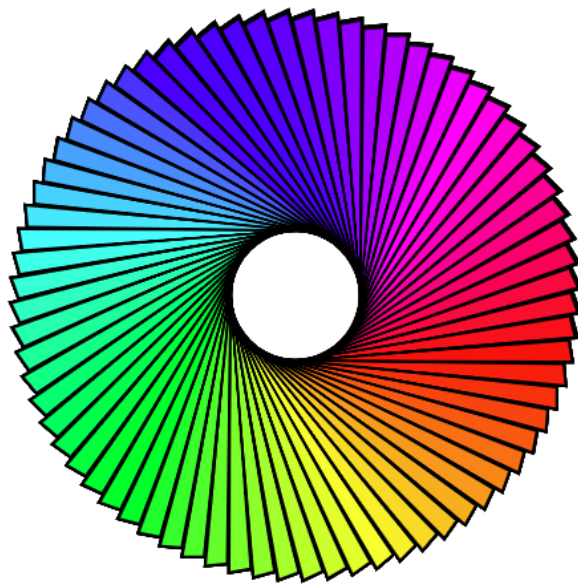


USD STEAM Academy

# HSVA\_Color Lesson



An Introduction to MathArt Creator  
by  
Paul G. Phillips  
Speaker, Artist, Programmer

# WELCOME

Your presenter is  
Paul Phillips



My Son and I created MathArt so you can make art patterns using math transformations and simple shapes.

To be ready for the lesson:

1. Click the link in your Chat Window.  
<https://www.mathart.us/Lesson2020/index.html>
2. Shrink the size of the browser to include the Instruction window. So it looks like my shared screen.
3. Figure how to switch between your browser and Zoom window.

# Setup Demonstration

## Demonstration.

1. Show/Hide ArtData button.
2. Triple Click on Data line.
3. Quick Navigate to Help/Reset.
4. Click the Reset button.
5. Quick Navigate to ArtObjects.
6. Click the Paste Art Data.
7. Paste in the empty field.
8. Click OK.

## Setup for Lesson

### ArtData:

```
1_200_100000_360_5_1.5_0_0_0_0_5_100_100_1_0_5_0_#p  
olyShape_false_false_false_false_false_false_false_false_  
false_false_false
```

### Copy This ArtData String

1. Paste in using the **Paste ArtData** button

### SVG Object

```
<polygon_ngcontent-c1="" points="-212.5,310  
260.83331298828125,303.33331298828125  
255,266.66668701171875 "></polygon>
```

### Copy This SVG Code String

1. Paste in using the **Paste SVG Object** button.

# Introduction HSVA

One of the ways to numerically represent color in a computer uses 4 parameters:

**Hue** divides the spectrum into 360.

**Saturation**

**Value**

**Alpha**

Activity: go to [MathArt Creator Tab](#)

1. Scroll the controls
2. Try the Quick Navigation buttons

You have 2 min to:

1. Go to the [MathArt Creator Tab](#).
2. Do the Activity.
3. Come back to Zoom.

# Human Interface Devices (Tool Types)

The human interface is the way you make [MathArtCreator](#) do something .

The tools types include the:

- checkbox,
- slider,
- input field,
- spinner,
- button,
- clickable shape name,
- radio button,
- input window,

[Demonstration](#) : Show an overview of tools.

[Demonstration](#) : Show the Primitives area and examples.

# MathArt Transformations

To **Transform** means to change.

In Mathematics to perform a math transformation, you use an equation. Behind each **Slider** is an equation that converts the action of the slider to an action on the stage.

Demonstration : Show

1. Scrolling the controls.
2. Using the Sliders.
3. Using checkboxes.

## Saving Patterns

Demonstration : Show

1. artcontrol button.
2. Download Art button process.

Download Art

Activity: go to [MathArtCreator](#)

1. Try the Sliders
2. Try the Random Checkboxes
3. Try the Primitives
4. Click the Download Art Button

You have 10 min to:

1. Go to the [MathArt Creator](#) Tab.
2. Do the Activity.
3. Come back to Zoom.

**If you get stuck.**

**If the screen goes black**

**Use Quick Navigation Area**

**Use the Help/Reset button**

**Then Use Reset button and START OVER**

# MathArt Basic Primitives

A **Primitive** is a shape stacked into layers making an array.

Basic Shapes include:

Circle  
Moon  
Ellipse  
Hexagon  
Leaves  
Octagon  
Pentagon  
Square  
Stick  
Triangle  
Heart  
File  
NewShape  
Petal

## Special Primitive: PolyShape

[Demonstration](#) : Show

1. Picking points to make a polyshape.

## Combine Primitives in containers

[Demonstration](#) : Show

1. Adding primitives to the Basement container.
2. Using the Kitchen as backup.

Activity: go to [Primitives](#)

1. Make a combined primitive pattern.
2. Save it using Download Art Button.

You have 5 min to:

1. Go to the [MathArt Creator](#) Tab.
2. Do the Activity.
3. Come back to Zoom.

# Modify Primitives With the Toolbox

Toolbox tools work in two ways:

1. Checkbox empty means the Action is on the primitive.
2. Checkbox checked means the Action is on a copy of the primitive.

*Tools*

Duplicate

*Tools*

Duplicate

## Demonstration : Show

1. Set Layers to 1
2. Set ArrayBar to 1
3. Set Spread to 0
4. Moving Stick to center 20H -180HV
5. Duplicate Stick - Rotate 60 – 6 times
6. Set Layers to 60
7. Set Spread to 100
8. Set ArrayBar to 3
9. Set Scale to 3
10. Download Art

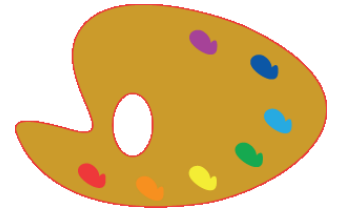
Activity: go to [tools](#)

1. Make a new primitive using the toolbox and containers.
2. Add layers, spread, Arrays, sliders
3. Save it using Download Art Button.

You have 5 min



# Create A Custom Color Palette



- A **PALETTE** is a collection of colors used in a work of art.

Demonstration : Show how to create custom colors for your art.

1. Click [PALETTE](#)
2. Move Slider to Red
3. Pick Shade
4. Add Color button
5. Move Slider to Violet
6. Pick Shade
7. Add Color button
8. Move Slider to Magenta
9. Pick light Shade
10. Add Color button

You have 5 min

Activity: go to [PALETTE](#)

1. Change the colors of your design.
2. If you do not like it click **NEW PALETTE**
3. Move Slider to your color
4. Pick Shade
5. Add Color button.
6. Save it using Download Art Button.
7. Click the Reset button

# Saving Your Artwork

## Saving Art Images

Demonstration : go to Art Controls

1. Sending each image to yourself and to [mathart@artbycoloring.com](mailto:mathart@artbycoloring.com)

Activity: go to Art Controls

1. Scroll Down to each of your saved images.
2. Right Click.
3. Select Copy image
4. Go to your email
5. Paste image into the email message
6. Put your name in the subject line.
7. Send each image to [mathart@artbycoloring.com](mailto:mathart@artbycoloring.com)
8. PC uses send an email to yourself
9. Mac uses open notes and save image there.
10. Send each image in a separate email.

You have 5 min

# Conclusion

Developing [MathArtCreator](#) required STEAM

**S**cience - Color Systems

**T**echnology - Computer Operations

**E**ngineering – Programming JavaScript, SVG, and HTML5

**A**rt – Shape and Pattern Design

**M**ath – Algebra, Geometry, Trigonometry to make equations for Transformation of Scale, Rotation, Skewing, Calculating Horizontal and Vertical Distance and more.

## Homework

- [Explore the MathArtCreator Operations Help File](#)
- [Explore the Advanced Challenges](#)
- [Explore the \*Quick Navigation Links\* not demonstrated](#)