PLTW 1.1.9 Project Template

Algorithms and Art Project

PLTW 1.1.9

<u>Team Names</u> .

Date: 9/8/2021	Date:	Date:	Date:	Date
Tommaso	1.9/23	1.9/26	1.9/27	1.9/29
Ricardo	2.9/23	2.9/26	2.9/27	2.9/29

1. Describe the development process
   Investigate an idea, plan, design, create, test, evaluate the solution, document, and present.

2. List the Requirements
- Create a variety of shapes to produce a unique, artistic artifact.
- Use color and size variations to enhance your artwork.
- Use movement to enhance your artifact.
- Use iteration (looping) and conditional execution (if statements) to control the drawing.

To help you in creating your artwork:
- Use existing turtle methods.
- Choose descriptive variable names.
- Comment code segments or blocks of statements.

3. Brainstorm and list some ideas
   - We will create a scene in which a person will walk to an object, touch it, causing it to change color, and run back to its starting place at the same time that the object explodes and disappears.
   -We will create a scene in which a snowman will explode, get sent into space, and land on Mars..

4. What are your milestones / incremental process?
   Day 1: Build Trees ,Snowman, and background
   Day 2: Explode snowman and send him into space
   Day 3: Snowman lands on Mars

5. What are your prototypes?

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1. Project Idea

Snowman Explosion:

We will create a scene in which a snowman will explode, get sent into space, and land on Mars..

2. Project Design

[Insert Here]

Student one: Ricardo

 Space + Mars

       Created snowman procedure
       Created hill procedure
       Created cloud procedure

Student two: Tommaso

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Earth + Stars

           Created moving object coming out of cloud procedure

           Created tree procedure

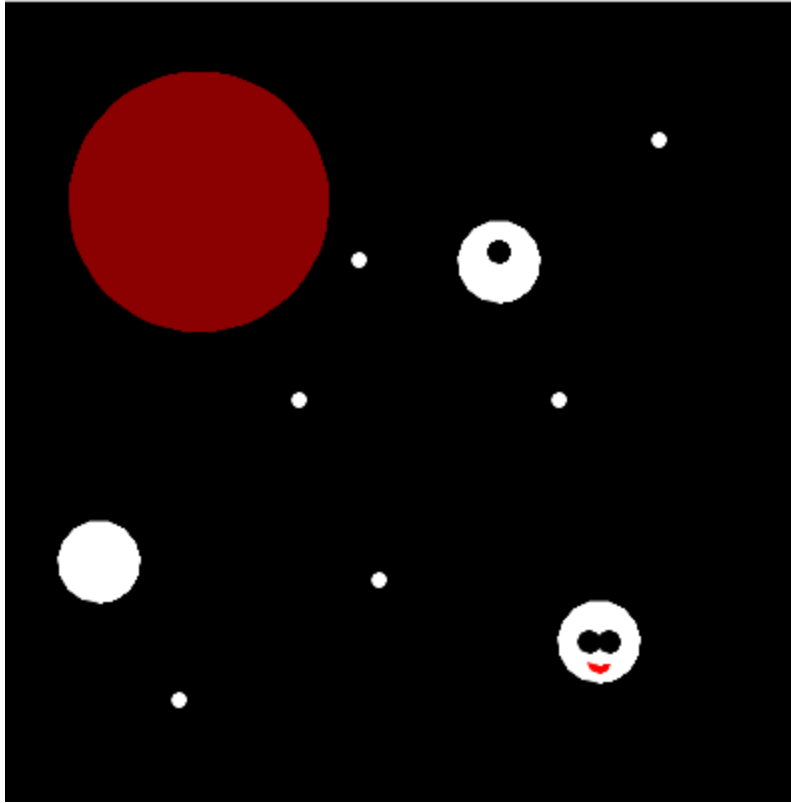   Created explosion + stars in space

3. Project Code

Bottom of page…

4. Image of Project Results

[Insert Here]

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Team member Contributions

1. Tommaso - Helped organize beginning scene
2. Ricardo - Helped organize ending scenes
3. Tommaso - Helped organize code for specific shapes
4. Ricardo - Helped organize backgrounds

```
import turtle
import math
import time


# Function to draw rectangle
def drawRectangle(t, width, height, color):
    t.fillcolor(color)
    t.begin_fill()
    t.forward(width)
```

```python
    t.left(90)
    t.forward(height)
    t.left(90)
    t.forward(width)
    t.left(90)
    t.forward(height)
    t.left(90)
    t.end_fill()


# Function to draw triangle
def drawTriangle(t, length, color):
    t.fillcolor(color)
    t.begin_fill()
    t.forward(length)
    t.left(135)
    t.forward(length / math.sqrt(2))
    t.left(90)
    t.forward(length / math.sqrt(2))
    t.left(135)
    t.end_fill()


# Set the background color
screen = turtle.Screen ( )
screen.bgcolor("skyblue")


# Creating turtle object
tip = turtle.Turtle()
tip.color ("black")
tip.shape ("arrow")
tip.speed (0)

# Make grass floor
turtle.speed(0)
# Make floor
turtle.speed(0)
turtle.penup()
turtle.goto(-400, -150)
turtle.pendown()
turtle.color("#7CFC00")
turtle.begin_fill()
```

```
for i in range(2):
    turtle.forward(800)
    turtle.right(90)
    turtle.forward(400)
    turtle.right(90)
turtle.end_fill()

# Create hill that snowman is on
turtle.penup()
turtle.goto(100, -150)
turtle.pendown()
turtle.fillcolor("#7CFC00")
turtle.begin_fill()
turtle.circle(30)
turtle.end_fill()

turtle.penup()
turtle.goto(160, -150)
turtle.pendown()
turtle.fillcolor("#7CFC00")
turtle.begin_fill()
turtle.circle(40)
turtle.end_fill()

turtle.penup()
turtle.goto(130, -150)
turtle.pendown()
turtle.fillcolor("#7CFC00")
turtle.begin_fill()
turtle.circle(35)
turtle.end_fill()

turtle.penup()
turtle.goto(75, -150)
turtle.pendown()
turtle.fillcolor("#7CFC00")
turtle.begin_fill()
turtle.circle(25)
turtle.end_fill()

turtle.penup()
turtle.goto(55, -150)
turtle.pendown()
```

```
turtle.fillcolor("#7CFC00")
turtle.begin_fill()
turtle.circle(20)
turtle.end_fill()

turtle.penup()
turtle.goto(180, -150)
turtle.pendown()
turtle.fillcolor("#7CFC00")
turtle.begin_fill()
turtle.circle(45)
turtle.end_fill()

turtle.penup()
turtle.goto(140, -200)
turtle.pendown()
turtle.fillcolor("#7CFC00")
turtle.begin_fill()
turtle.circle(60)
turtle.end_fill()

turtle.penup()
turtle.goto(90, -170)
turtle.pendown()
turtle.fillcolor("#7CFC00")
turtle.begin_fill()
turtle.circle(35)
turtle.end_fill()

turtle.penup()
turtle.goto(40, -190)
turtle.pendown()
turtle.fillcolor("#7CFC00")
turtle.begin_fill()
turtle.circle(35)
turtle.end_fill()


# Tree base
turtle.speed(0)
tip.penup()
tip.goto(-130,-150)
```

```
tip.pendown()
drawRectangle(tip, 20, 40, "#964B00")


# Tree top
tip.penup()
tip.goto(-165, -120)
tip.pendown()
drawTriangle(tip, 90, "green")
tip.penup()
tip.goto(-155,-100)
tip.pendown()
drawTriangle(tip, 70, "green")

# tree trunk
tip.penup()
tip.goto(-20,-150)
tip.pendown()
drawRectangle(tip, 20, 40, "#964B00")

# tree top
tip.penup()
tip.goto(-55,-120)
tip.pendown()
drawTriangle(tip, 90, "green")
tip.penup()
tip.goto(-45,-100)
tip.pendown()
drawTriangle(tip, 70, "green")

turtle.penup()
turtle.goto(100,-150)
turtle.pendown()
turtle.circle(28)


# Bottom of body
tip.penup()
tip.goto(100,-100)
tip.pendown()
tip.color("white")
tip.begin_fill()
tip.circle(20)
```

```python
tip.end_fill()

# Middle of body
tip.penup()
tip.goto(100,-70)
tip.pendown()
tip.begin_fill()
tip.circle(20)
tip.end_fill()

# Head of Snowman
tip.penup()
tip.goto(100,-40)
tip.pendown()
tip.begin_fill()
tip.circle(20)
tip.end_fill()

# Function to draw 1 small black circle
def black_circle():
    tip.color("black")
    tip.begin_fill()
    tip.circle(5)
    tip.end_fill()


# Mouth
tip.penup()
tip.goto(100,-35)
tip.pendown()
tip.color("red")
tip.begin_fill()
tip.circle(5)
tip.end_fill()

tip.penup()
tip.goto(100,-31)
tip.pendown()
tip.color("white")
tip.begin_fill()
tip.circle(15)
tip.end_fill()
```

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```
# Eyes
x = 0
for i in range(1):
    tip.penup()
    tip.goto(105,-25)
    tip.pendown()
    black_circle()
    x = x + 50
x = 0
for i in range(1):
    tip.penup()
    tip.goto(95,-25)
    tip.pendown()
    black_circle()
    x = x + 50

# Buttons
y = 0
for i in range(4):
    tip.penup()
    tip.goto(100,-50)
    tip.pendown()
    black_circle()
    y = y - 10

y = 0
for i in range(4):
    tip.penup()
    tip.goto(100,-70)
    tip.pendown()
    black_circle()
    y = y - 10

y = 0
for i in range(4):
    tip.penup()
    tip.goto(100,-90)
    tip.pendown()
    black_circle()
    y = y - 10
tip.hideturtle()
```

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```python
# create dark cloud

def filled_circle(radius, color):
    turtle.color(color,color)
    turtle.begin_fill()
    turtle.circle(radius)
    turtle.end_fill()

turtle.penup()
turtle.goto(-140,100)
turtle.pendown()
def cloud(radius, cloud_color="white"):
    filled_circle(radius,cloud_color)
    turtle.forward(radius)
    filled_circle(radius,cloud_color)
    turtle.right(90)
    filled_circle(radius,cloud_color)
    turtle.right(90)
    filled_circle(radius,cloud_color)
    turtle.right(90)
    filled_circle(radius,cloud_color)
    turtle.right(90)

radius = 50

cloud(radius)




turtle.penup()
turtle.goto(-90,100)
turtle.pendown()
turtle.shape("circle")

turtle.speed(1)
turtle.penup()
turtle.goto(100,-60)
turtle.pendown()

# explode snowman
turtle.pensize(90)
turtle.speed(0)
turtle.pencolor("red")
```

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```python
turtle.circle(45)
turtle.hideturtle()
tip.clear()
turtle.clear()

# snowman floating
time.sleep(1)
turtle.hideturtle()
screen.bgcolor("black")

# make sun
turtle.speed(0)
turtle.penup()
turtle.goto(-100, 80)
turtle.pencolor("#8B0000")
turtle.pendown()
turtle.begin_fill()
turtle.circle(20)
turtle.end_fill()

# create stars

turtle.penup()
turtle.goto(-50,0)
turtle.pencolor("white")
turtle.pendown()
turtle.pensize(5)
turtle.circle(1)
turtle.end_fill()
# star 2
turtle.penup()
turtle.goto(-110,-150)
turtle.pencolor("white")
turtle.pendown()
turtle.pensize(5)
turtle.circle(1)
turtle.end_fill()
# star 3
turtle.penup()
turtle.goto(130,130)
turtle.pencolor("white")
turtle.pendown()
turtle.pensize(5)
```

```
turtle.circle(1)
turtle.end_fill()
# star 4
turtle.penup()
turtle.goto(-20,70)
turtle.pencolor("white")
turtle.pendown()
turtle.pensize(5)
turtle.circle(1)
turtle.end_fill()
# star 5
turtle.penup()
turtle.goto(-10,-90)
turtle.pencolor("white")
turtle.pendown()
turtle.pensize(5)
turtle.circle(1)
turtle.end_fill()
# star 6
turtle.penup()
turtle.goto(80,0)
turtle.pencolor("white")
turtle.pendown()
turtle.pensize(5)
turtle.circle(1)
turtle.end_fill()
# Bottom of body
tip.penup()
tip.goto(-150,-100)
tip.pendown()
tip.color("white")
tip.begin_fill()
tip.circle(20)
tip.end_fill()

# Middle of body
tip.penup()
tip.goto(50,50)
tip.pendown()
tip.begin_fill()
tip.circle(20)
tip.end_fill()
```

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```
# Head of Snowman
tip.penup()
tip.goto(100,-140)
tip.pendown()
tip.begin_fill()
tip.circle(20)
tip.end_fill()

# Function to draw 1 small black circle
def black_circle():
    tip.color("black")
    tip.begin_fill()
    tip.circle(5)
    tip.end_fill()


# Mouth
tip.penup()
tip.goto(100,-135)
tip.pendown()
tip.color("red")
tip.begin_fill()
tip.circle(5)
tip.end_fill()

tip.penup()
tip.goto(100,-131)
tip.pendown()
tip.color("white")
tip.begin_fill()
tip.circle(15)
tip.end_fill()


# Eyes
x = 0
for i in range(1):
    tip.penup()
    tip.goto(105,-125)
    tip.pendown()
    black_circle()
    x = x + 50
x = 0
```

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```python
for i in range(1):
    tip.penup()
    tip.goto(95,-125)
    tip.pendown()
    black_circle()
    x = x + 50

# Buttons
y = 0
for i in range(4):
    tip.penup()
    tip.goto(50,70)
    tip.pendown()
    black_circle()
    y = y - 10

y = 0
for i in range(4):
    tip.penup()
    tip.goto(50,50)
    tip.pendown()
    black_circle()
    y = y - 10

y = 0
for i in range(4):
    tip.penup()
    tip.goto(-150,-90)
    tip.pendown()
    black_circle()
    y = y - 10
tip.hideturtle()

# snowman on Mars
time.sleep(1)
turtle.clear()
tip.clear()
time.sleep(1)
screen.bgcolor("darkred")

# Bottom of body
tip.penup()
tip.goto(0,-60)
```

```
tip.pendown()
tip.color("white")
tip.begin_fill()
tip.circle(20)
tip.end_fill()

# Middle of body
tip.penup()
tip.goto(0,-90)
tip.pendown()
tip.begin_fill()
tip.circle(20)
tip.end_fill()

# Head of Snowman
tip.penup()
tip.goto(0,-120)
tip.pendown()
tip.begin_fill()
tip.circle(20)
tip.end_fill()

# Function to draw 1 small black circle
def black_circle():
    tip.color("black")
    tip.begin_fill()
    tip.circle(5)
    tip.end_fill()


# Mouth
tip.penup()
tip.goto(0,-55)
tip.pendown()
tip.color("red")
tip.begin_fill()
tip.circle(5)
tip.end_fill()

tip.penup()
tip.goto(0,-51)
tip.pendown()
tip.color("white")
```

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```
tip.begin_fill()
tip.circle(15)
tip.end_fill()


# Eyes
x = 0
for i in range(1):
    tip.penup()
    tip.goto(5,-45)
    tip.pendown()
    black_circle()
    x = x + 50
x = 0
for i in range(1):
    tip.penup()
    tip.goto(-5,-45)
    tip.pendown()
    black_circle()
    x = x + 50

# Buttons
y = 0
for i in range(4):
    tip.penup()
    tip.goto(0,-70)
    tip.pendown()
    black_circle()
    y = y - 10

y = 0
for i in range(4):
    tip.penup()
    tip.goto(0,-90)
    tip.pendown()
    black_circle()
    y = y - 10

y = 0
for i in range(4):
    tip.penup()
    tip.goto(0,-110)
    tip.pendown()
```

```
    black_circle()
    y = y - 10
tip.hideturtle()

# text
turtle.color("black")
style = ("Arial", 11, "italic")
turtle.write("Why am I on Mars?! Oh no, I'm melting!", font=style, align="right")
time.sleep(2)
tip.clear()
turtle.clear()
turtle.hideturtle()
```