**OOPDraw  
Learn the principles of OOP by writing a simple drawing program**

TEACHER’S GUIDE

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This Teacher Guide is to be used in conjunction with the Student Workbook of the same title.

## What this resource helps to teach

## How to use this resource

# Complete code after Exercise 1

using Nakov.TurtleGraphics;

using System;

using System.Drawing;

namespace OOPDraw

{

public class MyDrawing

{

public static void Draw()

{

Square(0,0,Color.Blue, 100);

Square(100, 0, Color.Red, 50);

Circle(125, -10, Color.Black, 10);

Circle(25, -10, Color.Black, 10);

}

private static void Square(float positionX, float positionY, Color color, float sideLength)

{

Turtle.X = positionX;

Turtle.Y = positionY;

Turtle.PenColor = color;

for (int i = 0; i < 4; i++)

{

Turtle.Forward(sideLength);

Turtle.Rotate(90);

}

}

private static void Circle(float positionX, float positionY, Color color, float radius)

{

Turtle.X = positionX;

Turtle.Y = positionY;

Turtle.PenColor = color;

for (int i = 0; i < 360; i++)

{

Turtle.Forward((float) (2 \* Math.PI \* radius /360));

Turtle.Rotate(1);

}

}

}

}

# Square

using Nakov.TurtleGraphics;

using System.Drawing;

namespace OOPDraw

{

public class Square

{

public float PositionX { get; set; }

public float PositionY { get; set; }

public Color LineColor { get; set; }

public float SideLength { get; set; }

public Square(float x, float y, Color lineColor, float sideLength)

{

LineColor = lineColor;

PositionX = x;

PositionY = y;

SideLength = sideLength;

}

public void Draw()

{

Turtle.PenColor = LineColor;

Turtle.X = PositionX;

Turtle.Y = PositionY;

for (int i = 0; i < 4; i++)

{

Turtle.Forward(SideLength);

Turtle.Rotate(90);

}

}

}

}

# Circle

using Nakov.TurtleGraphics;

using System;

using System.Drawing;

namespace OOPDraw

{

public class Circle

{

public float PositionX { get; set; }

public float PositionY { get; set; }

public Color LineColor { get; set; }

public float Radius { get; set; }

public Circle(float x, float y, float radius, Color lineColor)

{

LineColor = lineColor;

PositionX = x;

PositionY = y;

Radius = radius;

}

public void Draw()

{

Turtle.PenColor = LineColor;

Turtle.X = PositionX;

Turtle.Y = PositionY;

for (int i = 0; i < 360; i++)

{

Turtle.Forward((float) Math.PI \* 2 \* Radius / 360);

Turtle.Rotate(1);

}

}

}

}

# Shape

using System;

using System.Collections.Generic;

using System.Drawing;

using System.Linq;

using System.Text;

namespace DrawingObjects

{

public abstract class Shape

{

public float PositionX { get; set; }

public float PositionY { get; set; }

public Color LineColor { get; set; }

public abstract void Draw();

public void MoveTo(float newX, float newY)

{

PositionX = newX;

PositionY = newY;

}

public abstract void GrowBy(float percent);

}

}