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PLINKO GAME

WhiteHat Jr
Live Online Coding for Kids

INSTRUCTIONS:

Goal of the Project:

In Class 31, you have learnt the concept of arrays.

In this project, you will have to practice and apply what you have learnt in the class and develop the Plinko Game.

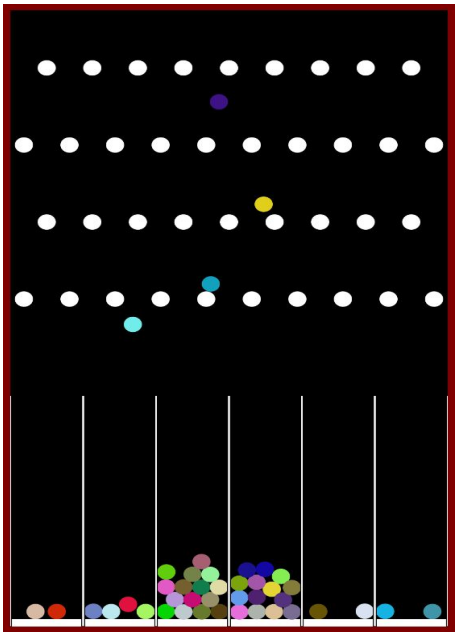
Story:

Honey has seen the plinko game played by various contestants on the TV.

Plinko is a game played on a nearly vertical board populated with offset rows of pegs. The player chooses one of five slots in the top of the board, drops the chip into it and watches as the chip bounces down the board. Each time the chip encounters a peg, it will either bounce left or right.

Now Honey wants to make this game for herself so she can play anytime.

See a video of this in action here.



***This is just for your reference. We expect you to apply your own creativity in the project.**

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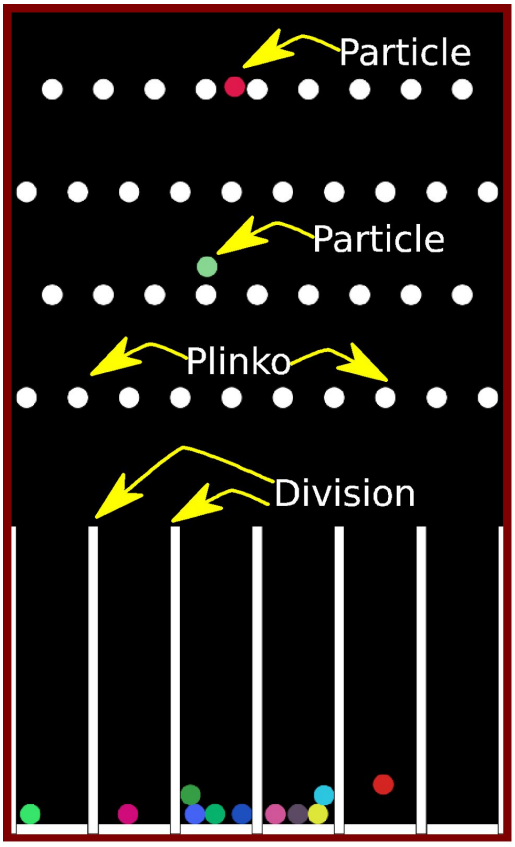
Getting Started:

1. Use the blank template on GitHub, available for download here.
2. **Unzip** this folder.
3. Rename the unzipped folder as **Project 31.**
4. **Import** this folder **into VS Code**.
5. Start editing your code in **sketch.js**.

Specific Tasks to complete the Project:

1. Start with a square canvas of 480 width and 800 pixels height.
2. You will need the following four types of objects in this project:

Particles: Particles are round matter.js bodies which fall from the top of the canvas. The colorful circles are the balls which are falling due to gravity.	
Plinko: Plinko is a static body, which is circular and is placed in the path of the falling ball, such that the ball bounces off the plinko. The rows of white circles are the plinkos.	
Divisions: These are the vertical static sections, in which the particles accumulate after they fall through the plinkos.	
Ground: The static body which prevents the balls from falling out of the canvas.	

3. Create the following classes to start coding this game.
    - **Ground.js**
        - Ground.js can be reused from your Angry Birds game with appropriate modifications to suit the Plinko project.
        - Add this file to index.html
        - Make a single ground body at the bottom of the canvas.

- **Division.js**
    - Add this file to index.html.
    - This is similar to the Ground.js class, but it should be taller than it is wider.

```
class Divisions {
    constructor(x, y, w, h) {
        var options = {

            isStatic: true
        }
        this.body = Bodies.rectangle(x, y, w, h, options);
        this.w = w;
        this.h = h;
        World.add(world, this.body);
    }
    display() {
        var pos = this.body.position;
        rectMode(CENTER);
        fill("white");
        rect(pos.x, pos.y, this.w, this.h);
    }
};
```

- **Plinko.js**
    - Create a Plinko class with every Plinko being a circular body of radius 10.

- **Particle.js**
    - Add a color property for the particle in the constructor.
    - Use this color property in the display() method.

```
this.body = Bodies.circle(x, y, this.r,options);
this.color=color(random(0, 255), random(0, 255), random(0, 255));
World.add(world, this.body);
```

4. Create three Arrays as shown below, outside of setup() function.

```
var particles = [];
var plinkos = [];
var divisions =[];
```

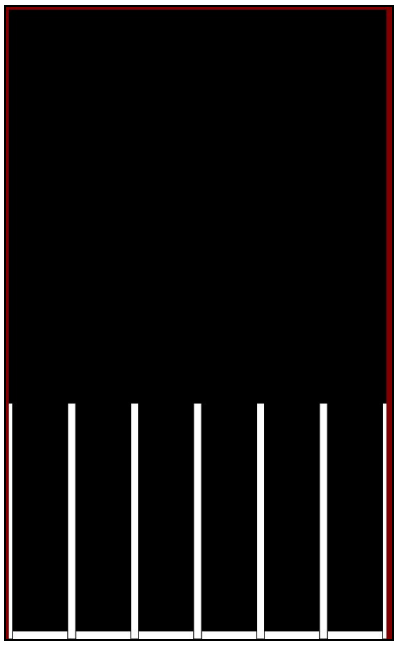
5. Create a variable **divisionHeight** in sketch.js, outside the setup function.

```
var divisionHeight=300;
```

6. Create multiple divisions using a for loop at the bottom of the screen as shown.

```
for (var k = 0; k <=width; k = k + 80) {
  divisions.push(new Divisions(k, height-divisionHeight/2, 10, divisionHeight));
}
```

- Distance between consecutive divisions is 80 pixels.
- You can fit 6 “buckets” in which the balls will be caught, using 8 divisions.



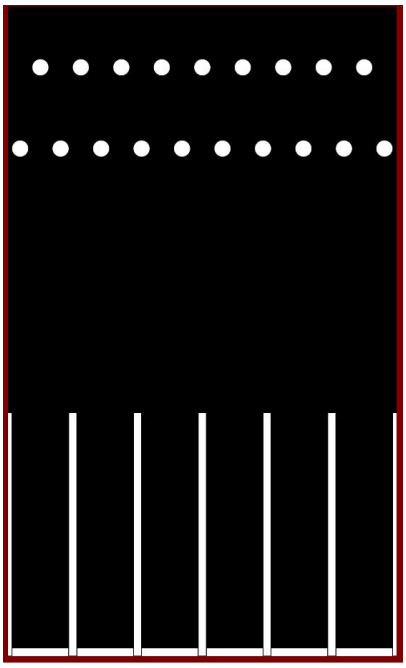
7. See the image below on how to add a Plinko to the plinkos array.
    - Two rows of plinkos are shown here, you would need to create two more rows.

```
for (var j = 40; j <=width; j=j+50)
{

   plinkos.push(new Plinko(j,75));
}

for (var j = 15; j <=width-10; j=j+50)
{

   plinkos.push(new Plinko(j,175));
}
```



8. Make sure we are creating a new particle after every 90 frames. (See hints)
9. Create an object for the ground and display it.
10. Using the for loop, display the plinko, particles and divisions. (Similar loop for all but the array name should be changed).

```
for (var j = 0; j < particles.length; j++) {

  particles[j].display();
}
for (var k = 0; k < divisions.length; k++) {

  divisions[k].display();
}
```

11. Make sure the project works before you submit the project.

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Submitting the Project:

1. Upload your completed project to your own GitHub account.
2. Create a New Repository named “**Project 31**”.
3. **Upload** working code to this GitHub repository.
4. Enable GitHub pages for your repository.
5. Copy the link to the GitHub pages link in the Student Dashboard.

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Hints :

1. Create Particles on every 60th frame.
    - The X position of the particle is such that it falls a random distance away from the center.
    - The radius of the plinko pegs and the particles are equal.

```
if(frameCount%60===0){
  particles.push(new Particle(random(width/2-10, width/2+10), 10,10));

}
```

2. Code for the Particle Class:

```
class Particle {
    constructor(x, y,r) {

        var options ={
            restitution:0.4
        }
        this.r=r;

        this.body = Bodies.circle(x, y, this.r,options);
        this.color=color(random(0, 255), random(0, 255), random(0, 255));
        World.add(world, this.body);

    }
    display() {

        var pos = this.body.position;
        var angle = this.body.angle;

        push();
        translate(pos.x, pos.y);
        rotate(angle);
        //imageMode(CENTER);
        noStroke();
        fill(this.color)
        ellipseMode(RADIUS);
        ellipse(0, 0, this.r,this.r);
        pop();
    }

};
```

3. Here are reference links for push and pop documentation:
    - reference | pop()
    - reference | push()

4. Here are some examples of how to work with arrays in P5: examples

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REMEMBER... Try your best, that's more important than being correct.
After submitting your project your teacher will send you feedback on your work.

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