Logo Adventures Lesson 3: Drawing Figures

Open your MicroWorlds software. The first thing we are going to do is see if we can remember how to make a square. We have to type in the code for one leg of the square, and then turn the turtle's head ready to make the next leg. Do you remember?

fd 50 rt 90

He didn't put his pen down! What do we do? **pd** of course!
Now execute **fd 50 rt 90** four times by putting the cursor at the end of the line and pushing **<enter>.** While we're at it, let's remember another way to make a square: Move the turtle somewhere else. Type this:

bk 50 lt 90

Execute that one four times too!

But we want to use **repeat**, to make our lives easier. We need to repeat **fd 50 rt 90** four times. Do you remember how?

repeat 4 [fd 50 rt 90]

Drag your turtle to a new spot. Make a new square by putting the cursor at the end of the Command Center line and pushing **<enter>.** Keep doing it. We want squares everywhere!

Now, how do you make the square a different size? We have to tell the turtle to go forward a different amount. Change the *input* to **fd** (the number after it), so we have **fd 20** or whatever. Make more new squares of different sizes, in different spots all over the screen.

Let's color them in! Go to the Drawing Center. In MicroWorlds 2.0 this is under the

paintbrush next to the Command Center.

In MicroWorlds EX it is under the paintbrush at the top of the screen. This opens a popup window. In the popup window, select the large paintbrush on the upper left.
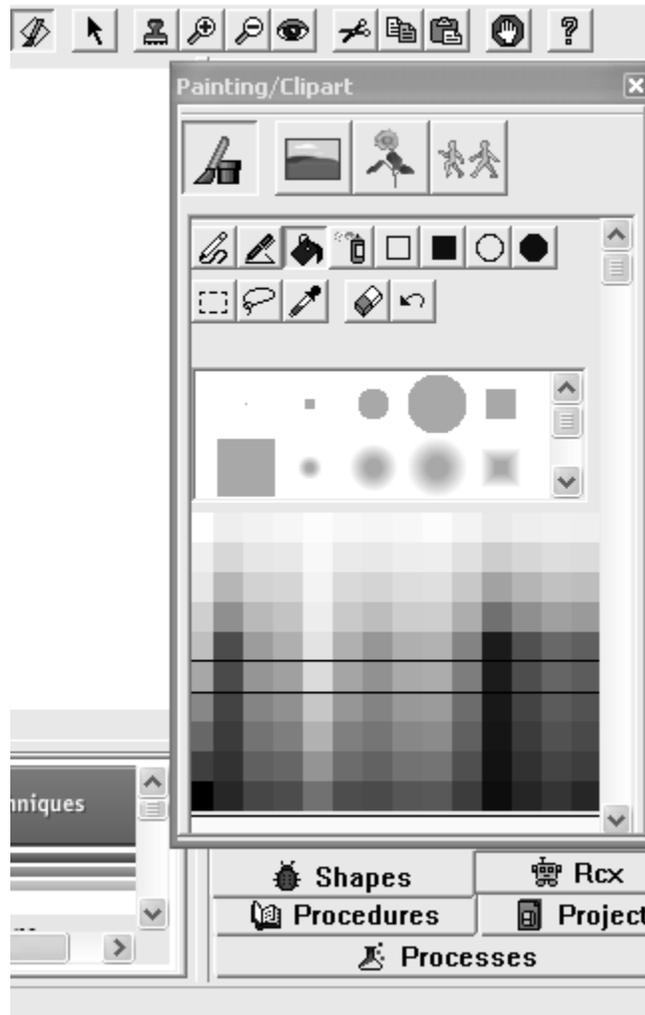
In either version of MicroWorlds , select a color and the paint bucket. Touch the inside of the square you drew. Voila! Now make a collage of squares of many colors. If you want to print it, go to the **File** menu at the top right, then **print project**, and select your printer. Then push **print**. Or you can save the project. Under the **file** menu, find **save project as**, and find the folder with an up arrow. Keep clicking on that until you arrive at the desktop, and then save with a simple name, such as **squares**.

Now type **cc cg pd**. Let's make a collage of stop signs. Remember the code for a stop sign? Remember the turtle goes forward, turns ½ of 90 degrees, and gets ready to repeat all that again, like this:

Our code for this one section of a stop sign is this:

fd 50 rt 45

Execute that a bunch of times to make a stop sign. How many? Now we'll use repeat:

repeat 8 [fd 50 rt 45]

How do you make a smaller stop sign? (Hint: change some numbers. Which ones?) Drag the turtle somewhere else and make a smaller one. Then make a larger one. Make them all over the place. Now color them in. Save this collage too.

Start a new file, and hatch a new turtle if you need to. Do you remember how to make an E?

Here's how. Type **cg**, so the turtle is in the center of the screen facing up. Let's start drawing the E from the bottom of the E. First the turtle needs to turn left 90 degrees and put his pen down. Then he needs to go forward a ways, say 50 steps. Then what? Look at the answers for Lesson 2 if you are stuck. Now make 30 E's all over the page.

Now, see if you can remember how to draw the staircase.
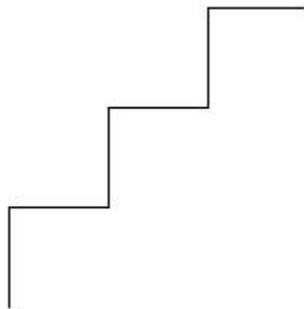
First you draw one step. Then you take that code and repeat it three times. Can you do it? Look at the answers for Lesson 2 if you are stuck.

We want to experiment with other angles. How far does a turtle turn when we tell it **rt 20**? Give it a shot: Type **cg**. Now try **rt 30.** Type **cg,** then **rt 45.** Type **cg,** then **rt 60**. The higher the number, the farther the turtle turns, right? Remember turning a street corner is turning a 90-degree angle. If the number is less than 90, it will be less than a street-corner turn.

Guess how much to turn to face the opposite way? Experiment. (Your adult should know the answer to this.)

Now type **cg cc**. Make a figure by repeating this: **fd 40 rt 20 bk 20**. Put that code in brackets and tell it to repeat the code 100 times. What did you get? Now change it by changing the angle (the number after the **rt**). Make three different figures and show your adult. What is different about these fuzzy circles?
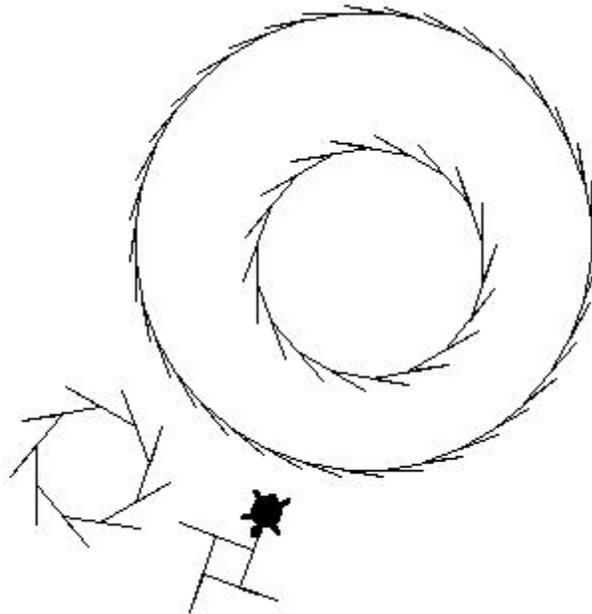

When we changed the size of a square or an octagon, we changed the number of steps the turtle went forward. But here, we didn't change that—we changed the angle. But the size of the fuzzy circle changed a lot! Funny thing, huh?

Let's play with colors a bit, using programming this time. We can tell the turtle what color to carry around in its pen or its bucket, using a special number code. Each color has a number assigned to it.
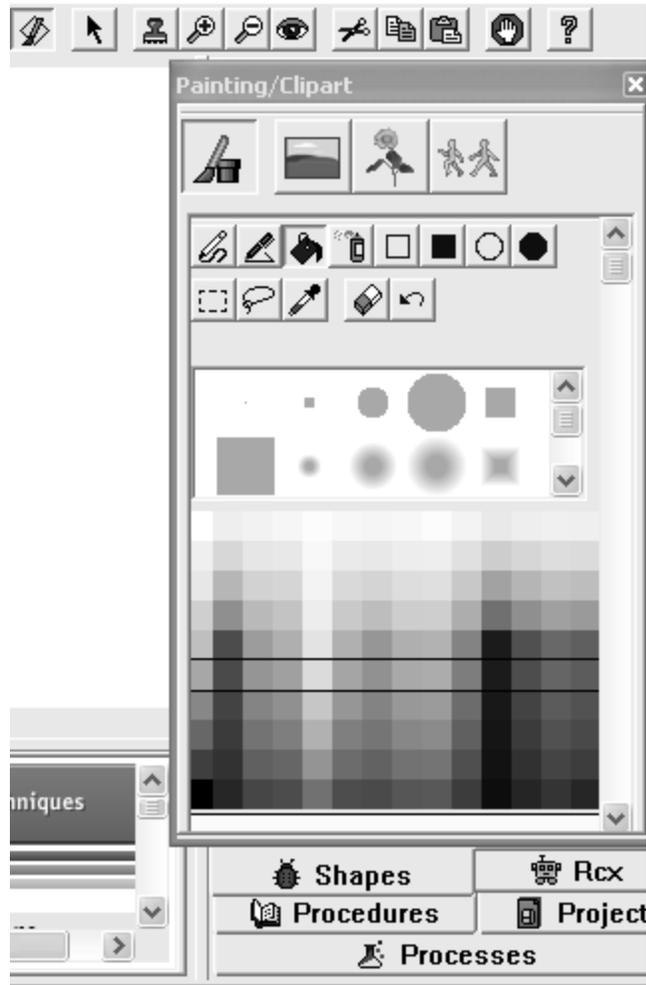

In MicroWorlds 2.0, go to the Drawing Center (under the paintbrush) and pause your mouse arrow over a color. The number for the color pops up. For instance, red is 15, and sky blue is 95. Notice that there is a slider on the right border of the color

squares, and you can slide it to make the colors darker or lighter. The numbers change
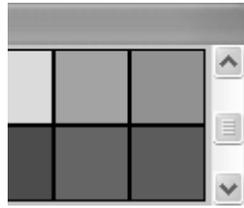
when you do that.

In MicroWorlds EX,

MicroWorlds EX Drawing Center

go to the Drawing Center by clicking the small paintbrush icon at the top of the page.
Click on the large paintbrush icon in the resulting window. Click on one of the colors.
The blank line at the bottom of the screen is a status bar that will tell you the number for
the color. By clicking on the color, you have selected it; now also click on a pen, bucket,
or spray can to apply color to the graphics page. The gray shapes in the middle are your
pen tips. Experiment!

Now that you know how to find your color numbers, let's proceed.

There's a procedure **setc** for setcolor. It sets the color the turtle is toting around. Let's type this in the Command Center:

> **setc 15**
> **fd 50**

We see the turtle turn red, and its line turns red too!

So how do you think we can turn its pen color to blue? First find the number for the blue you want. Put it where I have question marks. This is your input to **setc**.

> **setc ??**
> **fd 50**

Don't forget a space before your input! Try a bunch of different colors.

Now, change the background color using **setbg** for set-background. That has the same format as the instructions above:

> **setbg ??**

Save your work.