Arrays

1. Declare an array variable to hold elements of a given type

```
String[] names;
```

2. Create (size) the array and assign the new array to the array variable

```
names = new String[100];
```

3. Assign values to the array locations

```
for (int i=0; i < names.length; i++) {
  names[i] = "George the " + i + "th";
}
```

4. Use elements of the array

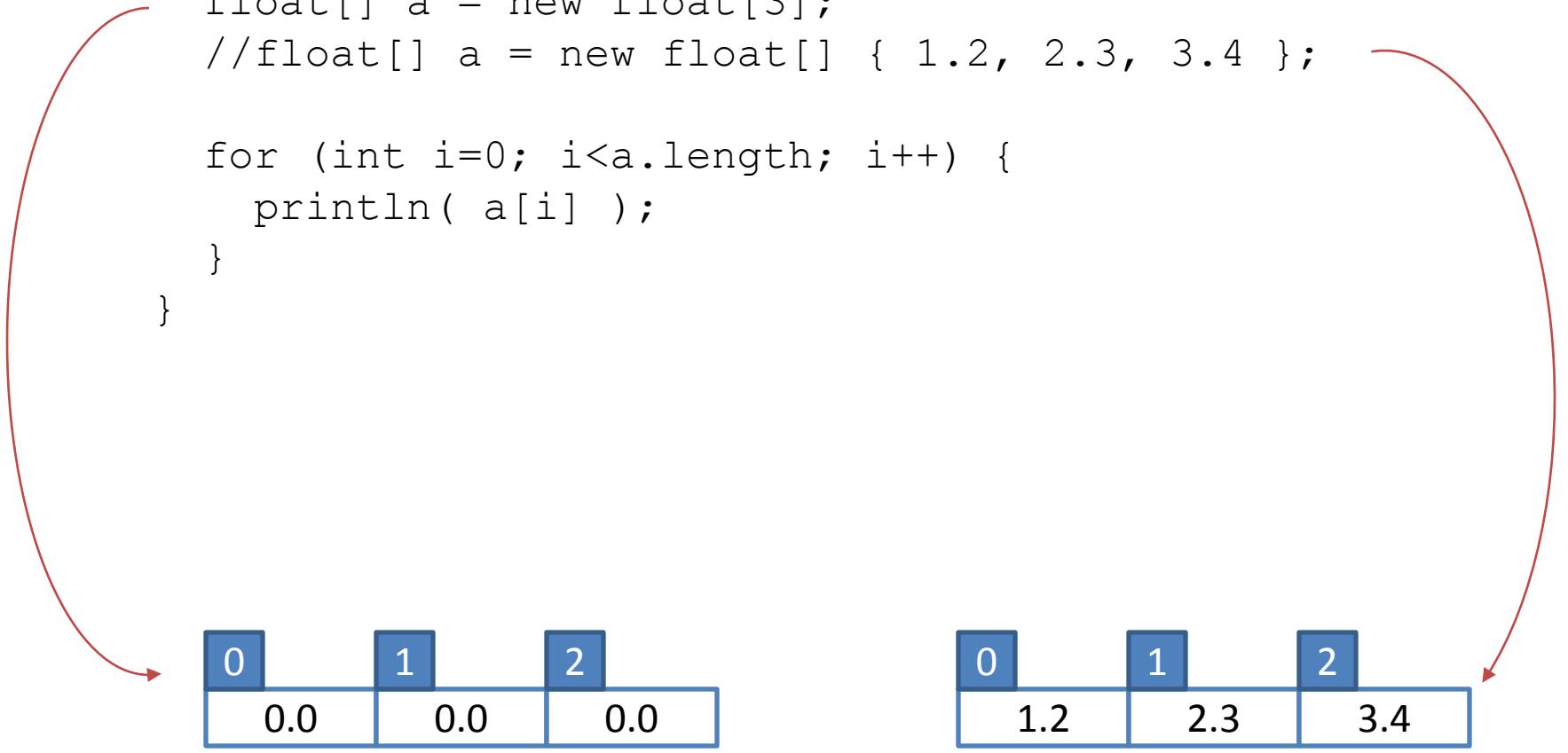
```
int r = int( random( names.length ) );
println("My new name is " + names[r]);
```

Arrays

```
void setup() {

  float[] a = new float[3];
  //float[] a = new float[] { 1.2, 2.3, 3.4 };

  for (int i=0; i<a.length; i++) {
    println( a[i] );
  }
}
```



Objects

Declare a class – instructions for creating a new object

1. Start the new class declaration with a class keyword, object name and curly brackets

2. Declare required fields inside the curly brackets (if any)
   - Fields are variables declared within the class

3. Declare a constructor, which is executed when a new object is created
   - Similar to a function
   - Same name as class
   - No return type at all (not even void)
   - Declare arguments
   - Add constructor implementation, which may include initializing fields with arguments

4. Declare required methods inside the class (if any)
   - Similar to functions

```
// A simple Box class
class Mover {
  float x, y, vx, vy;

  Mover(float tx, float ty) {
    x = tx;     // x position
    y = ty;     // y position
    vx = 1.0;   // x velocity
    vy = 0.0;   // y velocity
  }

  void step() {
    x = x + vx;         // Motion
    if (x > width || x < 0.0) {
      vx = -vx;
    }
  }

  void draw() {
    fill(200);
    rect(x, y, 20, 20);
  }

}
```

1. Start the new class declaration with a class keyword, object type name and curly brackets
2. Declare required fields inside the class (if any)
3. Declare a constructor, which is executed when a new object is created
4. Declare required methods inside the class (if any)

BoxMover.pde

Using Objects

```
// BoxMover
int nBoxes = 20;
Mover[] boxes = new Mover[nBoxes];     // (1) Variable to hold objects

int nextIndex = 0;

void setup() {
  size(500, 500);
  rectMode(CENTER);
}

void draw() {
  background(0);

  for (int i=0; i<boxes.length; i++) {
    if (boxes[i] != null) {
      boxes[i].step();                 // (3) Call object methods
      boxes[i].draw();
    }
  }
}

void mousePressed() {
  // (2) Create a new Box at mouse position and add to the array
  boxes[nextIndex] = new Mover(mouseX, mouseY);
  nextIndex = (nextIndex + 1) % nBoxes;
}
```