Variables, Fields, and Parameters

Variable - named location that stores a value

```java
int x = 7; // declaration
// variable assignment
int ageInYears = 29; // 29 is the initial value for ageInYears
ageInYears = 21;  // set ageInYears to now store 21
```

Numbers

```java
double pi = 3.14159; // decimal
// integers are never rounded up
```

1/2 = 0, because java gives the remainder

int / 0 = runtime exception

float / 0 = infinity

Scope

- marked by pairs of braces { }

Fields

- Variables defined at the beginning of a class
- Private, cannot be accessed outside the class

```java
public class Rectangle
{
    private int length;
    private int width;
    private int xCoord;
    private int yCoord;

    // other parts of the class go here ...
}

// add the constructor
    public Rectangle(int myLength, int myWidth, int initialX, int initialY)
    {
        this.length = myLength; //this. refers to the field
        this.width = myWidth;
        this.xCoord = initialX;
        this.yCoord = initialY;
    }

// call the constructor
Rectangle rectangle1 = new Rectangle(2, 5, 0, 0);
```

Since fields are private, so getter and setter methods are needed to access them

Setter Method

```java
public void setXCoord(int newValue)
    {
        this.xCoord = newValue;
    }
```

Getter Method

```java
public int getLength()
    {
        return this.length;
    }
```

Fields in testing

```java
public class FlowerPickerTest
    extends TestCase
{
    private Lab04Island island; //declare fields
    private FlowerPicker picker;

    public void setUp()
    {
        this.island = new Lab04Island(); //instantiate in setup
        this.picker = new FlowerPicker();
        this.island.addObject(this.picker, 1, 2);
    }
```