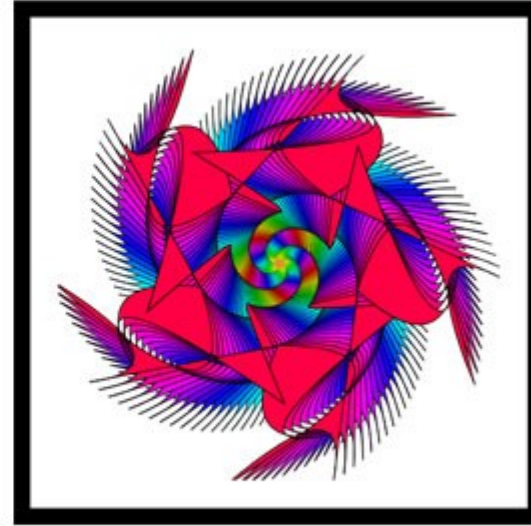


# MathArt Basement



## STEAM 2022 Lesson

By Paul Gary Phillips  
Mathart.us

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# Introduction

I Program for myself. I program to create a tool that makes my kind of art. It takes a single simple or compound shape and allows me to change the math transformation values the make the patterns.

Most of my programming is intuitive I use buttons, sliders, input boxes, and checkboxes. As I added tool areas over the past 5 years I made a Quick Navigation area to quickly jump to the set of tools I wanted.

I save what I like. Either by saving the slider data (ArtData) and the complex shapes created in the Basement.

Some of the way I have set to do things that are not so obvious. This document should help you navigate my mind.

Paul Gary Phillips

# Overview: Sharing My Programming

## ***User Interface***

- How you interact with the program.

## ***Quick Navigation***

- How you jump to a tool area.

## ***Save What You Like***

- How you take your art out of this program.

## ***Things That Are Not Obvious***

- How to see actions that do not change the display or
- How do some things that work a bit differently than expected.

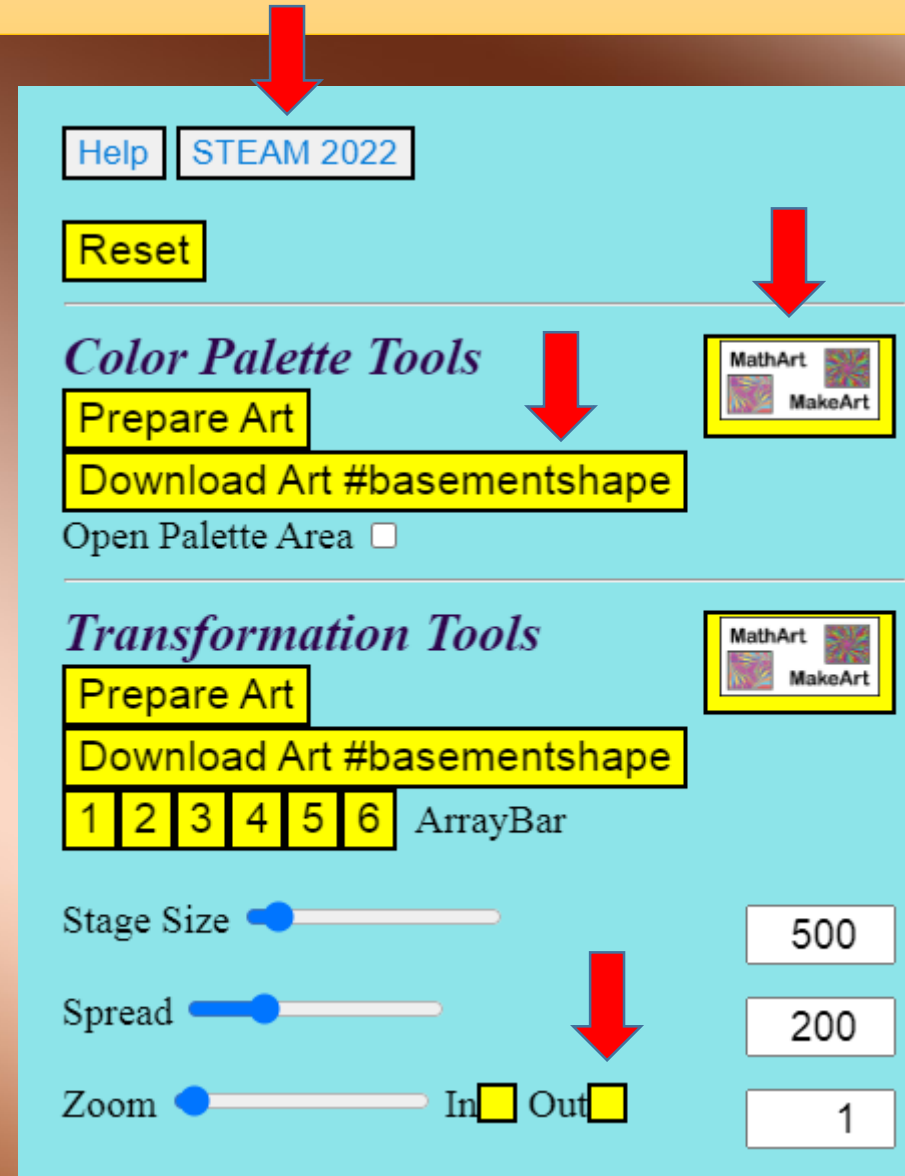
# User Interface

- **Buttons**
- **Sliders With Input Fields**
- **Checkboxes**
- **Radio Buttons**

# User Interface: Buttons

- Yellow
- Gray
- Picture Button

The **MathArt MakeArt** picture button generates an new set of slider numbers making a new pattern.



# User Interface: Sliders With Input Fields

**Transformation Tools**

MathArt MakeArt

Prepare Art

Download Art #basementshape

1 2 3 4 5 ArrayBar

Stage Size  500

Spread  200

Zoom  In ☐ Out ☐ 1

Layers  40

Rotate  ☐ 3

Scale  ☐ 0.05

Skew X  ☐ 0

Skew Y  ☐ 0

**Basement Modification Tools**

MathArt MakeArt

☐ Duplicate Shape #basementshape

Rotate Basement  ☐ 0

Scale Basement  ☐ 1

Lock Scale ☒

Scale X Basement  ☐ 1

Scale Y Basement  ☐ 1

Skew X Basement  ☐ 0

Skew Y Basement  ☐ 0

Move X Basement  ☐ 0

Move Y Basement  ☐ 0

☐ Duplicate Shape

Flip Left ☐

Flip UP ☐

# User Interface: Checkboxes

- Turn on Random Values
- Lock out Random Values
- Turn on Copy Shape

Rotate  ☐

Scale  ☐

Skew X  ☐

Skew Y  ☐

Black ☐ White ☐

Lock background ☐ 0

☐ Duplicate Shape

Flip Left ☐

Flip UP ☐

Lock Shape. ☐ #basementshape

## Color Palette Tools

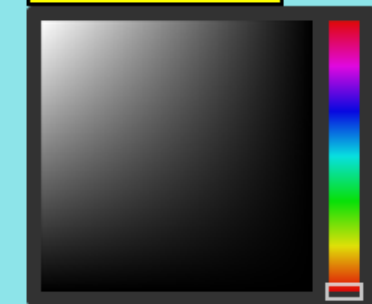
Prepare Art

Download Art #basementshape

Open Palette Area ☒

Drag Right Side Slider Color  
Click in the Box to Select Shade  
Click "ADD COLOR" Button

COLOR ADD



## Selected Color:

{ "r": 100, "g": 130, "b": 150, "a": 1 }

SHOW/HIDE PALETTE

NEW PALETTE

PASTE PALETTE

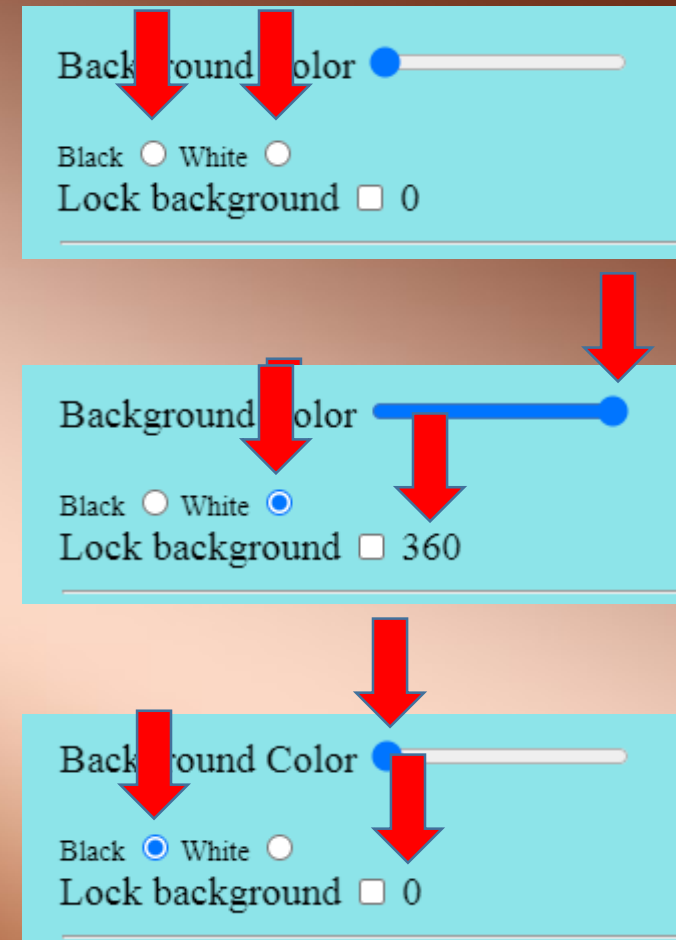
SAVE PALETTE

Random Palette Colors ☐



# User Interface: Radio Buttons

- Selects a preset Slider Value of 0 for Black
- Selects a preset Slider Value of 360 for White





# Quick Navigation: 9 Action Areas

TRANSFORMATIONS

COLOR SLIDERS

PALETTES

PRIMITIVES

BASEMENT TOOLS

MODIFICATION TOOLS

ARTDATA TOOLS

ART TOOLS

RESET

## Transformation Tools

Prepare Art

Download Art #basementshape

1 2 3 4 5 6 ArrayBar

## Color Palette Tools

Prepare Art

Download Art #basementshape

Open Palette Area ☐

## Primitive List

Prepare Art

Download Art #basementshape

## Basement Tools

Prepare Art

Download Art #basementshape

## ArtData Tools

Prepare Art

Download Art #basementshape

## SVG Tools

Prepare Art

Download Art #basementshape

Hue  10

Sat  100

Val  100

Alpha  1

Stroke Color  0

Stroke Width  2

Background Color  360

Black ☐ White ☒

Lock background ☐ 360

## Basement Modification Tools

☐ Duplicate  
Shape #basementshape

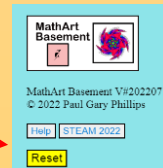
## Art Tools

Prepare Art

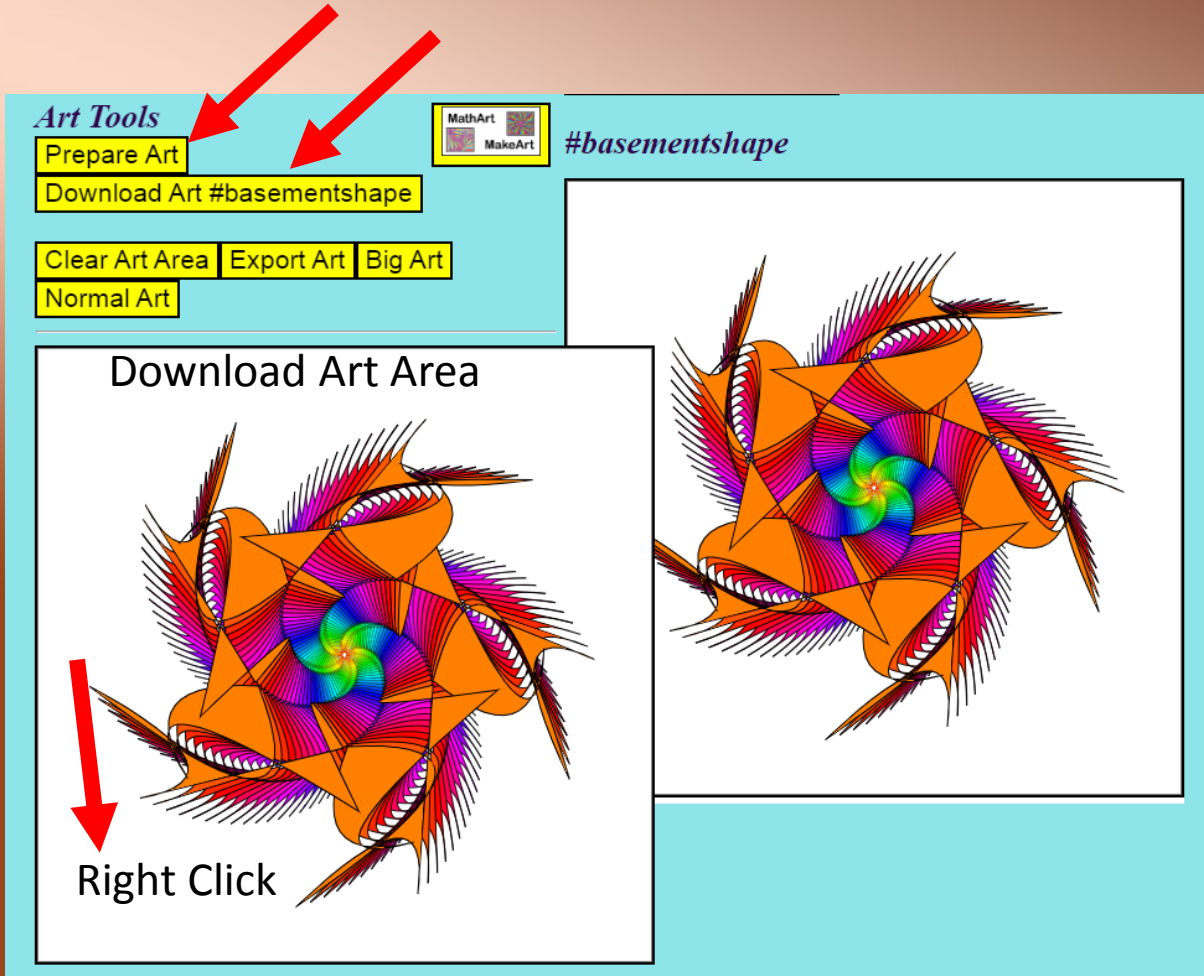
Download Art #basementshape

Clear Art Area Export Art Big Art

Normal Art



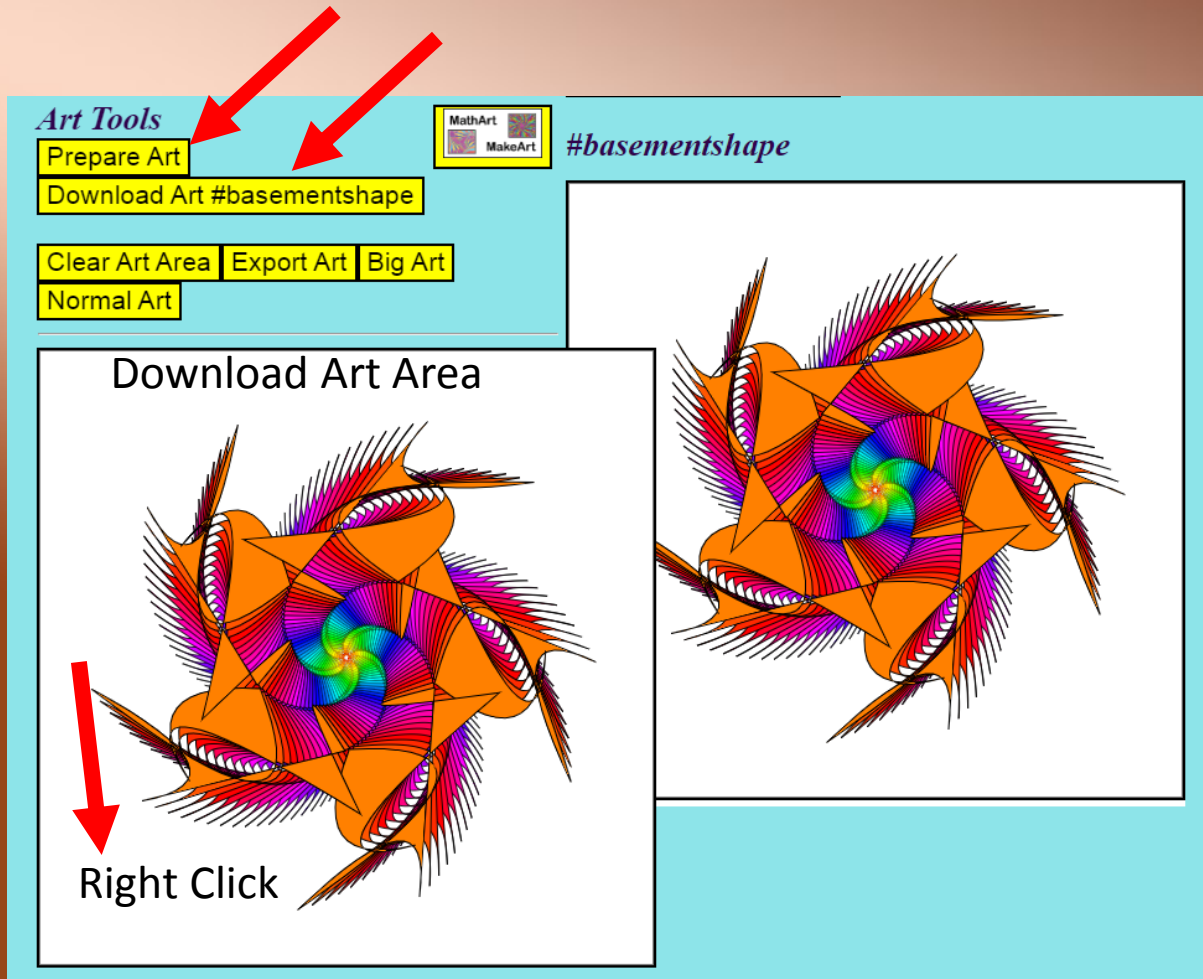
# Save your Image as a Raster Image



## Steps:

1. Click **Prepare Art**
2. Click **Download Art #kitchen**
3. Right Click on the Art Area
4. Select **Copy Image**
5. Paste Art into:  
PowerPoint, Photoshop,  
Email, Paint, or  
any raster art app.

# Save your Image as a Vector SVG file



## Steps:

1. Click **Prepare Art**
2. Click **Download Art #kitchen**
3. Right Click on the Art Area
4. Select **Save Image As ...**
5. Select Location to Save
6. Name the file as <name>.svg
7. Click **Save**

# Save What You Like

- Save Your Art Data
- Save Your Basement SVG Code



**Basement Tools**

MathArt MakeArt

Prepare Art  
Download Art #basement

1 2 3 4 5 6 ArrayBar

Basement ToBasement ClearBasement

Kitchen ToKitchen ClearKitchen

Defaults OneShape Recover

Show Basement Move Basement

Paste Art Data Save Art Data

Paste SVG Object  
Save Basement Shape

Kill Color in SVG Object.

Paste Image Address Type in Text

Clear Art Area Export Art Big Art  
Normal Art

**ArtData Tools**

MathArt MakeArt

Prepare Art  
Download Art #basement

Show/Hide Art Data  
Show/Hide Basement Data  
Paste Art Data Save Art Data

Lock Shape. ☐  
#basement

**SVG Tools**

MathArt MakeArt

Prepare Art  
Download Art #basement

Paste SVG Object Paste Image Address  
Type in Text  
Save SVG Object Save SVG Art  
Kill Basement Color

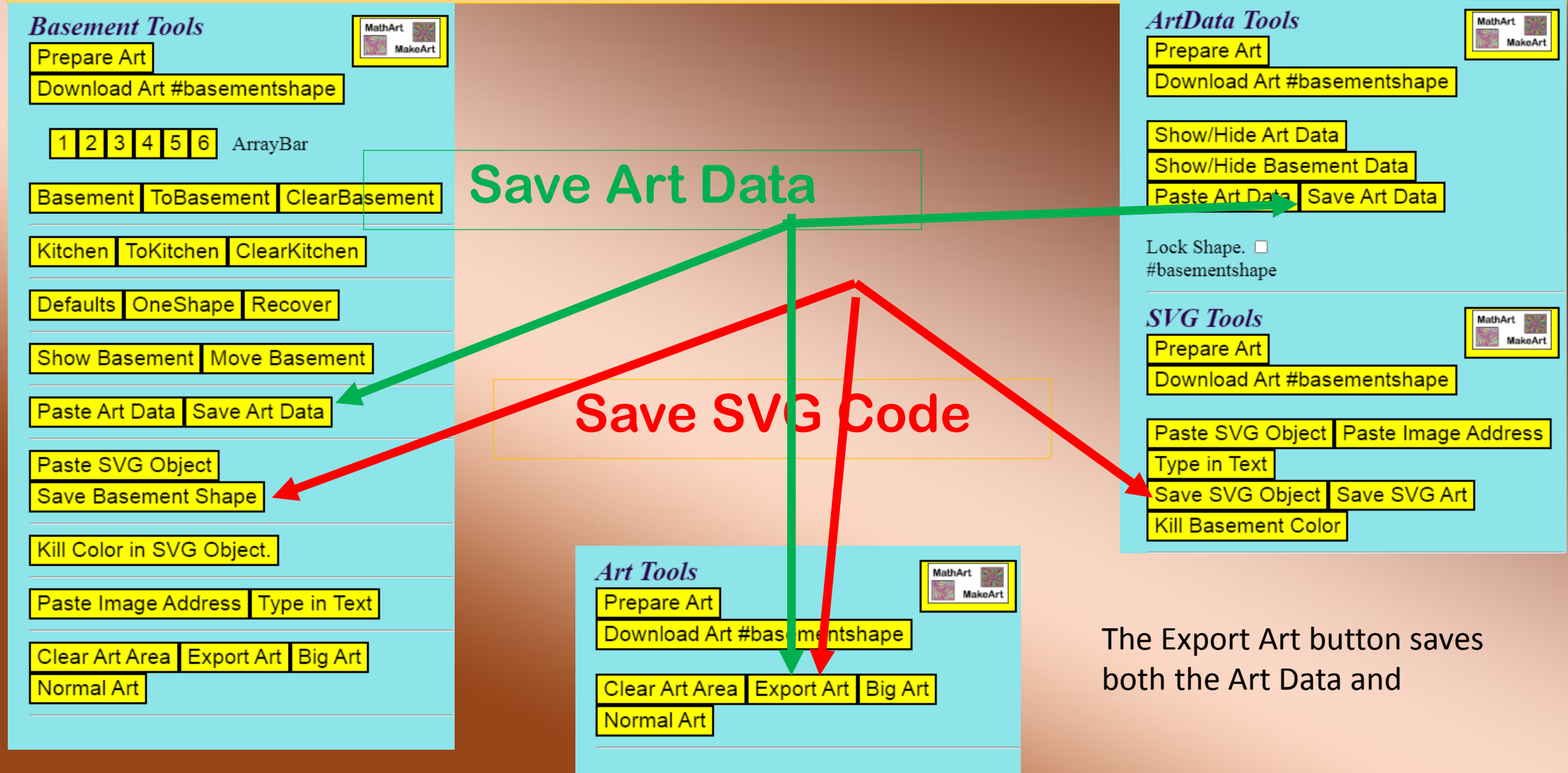
**Art Tools**

MathArt MakeArt

Prepare Art  
Download Art #basement

Clear Art Area Export Art Big Art  
Normal Art

# Save Both Art Data And SVG Code with **Export Art**





## Save With **Export Art** button

### Save Your Art Data

- Save Your **basement\_artData.txt**
- Or rename and Click **Save**

### Save Your shape

- Save Your **basement\_shape.txt**
- Or rename and Click **Save**

## Display Your Saved Data

- Open **\_artData.txt** file
- Copy the text
- Click **Paste Art Data** button
- Paste (Control V) the text
- Click **OK**

- Open **\_shape.txt** file
- Copy the text
- Click **Paste SVG Object** button
- Paste (Control V) the text
- Click **OK**

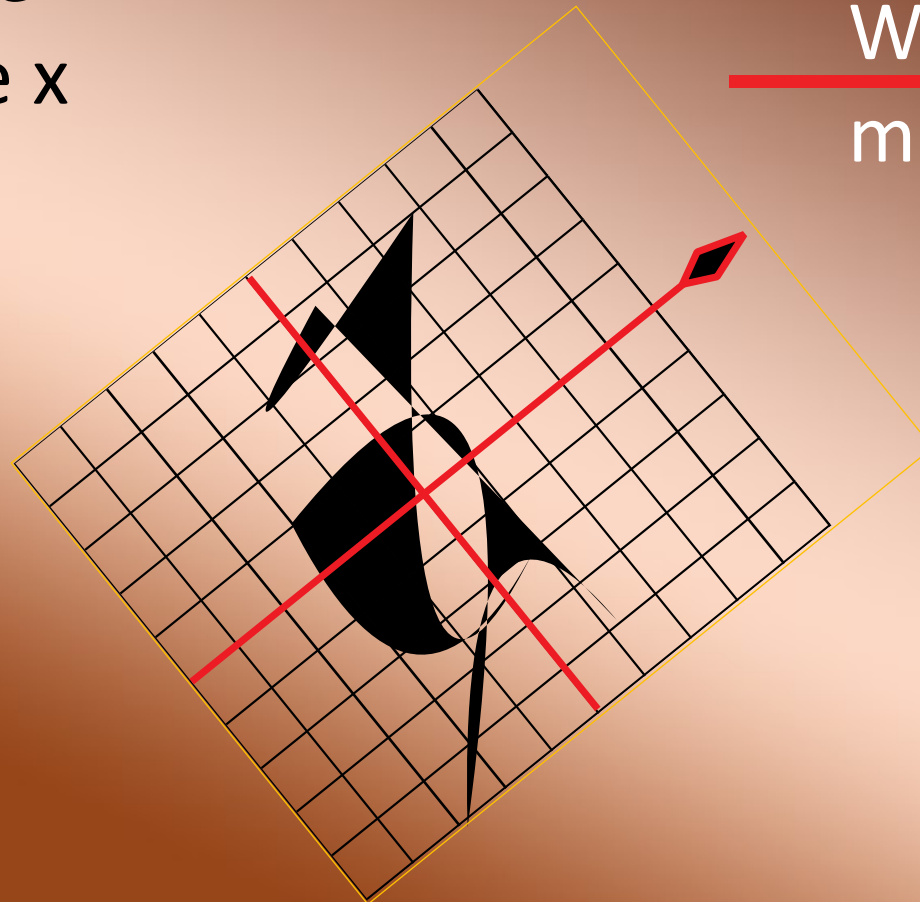
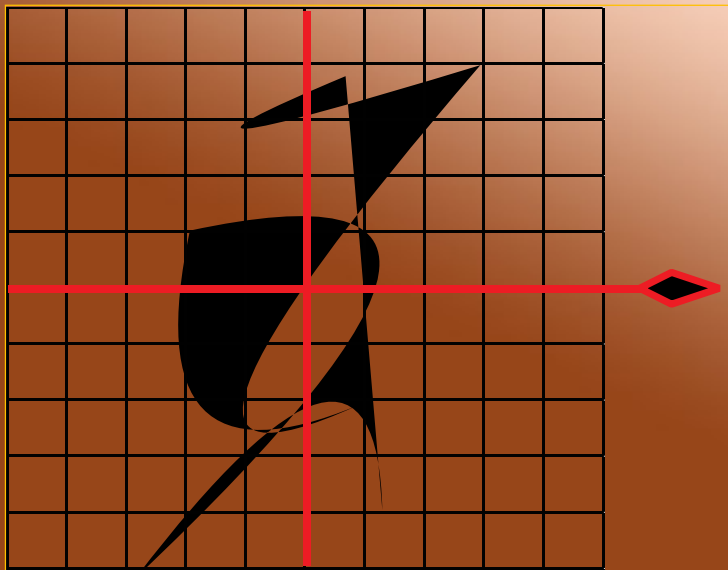
# Things That Are Not Obvious

- Dragging x-direction and y-direction
- The Kitchen
- The Sliders Checkbox
- The Palette Area
- The Lock Checkboxes
- The Random Shape Creators
- The Modification Tools
- Big Art
- The Basement Tools

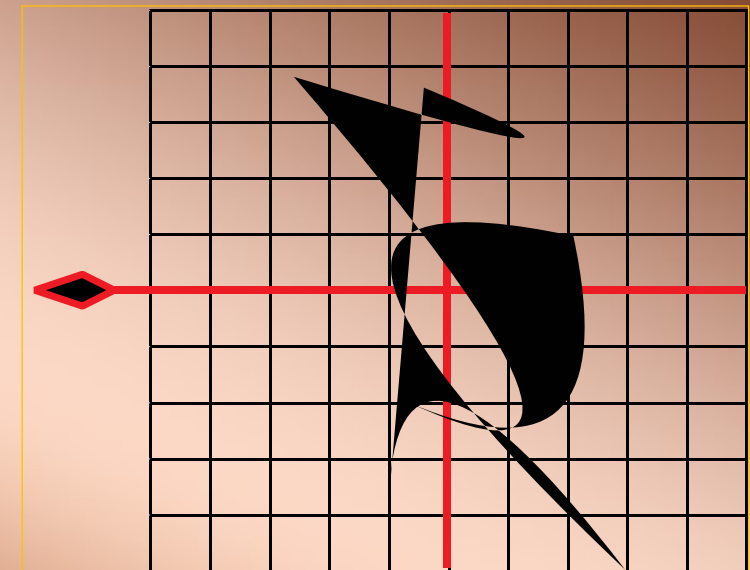


# Dragging x-direction and y-direction

When the mouse moves screen X, the shape moves in the x of the transform.



When the mouse moves X

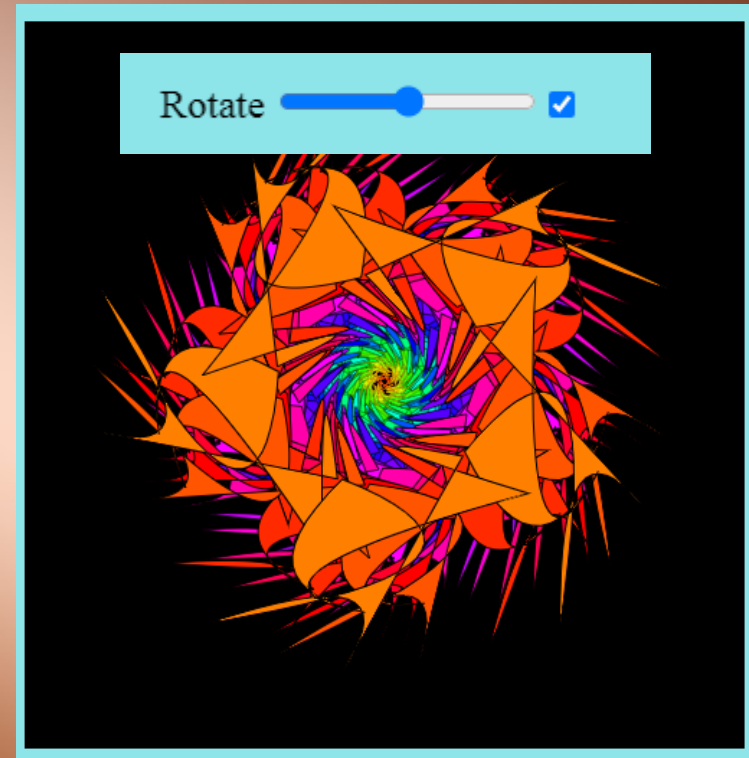
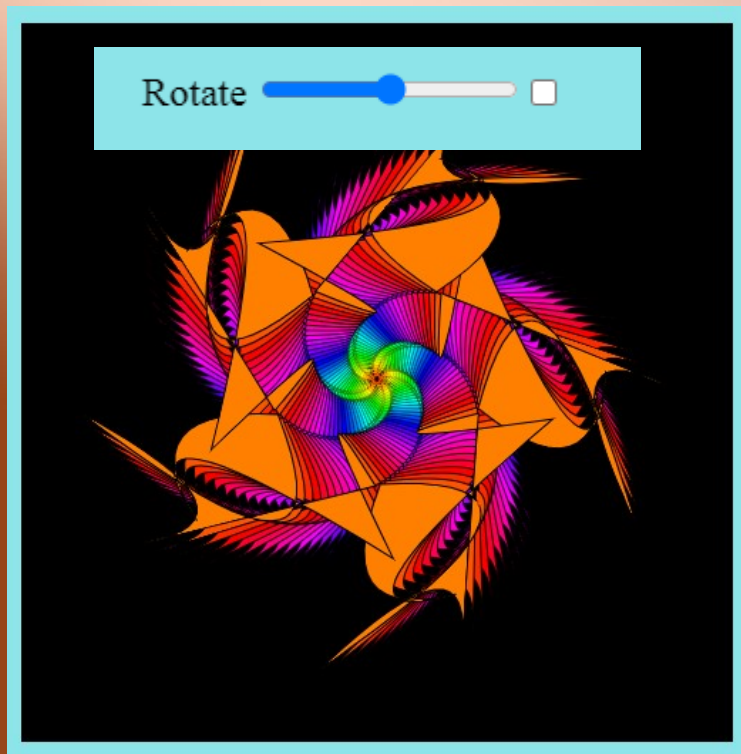


# The Kitchen

- The Basement is not in the shape library so it will not download like the other shapes.
- I created an empty shape called the Kitchen which is in the library. The **Prepare Art** button moves the basement design into the Kitchen.
- Notice: If the **Download Art** button says “#basement,” you must use the **Prepare Art** button to move the art to be able to be downloaded into a raster image.
- See what happens if you don't.

# The Sliders Checkbox

- The sliders checkboxes cause a random value to be generated for each layer instead of using the slider value for each layer.



# The Palette Area

- The Quick Navigation **PALETTES** button opens and closes the Color Palette Tools Area. So does the Open Palette Area checkbox.
- The Palette you create is applied to the design as long as the Color Palette Tools Area is open.
- Your palette is applied to the design every time you open the Color Palette Tools Area. If you like your palette use the **SAVE PALETTE** button.
- The **NEW PALETTE** button turns the display black until you select the **COLOR ADD** button.
- To apply an Alpha Value to a custom palette select the value and then add a color. The alpha is applied to the custom palette.

# The Lock Checkboxes

- The **MathArt MakeArt** button randomly selects a shape, a background color and all the slider values. If you have a complex shape in the basement and want to see random designs with that shape use the **Lock Shape** Checkbox.
- You can lock the background color to Black, White, or any color and it will not change when you click The **MathArt MakeArt** button
- The **Poly**, **Bezier**, and **Quadratic** set the **Lock Shape** automatically.



Lock Shape. ☒ #basement

Lock background ☒ 180

Poly

Bezier

Quadratic

# The Random Shape Creators




- These buttons generate a random shape with a random number of points and random (x,y) values for each.
- Each time you click the button a new shape is made and the old one is lost.
- **Warning:** The shapes are generated in the Basement so anything you have in there must be moved to a cleared out Kitchen or it too will be lost when you click one of these buttons





# The Basement Modification Tools


- These tools work to modify the objects in the basement.
- The **Defaults** button cycles through a collection of Modification Tools values.
- The Sliders modify the collection of shapes in the Basement.
- The Duplicate Shape check box makes the flip buttons copy the collection of shapes. These shapes may be dragged where you want them.
- **WARNING:** The changes made with these tools are not transferred out of the Basement. To save the image created with the modification tools you must do a screen capture with some third part tool.


*Basement Modification Tools*


**Defaults** 


Rotate Basement  0


Scale Basement  1


Lock Scale ☒ Scale X Basement  1

Scale Y Basement  1


Skew X Basement  0


Skew Y Basement  0

Move X Basement  0

Move Y Basement  0

☐ Duplicate Shape

Flip Left 

Flip UP 



# Big Art

- **Big Art** button was added when I was creating polar fleece blankets with my designs on them. They needed a high resolution image to send to the blanket printing company.
- The **Big Art** button changes the **Stage Size** to 5000 px.
- Click the **Download Art** button.
- I right clicked on the giant image on the stage and pasted into PhotoShop.
- I click **Clear Art Area** and **Normal Art** to return to my work.

## Art Tools



Prepare Art

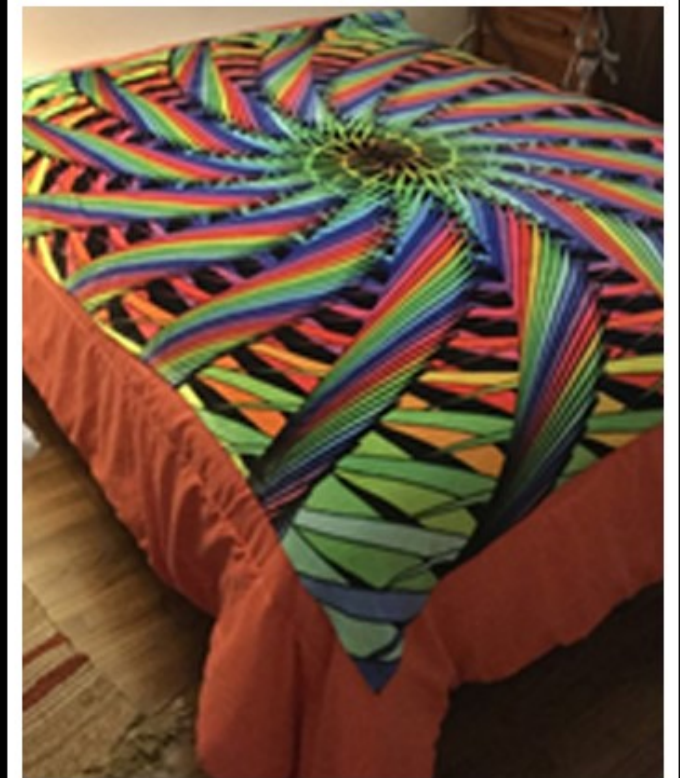
Download Art #base

Clear Art Area

Export Art

Big Art

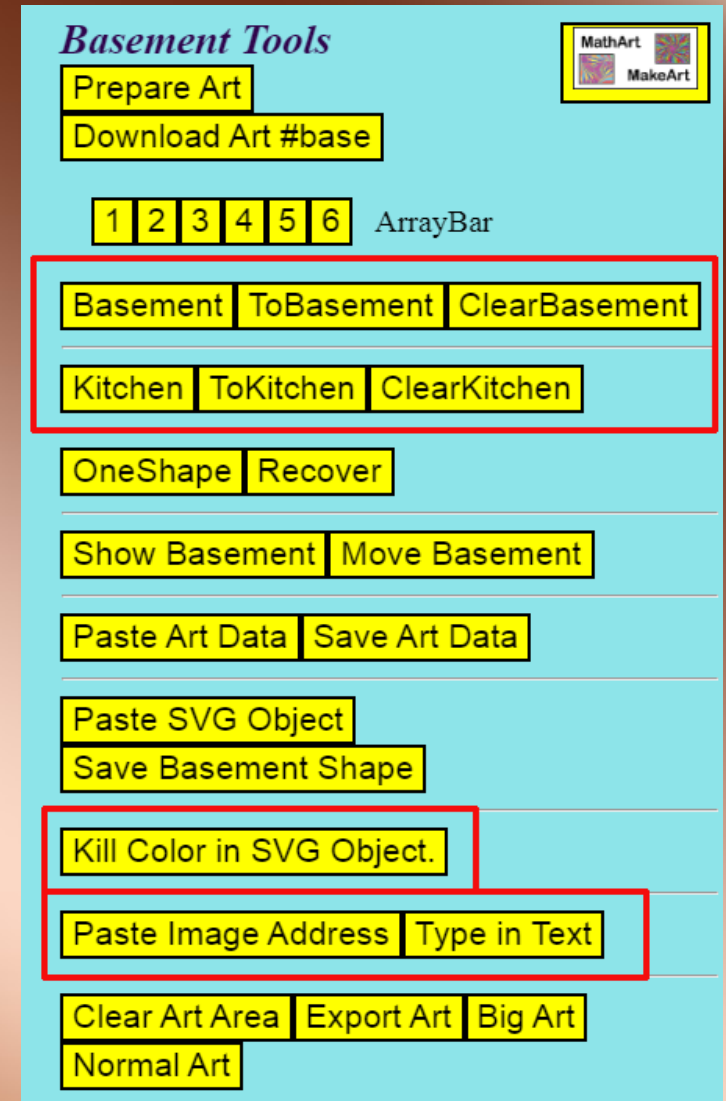
Normal Art



# The Basement Tools

- The Kitchen and Basement tools reside here.
- The **Kill Color in SVG Object** button removes the color from the pasted objects so they will respond to the sliders.
- **Paste Image Address** and **Type in Text** were added as special effects for me. They are not friendly. Type in your name.
- The Image address has to be saved on the web and secure.

<https://paulgaryphillips.com/imagesofpaul/imagesofpaul000.jpg>



**Have Fun!**