameter / argument is a channel used to pass information to a method. setColor() is a method of the Graphics class the receives a Color.

Passing Parameters

void fillRect (int x, int y, int width, int height)

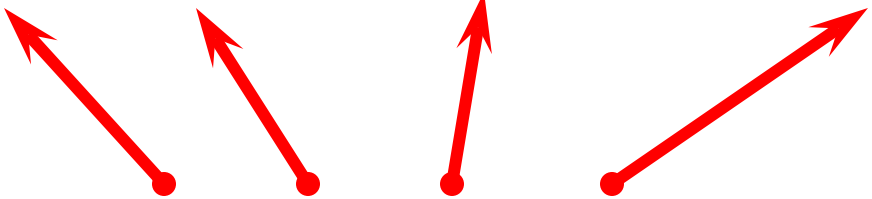


window.fillRect(10, 50, 30, 70);

method call with parameters

Passing Parameters

```
void fillRect(int x, int y, int width, int height)
```



```
window.fillRect( 10, 50, 30, 70 );
```

The call to fillRect would draw a rectangle at position 10,50 with a width of 30 and a height of 70.

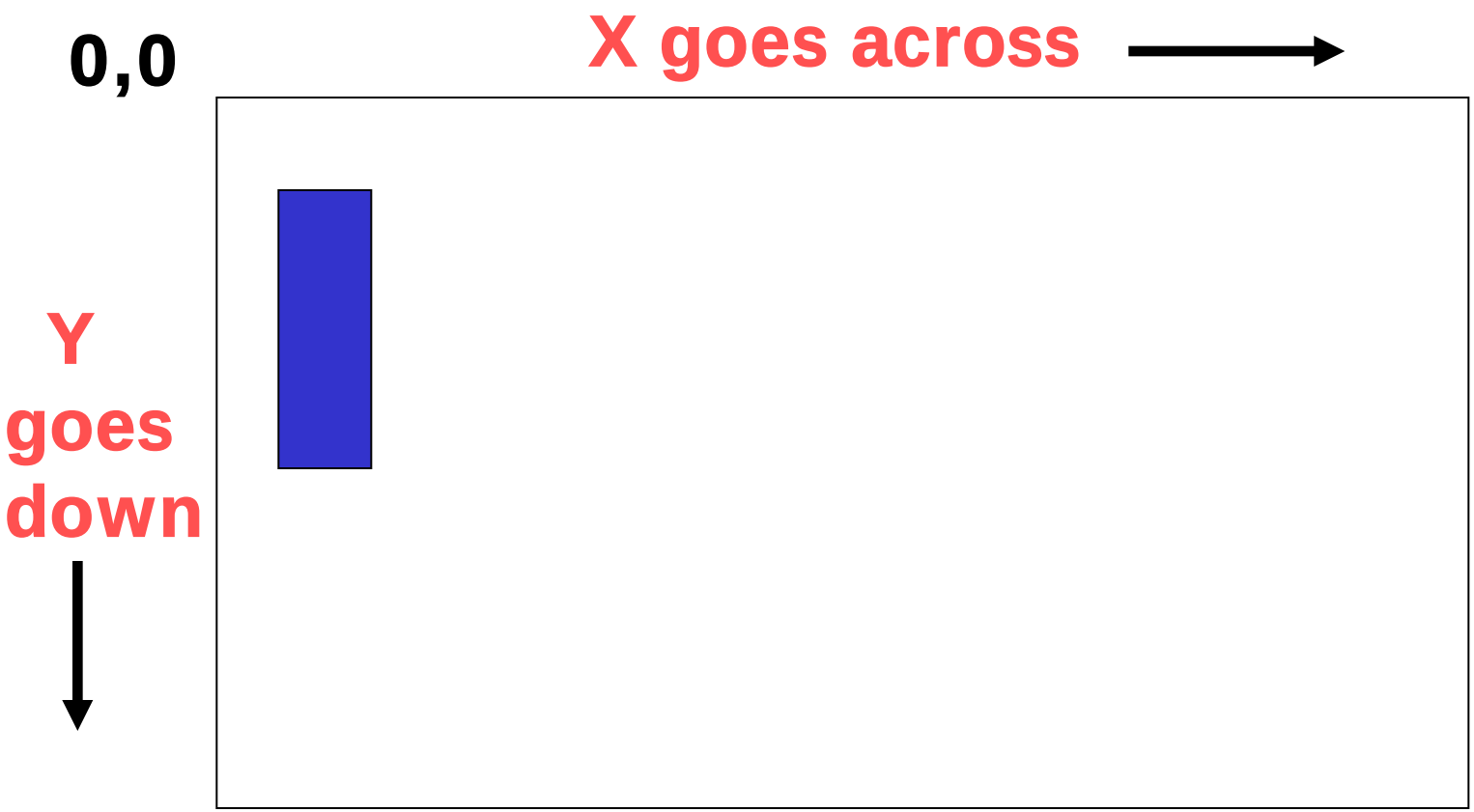
Graphics

frequently used methods

Name	Use
drawLine(a,b,c,d)	draws a line starting at point a,b and going to point c,d
drawRect(x,y,w,h)	draws an unfilled rectangle at spot x,y that is w wide and h tall
fillRect(x,y,w,h)	draws a filled rectangle at spot x,y that is w wide and h tall

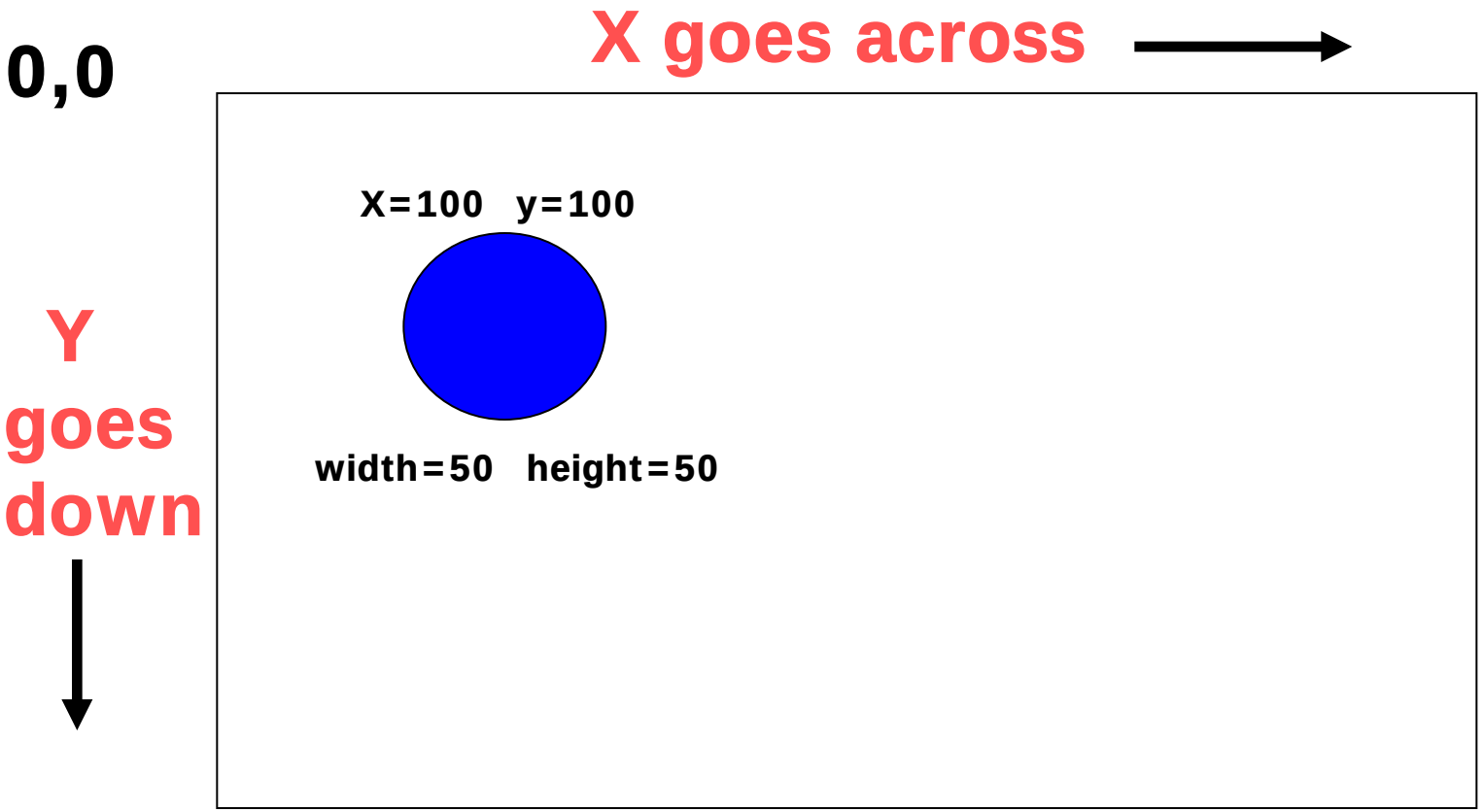
```
import java.awt.Graphics;
import java.awt.Color;
import javax.swing.JFrame;
```

Graphics




```
window.fillRect( 10, 50, 30, 70 );
```

Passing Parameters




```
window.fillOval( 100, 100, 50, 50 );
```

Rectangles

```
public void paint( Graphics window )
{
  window.setColor(Color.BLUE);
  window.fillRect(150, 300, 100, 20);
  window.setColor(Color.GRAY);
  window.drawRect(200,80,50,50);
}
```

rectangles.java

lines.java

Graphics

frequently used methods

Name	Use
drawArc(x,y,w,h,startAngle,arcAngle)	draws an arc at spot x,y that is w wide and h tall
fillArc(x,y,w,h,startAngle,arcAngle)	draws a filled arc at spot x,y that is w wide and h tall
startAngle specifies the start of the arc arcAngle specifies the length of the arc	

```
import java.awt.Graphics;
import java.awt.Color;
import javax.swing.JFrame;
```

arcs.java

fonts.java

colors.java

Work on Programs!

Crank

Some Code!

A+ Computer Science

METHODS