Drawing Basics

Simple Snowman:

```
1  ellipse(200,300,150,150);
2  ellipse(200,215,110,110);
3  ellipse(200,150,75,75);
4
```

Waving Snowman:

```
1  rect(0,350,400,50);
2  ellipse(200, 300, 150, 150);
3  ellipse(200, 200, 100, 100);
4  ellipse(200, 120, 75, 75);
5  line(160,194,80,139);
6  line(240,200,324,147);
7  |
```

Coloring

Sunny Snowy Day:

```
1   background (0, 21, 255);
2
3   // The ground
4   fill (27, 125, 2);
5   rect(0, 300, 400, 100);
6
7   // The sun
8   fill (255, 255, 0);
9   ellipse(80, 64, 100, 100);
10
11  // The snowman
12  fill (255, 255, 255);
13  ellipse(200, 300, 150, 150);
14  ellipse(200, 200, 100, 100);
15  ellipse(200, 120, 75, 75);
16
```

Variables

Bucktooth Bunny:

```
1  var eyeSize = 50;
2  var tooth = 30;
3  ellipse(150, 70, 60, 120);   // left ear
4  ellipse(240, 70, 60, 120);   // right ear
5
6  ellipse(200, 170, 150, 150);     // face
7
8  fill(0, 0, 0);
9  ellipse(170, 150, eyeSize, eyeSize);   // left eye
10 ellipse(230, 150, eyeSize, eyeSize);   // right eye
11
12 line(150, 200, 250, 200);    // mouth
13
14 noFill();
15 rect(185, 200, 15, tooth); // left tooth
16 rect(200, 200, 15, tooth); // right tooth
17
```

Funky Frog:

```
1  var x = 200;
2  var y = 250;
3
4  noStroke();
5  fill(30, 204, 91); // a nice froggy green!
6
7  ellipse(x, y, 200, 100); // face
8  ellipse(x - 50, y - 50, 40, 40); // left eye socket
9  ellipse(x + 50, y - 50, 40, 40); // right eye socket
10
11
12 fill(255, 255, 255); // for the whites of the eyes!
13 ellipse(x - 50, y - 50, 30, 30); // left eyeball
14 ellipse(x + 50, y - 50, 30, 30); // right eyeball
15 fill(0,0,0);
16 rect(x - 50, y - 50, 10, 10); // left eye socket
17 rect(x + 50, y - 50, 10, 10); // right eye socket
18 fill(0, 0, 0);
19
20 ellipse(x,y,100,50);
21 |
```

Animation Basics

Exploding Sun:

```
1  noStroke();
2  // the beautiful blue sky
3  background(82, 222, 240);
4
5  // the starting size for the sun
6  var sunSize = 30;
7  draw = function() {
8    sunSize = sunSize +1;
9
10   // The sun, a little circle on the horizon
11 fill(255, 204, 0);
12 ellipse(200, 298, sunSize, sunSize);
13
14 // The land, blocking half of the sun
15 fill(76, 168, 67);
16 rect(0, 300, 400, 100);
17 };
```

Parting Clouds:

```
partingcoulds.js                    ×

1   noStroke();
2   var leftX = 116;
3   var rightX = 316;
4   var sunRadius = 100;
5   draw = function() {
6       background(184, 236, 255);
7       leftX --;
8       rightX ++;
9       sunRadius +=2;
10      fill(255, 170, 0);
11      ellipse(200, 100, sunRadius, sunRadius);
12      // clouds
13      fill(255, 255, 255);
14      // left cloud
15      ellipse(leftX, 150, 126, 97);
16      ellipse(leftX+62, 150, 70, 60);
17      ellipse(leftX-62, 150, 70, 60);
18      // right cloud
19      ellipse(rightX, 100, 126, 97);
20      ellipse(rightX+62, 100, 70, 60);
21      ellipse(rightX-62, 100, 70, 60);
22  };
```

Interactive Programs

Tasty Tomato:

```
 1  background(255, 255, 255);
 2
 3  // tomato
 4  noStroke();
 5  fill(224, 90, 90);
 6  ellipse(150, 200, 150, 150);
 7  ellipse(212, 200, 150, 150);
 8
 9  // stem
10  fill(48, 130, 31);
11  rect(176, 103, 12, 32);
12
13  // take a bite out of the tomato!
14  draw = function() {
15  fill(255, 255, 255);
16  ellipse(mouseX, mouseY, 60, 60);
17  };
18
```

Mouse movement Mania:

```
1
2
3  draw = function() {
4      stroke(184, mouseY, 184);
5      fill(mouseX, 0, mouseY);
6      ellipse(mouseX, mouseY, mouseX, 10);
7  };
```

Resizing with Variables

Brown Bear Eyes:

```
 1
 2  noStroke();
 3  var x = 200;
 4  var y = 250;
 5  var faceSize = 450;
 6
 7  // ears
 8  var earSize=faceSize*1/2;
 9  fill(89, 52, 17);
10  ellipse(x-faceSize*2/5, y-faceSize*2/5, earSize, earSize);
11  ellipse(x+faceSize*2/5, y-faceSize*2/5, earSize, earSize);
12
13  // face
14  fill(163, 113, 5);
15  ellipse(x, y, faceSize, faceSize);
16
17  var eyes = faceSize/8;
18  //eyes
19  fill(0, 0, 0);
20  ellipse(x-faceSize/4, y - faceSize/8, eyes, eyes);
21  ellipse(x+faceSize/4, y - faceSize/8, eyes, eyes);
22
23  //nose
24  fill(89, 52, 20);
25  ellipse(x, y+faceSize/8, faceSize*4/15, faceSize/5);
26
```

Text and Strings

My Favorite Foods:

```
1  fill(255, 0, 0);
2  textSize(20);
3  text("My Favorite Foods ", 0, 20);
4  text("1.Pizza", 0, 40);
5  text("2.Cookies", 0, 60);
6  text("3.Mac & Cheese", 0, 80);
```

Mouse Tracker:

```
1  fill(255, 0, 255);
2
3  draw = function() {
4      background(255, 255, 255);
5      ellipse(mouseX, mouseY, 12, 12);
6      var label = mouseX + " , " + mouseY;
7      text (label, mouseX+10 , mouseY+15);
8  };
9  |
```

Functions

Say your Name:

```
1
2  fill(255, 0, 0);
3  textSize(30);
4  var name = function() {
5  var textX = random(0, 300);
6  var textY = random(0, 300);
7  var yourName = "Master Yoda";
8  text("Hiiii, " + yourName, textX, textY);
9  };
10 name();
11 name();
12 name();
13 name();
```

Moles in Holes:

```
1
2  var drawMole = function(moleX,moleY) {
3      noStroke();
4      fill(125, 93, 43);
5      ellipse(moleX, moleY, 60, 60); // face
6      fill(255, 237, 209);
7      ellipse(moleX, moleY+10, 33, 28);
8      fill(0, 0, 0);
9      ellipse(moleX-10, moleY-15, 10, 10); // eyes
10     ellipse(moleX+10, moleY-15, 10, 10);
11     ellipse(moleX, moleY-5, 10, 10); // nose
12     ellipse(moleX, moleY+10, 20, 5); // mouth
13 };
14
15 background(52, 168, 83); // green grass
16 fill(0, 0, 0);
17 ellipse(200, 200, 100, 30); // holes!
18 ellipse(70, 119, 100, 30);
19 ellipse(300, 60, 100, 30);
20 ellipse(297, 350, 100, 30);
21 drawMole(200,200);
22 drawMole(70,119);
23 drawMole(300,60);
24 drawMole(297,350);
```

Calculator:

```
1
2  var add = function(num1, num2) {
3      return num1 + num2;
4  };
5  var subtract = function(num1, num2) {
6      return num1 - num2;
7  };
8  var multiply = function(num1, num2) {
9      return num1*num2;
10 };
11 var divide = function(num1, num2) {
12     return num1/num2;
13 };
14
15 fill(255, 0, 0);
16 text("15 + 3 is " + add(15, 3), 10, 20);
17 text("15 - 3 is " + subtract(15, 3), 10, 50);
18 text("15 * 3 is " + multiply(15, 3), 10, 80);
19 text("15 / 3 is " + divide(15, 3), 10, 110);
20
21 text("8 + 4 is " + add(8, 4), 10, 170);
22 text("8 - 4 is " + subtract(8, 4), 10, 200);
23 text("8 * 4 is " + multiply(8, 4), 10, 230);
24 text("8 / 4 is " + divide(8, 4), 10, 260);
```

Logic and If Statements

Bouncy Ball:

```
1   // position of the ball
2   var y = 0;
3   // how far the ball moves every time
4   var speed = 2;
5
6 ▾ draw = function() {
7       background(127, 204, 255);
8
9       fill(66, 66, 66);
10      ellipse(200, y, 50, 50);
11
12      // move the ball
13      y = y + speed;
14      if (y>375) {speed =-2;}
15      if (y<25) {speed =2;}
16  };
17
```

Your first painting app:

```
1 ▾ draw = function() {
2 ▾     if (mouseIsPressed){
3       noStroke();
4       fill(84, 240, 12);
5       ellipse(mouseX, mouseY, 20, 20);}
6   };
7
```

Number Analyzer:

```
1   var theNumber = 0;
2
3   fill(0, 0, 0);
4   textSize(30);
5   text("Analysis of: " + theNumber, 10, 36);
6
7   text("It's positive", 10, 90);
8   text("It's negative", 10, 140);
9   text("It's zero", 10, 190);
10
11  noFill();
12 ▾ if (theNumber > 0) {
13  rect(5, 60, 200, 40);
14  }
15 ▾ if (theNumber < 0) {
16  rect(5, 109, 200, 40);
17  }
18 ▾ if (theNumber === 0){
19  rect(5,159,200,40);
20  }
```

Your First Button:

```
1 ▾ draw = function() {
2       fill(0, 255, 68); // start color
3 ▾     if (mouseIsPressed && mouseY < 200) {
4       fill (255, 0, 0);
5       }
6       rect(0, 0, 400, 200);   // the button
7
8       // The button text
9       fill(0, 0, 0);
10      textSize(30);
11      text("Press me!", 145, 115);
12  };
13  |
```

Smarter Button:

```
1 ▾ draw = function() {
2       fill(0, 255, 68); // start color
3
4 ▾     if (mouseIsPressed && mouseX > 50 && mouseX < 300 && mouseY>150 && mouseY < 250) {
5       fill(33, 112, 52); // click color
6       }
7   rect(50, 150, 250, 100);   // the button
8
9       // The button text
10  fill(0, 0, 0);
11  textSize(30);
12  text("PRESS ME!", 93, 193);
13  };
```

Flashy Flash Card:

```
1 ▾ draw = function() {
2       background(165, 219, 162);
3       fill(255, 254, 222);
4       rect(20, 100, 364, 200);
5
6       fill(0, 0, 0);
7       textSize(20);
8 ▾     if (mouseIsPressed) {
9       text("JavaScript !!!!", 39, 200);
10      }
11 ▾    else{
12      text("What programming language is this?", 39, 200);
13      }
14  };
```

Looping

A loopy Ruler:

```
1   fill(17, 0, 255);
2
3   // a handy dandy ruler across the top
4   var x = 0;
5   while (x < 400) {
6     text(x, x, 10);
7     x +=50;
8   }
9   var y =0;
10  while (y<400) {
11    text(y,0,y);
12    y +=50;
13  }
```

A Loopy Landscape:

```
1   background(144, 240, 234);
2
3   // Draw the sun
4   noStroke();
5   fill(255, 140, 0);
6   ellipse(335, 66, 70, 70);
7
8   // Get images from library and remember in variables
9   var grass = getImage("cute/GrassBlock");
10  var tree = getImage("cute/TreeUgly");
11  var x = 0;
12  while (x < 400) {
13    // Draw the tree and grass once
14    image(grass, x, 270);
15    image(tree, x, 200);
16    x +=100;
17  }
```

Lined Paper:

```
1   background(255, 255, 247);
2   stroke(173, 222, 237);
3
4
5   for (var i=0; i < 20; i++) {
6       var lineY = 20 + (i * 20);
7       line(0, lineY, 400, lineY);
8   }
9   for (var j=0; j < 20; j++) {
10      var lineX = 20 + (j*20);
11      line(lineX,0,lineX,400);
12  }
```

Arrays

Favorite Fruits:

```
1   var fruit = ["apple","pear","Melon"];
2   fill(21, 0, 255);
3   text(fruit[0],10,20);
4   text(fruit[1],10,40);
5   text(fruit[2],10,60);
6   text("My top " + fruit.length + " favorite fruit",10,80);
7
```

Favorite Animals:

```
1   var fa = ["dog","cat","rat","Zak","Kayven","horse"];
2   var i=0;
3   while (i < fa.length) {
4     fill(255, 0, 0);
5     text (fa[i],i,i*15+20);
6       i++;
7
8   }
```

Constellation Maker:

```
1   var xPositions = [100,200];
2   var yPositions = [200,200];
3
4   var drawStars = function() {
5       background(9, 5, 59);
6       imageMode(CENTER);
7       for (var i = 0; i < yPositions.length; i++) {
8           image(getImage("space/star"), xPositions[i], yPositions[i], 30, 30);
9       }
10  };
11
12  drawStars();
13  mouseClicked = function (){
14      xPositions.push(mouseX);
15      yPositions.push(mouseY);
16      drawStars();
17  };
```

Objects

Recipe Card:

```javascript
1  var recipeTitle = "Pizza";
2  var recipeServings = 1;
3  var recipeIngredients = ["open box", "microware it"];
4
5  var food ={
6      title:"Pizza",
7      servings:1,
8      ingredients:["open box", "microware it"]
9  };
10
11 fill(26, 26, 26);
12 textSize(20);
13 text(food.title, 10, 23);
14 text("Serves: " + food.servings, 10, 55);
15 text("Ingredients: " + food.ingredients, 10, 85);
16 |
```

Picture Painter:

```javascript
1  var paintBrush = {
2      x: 100,
3      y: 100,
4      img: getImage("avatars/aqualine-sapling")
5  };
6
7  var paintCanvas = function() {
8      imageMode(CENTER);
9      image(paintBrush.img, paintBrush.x, paintBrush.y);
10 };
11 mouseMoved = function(){
12     paintBrush.x=mouseX;
13     paintBrush.y=mouseY;
14 paintCanvas();
15 };
```

Movie Reviews:

```javascript
1  var movies = [
2      {
3          title: "Puff the Magic Dragon",
4          review: "Best movie ever!!"
5      },
6      {
7          title: "Star Wars",
8          review: "Better movie!!"
9      }
10 ];
11 for (var i = 0; i < movies.length ;i++){
12 fill(84, 140, 209);
13 textAlign(CENTER, CENTER);
14 textSize(20);
15 text(movies[i].title, 200, 50*i + 50);
16 textSize(15);
17 text(movies[i].review, 200, 50*i + 70);
18 }
```

Object-orientated Design

Double Rainbow:

```javascript
var drawRainbow = function(rainbow) {
    noFill();
    strokeWeight(5);
    stroke(255, 0, 0);
    arc(rainbow.x, rainbow.y, rainbow.radius, rainbow.radius, 180, 360);
    stroke(250, 200, 0);
    arc(rainbow.x, rainbow.y, rainbow.radius-10, rainbow.radius-10, 180, 360);
    stroke(240, 255, 102);
    arc(rainbow.x, rainbow.y, rainbow.radius-20, rainbow.radius-20, 180, 360);
    stroke(29, 255, 13);
    arc(rainbow.x, rainbow.y, rainbow.radius-30, rainbow.radius-30, 180, 360);
    stroke(122, 155, 255);
    arc(rainbow.x, rainbow.y, rainbow.radius-40, rainbow.radius-40, 180, 360);
};
var Rainbow = function(x,y,radius){
    this.x = x;
    this.y = y;
    this.radius = radius;
};
var newrainbow1 = new Rainbow(100,100,100);
drawRainbow(newrainbow1);

var newrainbow2 = new Rainbow(100,200,100);
drawRainbow(newrainbow2);
```

Smiley face:

```javascript
var SmileyFace = function(centerX,centerY) {
    this.centerX = centerX;
    this.centerY = centerY;
};

SmileyFace.prototype.draw = function() {
    fill(168, 124, 70);
    ellipse(this.centerX, this.centerY, 150, 150);
    fill(0, 0, 0);
    ellipse(this.centerX-30, this.centerY-30, 20, 20);
    ellipse(this.centerX+30, this.centerY-30, 20, 20);
    noFill();
    strokeWeight(3);
    arc(this.centerX, this.centerY+10, 64, 40, 0, 180);
};

SmileyFace.prototype.speak = function(hello) {
    text(hello, this.centerX, this.centerY);
};

var faceObj = new SmileyFace(100,100);
var face = new SmileyFace(200,200);
faceObj.draw();
faceObj.speak("Hello");
face.draw();
face.speak("Good Bye");
```

Flower Grower:

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