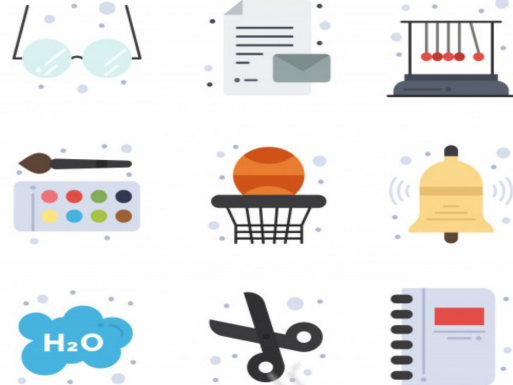


CLASSES AND OBJECTS



What is our GOAL for this MODULE?

We used our knowledge about blueprints to create many classes and objects. We also used mouse movement to make the bird object interact with other objects.

What did we ACHIEVE in the class TODAY?

- Designed different classes corresponding to the different game objects.
- Created objects using the above class blueprints.
- Made the bird object move with the mouse.

Which CONCEPTS/ CODING BLOCKS did we cover today?

- setAngle method
- Friction property

How did we DO the activities?

1. Increase the size of our canvas to 1200,400. The ground size will also increase.

```
const Engine = Matter.Engine;
const World= Matter.World;
const Bodies = Matter.Bodies;

var engine, world;
var box1, pig1;

function setup(){
  var canvas = createCanvas(1200,400);
  engine = Engine.create();
  world = engine.world;

  ground = new Ground(600,height,1200,20)

  box1 = new Box(200,300,50,50);
  box2 = new Box(240,100,50,100);
```

2. Change the value of box1 and box2 as the value of canvas changed.

```
const Bodies = Matter.Bodies;

var engine, world;
var box1, pig1;

function setup(){
  var canvas = createCanvas(1200,400);
  engine = Engine.create();
  world = engine.world;

  ground = new Ground(600,height,1200,20)

  box1 = new Box(700,320,70,70);
  box2 = new Box(920,320,70,70);
```

3. Create the Pig class. It will be similar to the Box class for now.

```

class Pig {
  constructor(x, y) {
    var options = {
      'restitution':0.8,
      'friction':0.3,
      'density':1.0
    }
    this.body = Bodies.rectangle(x, y, 50, 50, options);
    this.width = 50;
    this.height = 50;

    World.add(world, this.body);
  }
  display(){
    var pos =this.body.position;
    var angle = this.body.angle;
    push();
    translate(pos.x, pos.y);
    rotate(angle);
    rectMode(CENTER);

    fill("green");
    rect(0, 0, this.width, this.height);
    pop();
  }
};

```

```

index.html → ...
1  <!DOCTYPE html>
2  <html>
3  <head>
4    <script src="p5.min.js"></script>
5    <script src="p5.dom.min.js"></script>
6    <script src="p5.sound.min.js"></script>
7    <script src="matter.js"></script>
8    <script src="Ground.js"></script>
9    <script src="Box.js"></script>
10   <script src="Pig.js"></script>
11   <link rel="stylesheet" type="text/css" href="style.css">
12   <meta charset="utf-8">
13 </head>
14 <body>
15   <script src="sketch.js"></script>
16 </body>
17 </html>
18

```

```
const World= Matter.World;
const Bodies = Matter.Bodies;

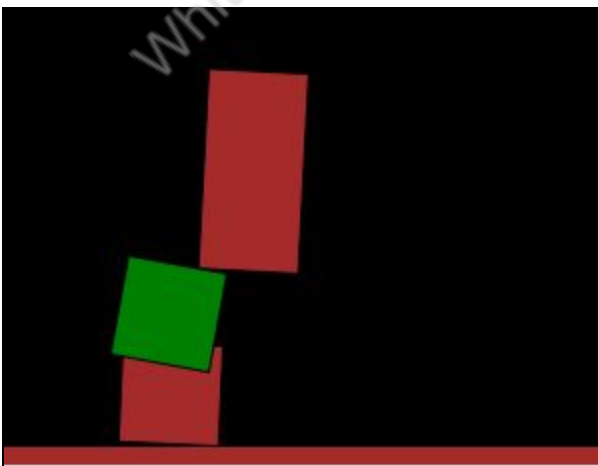
var engine, world;
var box1, pig1;

function setup(){
  var canvas = createCanvas(1200,400);
  engine = Engine.create();
  world = engine.world;

  ground = new Ground(600,height,1200,20)

  box1 = new Box(700,320,70,70);
  box2 = new Box(920,320,70,70);
  pig1 = new Pig(810, 350);
}

function draw(){
  background(0);
  Engine.update(engine);
  console.log(box2.body.position.x);
  console.log(box2.body.position.y);
  console.log(box2.body.angle);
  box1.display();
  box2.display();
  ground.display();
  pig1.display();
}
```



4. Write code for the log class to pass an angle parameter while creating the log object. The logs in the object also have a fixed width.

```
class Log {
  constructor(x, y, height, angle){
    //constructor(x, y,width, height) {
    var options = {
      'restitution':0.8,
      'friction':0.3,
      'density':1.0
    }
    this.body = Bodies.rectangle(x, y,20, height, options);
    this.width = 20;
    this.height = height;
    Matter.Body.setAngle(this.body, angle);
    World.add(world, this.body);
  }
  display(){
    var pos =this.body.position;
    var angle = this.body.angle;
    push();
    translate(pos.x, pos.y);
    rotate(angle);
    rectMode(CENTER);
    rect(0, 0, this.width, this.height);
    pop();
  }
};
```



```

const World= Matter.World;
const Bodies = Matter.Bodies;

var engine, world;
var box1, pig1;

function setup(){
  var canvas = createCanvas(1200,400);
  engine = Engine.create();
  world = engine.world;
  ground = new Ground(600,height,1200,20)

  box1 = new Box(700,320,70,70);
  box2 = new Box(920,320,70,70);
  pig1 = new Pig(810, 350);
  log1 = new Log(810,260,300, PI/2);
}

function draw(){
  background(0);
  Engine.update(engine);
  console.log(box2.body.position.x);
  console.log(box2.body.position.y);
  console.log(box2.body.angle);
  box1.display();
  box2.display();
  ground.display();
  pig1.display();
  log1.display();
}

```

```

index.html > html > head > script
1  <!DOCTYPE html>
2  <html>
3  <head>
4    <script src="p5.min.js"></script>
5    <script src="p5.dom.min.js"></script>
6    <script src="p5.sound.min.js"></script>
7    <script src="matter.js"></script>
8    <script src="Ground.js"></script>
9    <script src="Box.js"></script>
10   <script src="Pig.js"></script>
11   <script src="Log.js"></script>
12   <link rel="stylesheet" type="text/css" href="style.css">
13   <meta charset="utf-8">
14 </head>
15 <body>
16   <script src="sketch.js"></script>
17 </body>
18 </html>
19

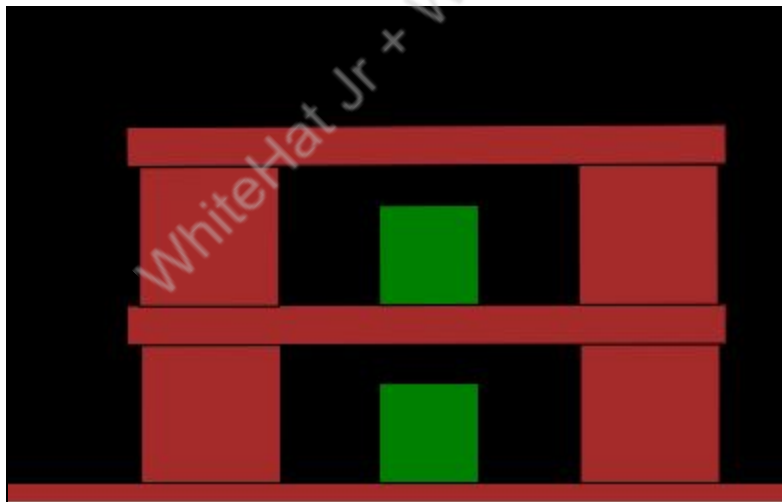
```



5. Create a second layer similar to the first layer.

```
13
14   ground = new Ground(600,height,1200,20)
15
16   box1 = new Box(700,320,70,70);
17   box2 = new Box(920,320,70,70);
18   pig1 = new Pig(810, 350);
19   log1 = new Log(810,260,300, PI/2);
20
21   box3 = new Box(700,240,70,70);
22   box4 = new Box(920,240,70,70);
23   pig3 = new Pig(810, 220);
24
25   log3 = new Log(810,180,300, PI/2);
26
27 }
28
29 function draw(){
30   background(0);
31   Engine.update(engine);
32   console.log(box2.body.position.x);
33   console.log(box2.body.position.y);
34   console.log(box2.body.angle);
35   box1.display();
36   box2.display();
37   ground.display();
38   pig1.display();
39   log1.display();
40
41   box3.display();
42   box4.display();
43   pig3.display();
44   log3.display();
45
46 }
```

```
13
14     ground = new Ground(600,height,1200,20)
15
16     box1 = new Box(700,320,70,70);
17     box2 = new Box(920,320,70,70);
18     pig1 = new Pig(810, 350);
19     log1 = new Log(810,260,300, PI/2);
20
21     box3 = new Box(700,240,70,70);
22     box4 = new Box(920,240,70,70);
23     pig3 = new Pig(810, 220);
24
25     log3 = new Log(810,180,300, PI/2);
26
27 }
28
29 function draw(){
30     background(0);
31     Engine.update(engine);
32     console.log(box2.body.position.x);
33     console.log(box2.body.position.y);
34     console.log(box2.body.angle);
35     box1.display();
36     box2.display();
37     ground.display();
38     pig1.display();
39     log1.display();
40
41     box3.display();
42     box4.display();
43     pig3.display();
44     log3.display();
45 }
46 }
```



6. Create the box on the top and two sloping logs to experiment with the angles for the logs.

```
js sketch.js draw
18
19   log1 = new Log(810,260,300, PI/2);
20
21   box3 = new Box(700,240,70,70);
22   box4 = new Box(920,240,70,70);
23   pig3 = new Pig(810, 220);
24
25   log3 = new Log(810,180,300, PI/2);
26
27   box5 = new Box(810,160,70,70);
28   log4 = new Log(760,120,150, PI/7);
29   log5 = new Log(870,120,150, -PI/7);
30
31 }
32
33 function draw(){
34   background(0);
35   Engine.update(engine);
36   console.log(box2.body.position.x);
37   console.log(box2.body.position.y);
38   console.log(box2.body.angle);
39   box1.display();
40   box2.display();
41   ground.display();
42   pig1.display();
43   log1.display();
44
45   box3.display();
46   box4.display();
47   pig3.display();
48   log3.display();
49
50   box5.display();
51   log4.display();
52   log5.display();
```

7. Increase friction to stop the sliding from happening. In the Log and Box class, add “friction = 1.0” in our options to prevent the sliding.

```
1 class Log {
2   constructor(x, y, height, angle) {
3     var options = {
4       'restitution':0.8,
5       'friction':1.0,
6       'density':1.0
7     }
8     this.body = Bodies.rectangle(x, y, 20, height, options);
9     this.width = 20;
10    this.height = height;
11    Matter.Body.setAngle(this.body, angle);
12    World.add(world, this.body);
13  }
14  display(){
15    var pos =this.body.position;
16    var angle = this.body.angle;
17    push();
18    translate(pos.x, pos.y);
19    rotate(angle);
20    rectMode(CENTER);
21    strokeWeight(4);
22    stroke("green");
23    fill(255);
24    rect(0, 0, this.width, this.height);
25    pop();
26  }
27 };
28
```

```
1 class Box {
2   constructor(x, y, width, height) {
3     var options = {
4       'restitution':0.8,
5       'friction':1.0,
6       'density':1.0
7     }
8     this.body = Bodies.rectangle(x, y, width, height, options);
9     this.width = width;
10    this.height = height;
11
12    World.add(world, this.body);
13  }
14  display(){
15    var pos =this.body.position;
16    var angle = this.body.angle;
17    push();
18    translate(pos.x, pos.y);
19    rotate(angle);
20    rectMode(CENTER);
21    strokeWeight(4);
22    stroke("green");
23    fill(255);
24    rect(0, 0, this.width, this.height);
25    pop();
26  }
27 };
28
```

8. Create a Bird Class similar to the pig class and make the bird class move with the Mouse.

```
class Bird {
  constructor(x, y) {
    var options = {
      'restitution':0.8,
      'friction':0.3,
      'density':1.0
    }
    this.body = Bodies.rectangle(x, y, 50, 50, options);
    this.width = 50;
    this.height = 50;
    World.add(world, this.body);
  };
  display(){
    var pos = this.body.position;
    pos.x = mouseX;
    pos.y = mouseY;
    var angle = this.body.angle;

    push();
    translate(pos.x, pos.y);
    rotate(angle);

    fill('red')
    rectMode(CENTER)
    rect(0, 0, this.width, this.height);
    pop();
  };
};
```

```
function draw(){
  background(0);
  Engine.update(engine);
  console.log(box2.body.position.x);
  console.log(box2.body.position.y);
  console.log(box2.body.angle);
  box1.display();
  box2.display();
  ground.display();
  pig1.display();
  log1.display();

  box3.display();
  box4.display();
  pig3.display();
  log3.display();

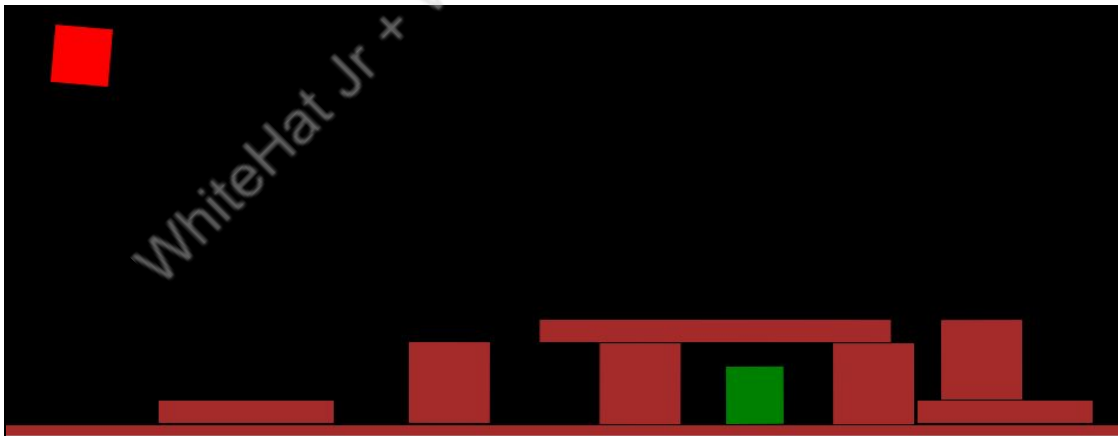
  box5.display();
  log4.display();
  log5.display();

  bird.display();
}
```

```
index.html ▶ html
1  <!DOCTYPE html>
2  <html>
3  <head>
4    <script src="p5.min.js"></script>
5    <script src="p5.dom.min.js"></script>
6    <script src="p5.sound.min.js"></script>
7    <script src="matter.js"></script>
8    <script src="Ground.js"></script>
9    <script src="Box.js"></script>
10   <script src="Pig.js"></script>
11   <script src="Log.js"></script>
12   <script src="Bird.js"></script>
13   <link rel="stylesheet" type="text/css" href="style.css">
14   <meta charset="utf-8">
15 </head>
16 <body>
17   <script src="sketch.js"></script>
18 </body>
19 </html>
20
```



9. Beat the pigs by moving your Mouse.



What's next?

We will add images to our Angry Birds game!

Extend your knowledge:

1. See the following link to learn more about classes:
https://www.w3schools.com/js/js_object_classes.asp
2. See the following link to learn about javascript objects:
https://www.w3schools.com/js/js_object_definition.asp

WhiteHat Jr + WhiteHat Jr + WhiteHat Jr