

World Biotech Tour Activity: **Micropipetting-by-Number**

The following document details the instructions to create a custom “Paint-by-Number” Micropipetting Activity, such as the one used at ASTC2014 in Raleigh. This will be part of the World Biotech Tour sponsored by Biogen Idec Foundation.

CREATION OF THE IMAGE PATTERN ON CANVAS:

To create a custom “paint-by-number” canvas for the Micropipetting Activity, a digital image of the item to be depicted will need to be processed with a special software program:

- The software used is Stoik Stitch Creator Version 4 for the PC.
<http://www.stoik.com/products/hobby/STOIK-Stitch-Creator/>
\$49.00 USD
- The digital image used was about 800 x 600 pixels at 150dpi. The resolution only needs to be high enough to include the level of detail to be shown in the painting.

General Procedure:

- Manipulate image file with a photo editing program as desired to get the preferred coloring and crop out unwanted regions.
- Open Stitch Creator and use Stitch Creation Wizard
- Select “Open Picture From Disk” to use an image file saved to the computer or flash drive
- Select image file and click “Open”
- Use the tools in the window that comes up to adjust the size and orientation of the image, then click “Next”
- Use the tools in this window to adjust the brightness, contrast, and other features of the image, then click “Next”
- Set the number of paint dots (“stitches”) you want across the painting horizontally and vertically (We used 96 horizontal and 72 vertical to give

us a Canvas size of ~24" x 18"). You can edit this once you choose your stitch/inch dimension to set the image to the size of your canvas.

- Set the number of dots-worth of blank margin you want around the image (we used 0), then click "Next".
- Choose the Canvas type (Evenweave) and Color (White), Choose the number of dots you want per inch ("stitches per inch") or centimeter depending on unit preference (We used 4 stitches per inch). Use the same number for horizontal and vertical, then click "Next".
- Select the floss brand from the drop down list (We used "Week's Dye Works") which gives you the color choices you want (bright, soft, etc.) and the maximum number of different paint colors you want (We used 24).
- Click "For picture" to see colors chosen in the list below based on the floss brand you chose. You can Add and Delete colors from the list to get the exact colors you want.
- When done choosing colors, click "Finish".
- You can edit the original image by clicking the "Picture" option on the left menu.
- You can edit the colors, canvas size and stitch spacing by clicking the "Settings" option on the left menu.
- You can manually edit individual stitches or groups of stitches by clicking the "Stitch" option on the left menu.
- When finished, click "View", "Symbol Chart" in the top menu to see the number pattern.
- Choose "File", "Save Picture As", Choose location to save image of pattern, Choose "Save as type" file type (typically "JPEG Files (*.JPG)"), Name file, then Click "Save".

You might want to print out your number pattern to scale on paper to be sure it looks like you expect, then send it to a Commercial Photo or Print Shop to print onto canvas.

The Print Shop will use plain flat canvas material to print the image on. After the image is printed, have the printer stretch the canvas sheet onto the appropriately size wooden frame, and attach backing material and hanging hardware.

SEAL CANVAS IMAGE:

The image must be sealed so that the paint will stay in concise dots as opposed to soaking into the canvas and spreading irregularly:

- Coat the canvas, according to bottle instructions, using Liquitex Professional Clear Gesso and a wide soft brush.
- Do 2 coats.

- Allow to dry **WELL** between coats.
- Sanding will not be necessary.

PAINTS:

- To prepare you paints, print out a Color Key (“File”, “Print”, “Color Key”) as a guide for the color assigned to each number.
- Paints: Acrylic thinned with water to a consistency of maple syrup (not too watery, but not so thick it can’t be pulled up into the pipette).
- To test thickness, pipette 20ul of paint onto a non-porous surface. The paint should be thin enough to be picked up by the pipette tip, but thick enough to form a small bead without spreading out.
- We primarily used Liquitex Acrylic paints (e.g. Titanium White Part No. 1077-432)
- We first mixed up the colors to match the color key then slowly added water until the desired consistency was reached.
- We prepared the paint in 50ml conical tubes, which keeps the paint fresh for extended periods of time.
- For the activity, we shook the tubes well then poured the paints into labeled 6-well micro-well plates. Fill the wells only about half-way to minimize mess then add more from the tubes as needed.

MICROPIPETTES:

- We used p200 micropipettes set at 20ul to produce drops of approximately 1/4” across (~3mm).
- We used wide-bore pipette tips, which more easily picked up the paint.
- If smaller drops are desired, then a smaller pipette could be used along with regular bore pipette tips.

MISCELLANEOUS ARTICLES:

- Waste bucket for used tips
- Lab tissues to wipe paint off micropipettes
- Wet wipes/paper towels for hands and other surfaces

DISPLAY:

With all of this assembled, set out the canvas on a mobile cart along with paints in the 6-well plates, micropipettors with a box of tips, and the miscellaneous articles listed above. Create an attractive sign for the cart so people are aware of the activity and its purpose. The sign could even include a bit of art history, explaining about “Pointillism,” and its creators: Georges Seurat and Paul Signac, as well as any scientific information about the image being created.