

EVANGELOS C. ZIOULAS

IT Teacher



CHAPTER 4

SHAPES, CLIPARTS & GRAPHICS



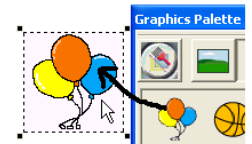
CLIPARTS ON THE BACKGROUND

The images from the **Clipart library** can be used as background images on our pages. Background images are not like turtles. They are **static** images and they **cannot be programmed**.

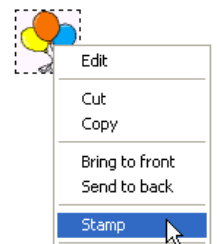
If the Clipart library is not showing, we should click on the **Painting/Clipart palette** button in the Toolbar. Then we can click on one of the three clipart buttons, **Backgrounds**, **Singles**, and **Sets**:



We **drag the shape** of our choice from the Clipart palette to the page. The image appears on the page.



We can **move** the image around and **resize** it by dragging one of its "corners". We should hold down the **Shift** key if we want the image to maintain the same proportion. If we have lost the "corners", we should simply drag a region around the image to select it again.



When the image has the right position and size, we right-click on it and choose **Stamp** from the menu. The image is now part of the background. You can draw over it, erase it, etc.

SET CLIPARTS AS PUBLIC SHAPES

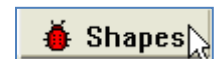
A **Public shape** is a shape that any turtle in the project can use.

If the **Clipart library** is not obvious, we click on the **Painting/Clipart palette** button in the Toolbar.

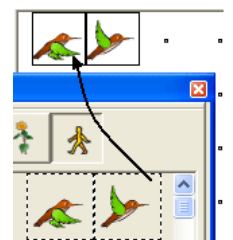
Then we click on either the **Singles** or the **Sets** shapes buttons:



We open the project **Shapes** tab by clicking on this tab, in which we probably see a full panel of small dots, representing free spots for pasting shapes.



Now we **drag** a few **shapes** from the Painting/Clipart palette to the project's Shapes tab. These shapes are available for any turtle to use.



Now, we create one or more new turtles, we open the backpack of one of them and we click on the backpack's **Shapes** tab. We see the Public shapes in **light gray**.



Now, we click in the **Command Center** and type the following commands:

setsh 1
setsh 2

← This means set the shape 1

The turtle now uses the different Public shapes, if there are some in these positions.

Public shapes **are not "attached" to turtles**. They are saved with the project but they are not included in turtles if we export them.

SET CLIPARTS AS PRIVATE SHAPES

A **Private shape** is a shape that can be used only by the turtle who "owns" it.

If the **Clipart library** is not obvious, we click on the **Painting/Clipart palette** button in the Toolbar.

Then we click on either the **Singles** or the **Sets** shapes buttons:



We select a few shapes; we click on one and holding down the **Shift** key we click on the last shape of the list that we wish to copy:



Then, while the shapes are selected in the Painting/Clipart palette, we click on the turtle. The turtle **looks like one of the shapes**, although it has all the shapes in its shape list.



We open the turtle's backpack and look at the contents of the **Shapes** tab. These shapes are now available for "this" turtle to use.

```
setsh 1  
setsh 2
```

Now, we click on the **Command Center** and type the following commands:

The turtle now uses the different Private shapes, if there are some in these positions.

Private shapes are **"attached" to turtles**. They are saved with the project and they are also included in turtles if we export them.

DIFFERENCES BETWEEN PUBLIC & PRIVATE SHAPES	
PUBLIC SHAPES	PRIVATE SHAPES
They can be used by any turtle	They can be used only by the turtle who "owns" those shapes (has the shapes in its backpack)
They are stored in the project Shapes tab . They appear in the Shapes tab of the turtle's backpack as gray silhouettes in order to let us know their shape numbers. However, they cannot be moved, deleted or edited from the turtle's backpack.	They are stored in a turtle's backpack . If there is a Private shape in the backpack Shapes tab that is "covering" a Public shape, the turtle always uses the Private shape . The private shape has priority over the project shape.

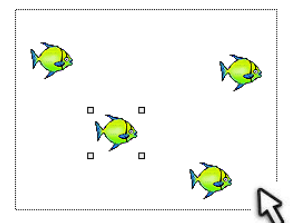
REAL TURTLES & STAMP SHAPES

Clipart can be used as **turtle shapes** or simply dropped on the page as **graphics**. But, how can we distinguish a real turtle between a set of graphics?

First, we create a set of **identical background clipart** (e.g. fish) by dragging the shape from the Clipart palette to the page multiple times and after that right-click on each image and choose **Stamp** from the menu. Second, we create a turtle and give it exactly the same shape.

To distinguish the turtle between the background clipart we choose **Select All** from the **Edit** menu. The **shapes with dots** at their corners **are turtles**. The shapes without the dots are background graphics.

We can move only the turtles simply by dragging them with the mouse. To clear or relocate the background graphics after they are stamped we need to use the **Painting tools**.



EDITING SHAPES

The contents of the **Painting/Clipart** cannot be modified. If we need to modify a shape, we must first put it in the turtle's **backpack** or in the **project Shapes** tab. The same editing method works for both.

To edit a shape in a turtle's backpack, first we **create a turtle**, if we don't have one on the page. Then we assign a shape to this turtle by adding it to its backpack.

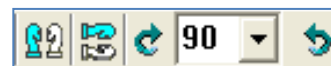
Now that the turtle owns this shape, we can edit it. We right-click on the turtle to open its **backpack** and click on the **Shapes** tab. We can see the shape is in the Shapes tab; we right-click on it and choose **Edit** from the menu.



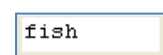
The **Shape editor** opens.

We can use the drop down menu to change the **zoom** factor:

We can use the following buttons to **flip** or **rotate** the shape and the drop down menu to specify the **angle** for the rotation or enter your own. This is useful for creating copies of a shape that each has a different heading.



We can change the shape's name inside the text box by using a "one word" name with no spaces. Also, the name cannot be the same as the name of another shape in the Shapes tab.



We can also drag one of the eight square dots to change **the size** of the drawing area, as well as we can use all the drawing tools to modify the image.



Finally, we click **OK** to save our changes, or **Cancel** to close the editor without saving.

If we want to create our own shape instead of modifying an existing clipart, we right-click on a blank spot in the **Shapes** tab and choose **Edit** from the menu.

SHAPE NAMES & SHAPE NUMBERS

To program a turtle to **use a specific shape**, we must know either the **shape's number** (its position in the Shapes tab) or the **shape's name**.

1st Step: We get some shapes for our turtle. To do it, we **create a turtle** and open its **backpack**. We click on the **Shapes** tab and **drag some shapes** from the **Painting/Clipart palette** to some free spots in the Shapes tab.

2nd Step: We find out a shape's name and number. To do it, we put the **mouse pointer over a shape** in the backpack. Its **name**, **number** and **size** are displayed.



3rd Step: We set the shape using commands. To do it, we click in the **Command Center** and type the following commands:

```
setsh 1
setsh 2
setsh "fish"
```

We must not forget the quotation mark when we use the shape's name.

Possible Issues:

- ▶ If a spot **number doesn't have a Private or a Public shape**, the turtle looks like a small dot.
- ▶ If we use a **shape name that does not exist**, we get an error message e.g.

```
setsh "fishes"
setsh does not like fishes as input
```
- ▶ If we **forget the quotation mark**, MicroWorlds thinks that the name is something to run (to execute) and displays an error message e.g.

```
setsh fish
I don't know how to fish
```

BRUSHES

The Painting tools draw with the current brush from the **Brushes palette**.

Outlined brushes use the current color, surrounded by a black outline.

Rainbow brushes use the current color in their center.

Turtles **cannot draw** using brushes, but we can use a brush to set the turtle's pen size:

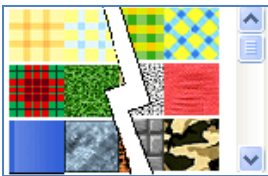
To do it, we click on a **brush** (if we leave the mouse pointer on a brush we get a description). Then we click on the **pencil** and finally on a **turtle**.



Now, we can put the turtle's pen down and make it move by typing the next instructions:

```
pd  
fd 50
```

PATTERNS



The Painting tools can also draw with the current **pattern** if we select one.

However, the turtles cannot draw with patterns.

We may use a turtle to draw a figure on the page and then use the **Paint can** to fill the area with a pattern.



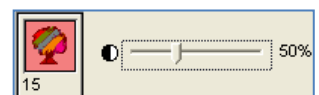
COLORS

To select a color for a painting tool, we click on a color in the **Colors palette**.

We can also use the **Color picker** tool by clicking anywhere on the page.

MicroWorlds finds the closest color in the Colors palette to the color on which we clicked. We can see the color in the **Color viewer**.

Use the **Opacity slider** to change a color's opacity. The color number remains the same but the drawings made with any color are semi-transparent. The color viewer shows the effect of each level of transparency.



SELECTING, RESIZING & MOVING GRAPHICS

To select background graphics, we choose a **selection tool**:



We click on the background and **drag to select** a region around the desirable graphic.



To **resize** the selected graphics, drag one of its corners.



To **move** the selected graphics, we drag it elsewhere. Only the background graphics move, not the turtles. We hold down the **Ctrl** key if we want to leave a copy behind as we move the graphics.



We can **drag turtles** separately using the normal pointer:



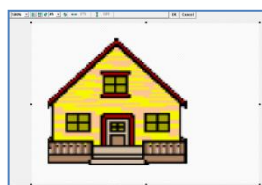
We can also **stamp the turtles** so their shape becomes part of the background graphics. (There is still a turtle there, also.)

EDITING GRAPHICS

To **edit** background graphics, we first choose a **selection tool**:

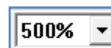


We click on the background and drag to **select a region** (objects, frozen graphics etc.).

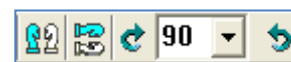


Then, we **click inside** the selected region to see it enlarged in the **graphics editor**.

We use the first tool to set the **zoom factor**.



We use the next tools to **flip** the image horizontally or vertically or to **rotate** the image to the right angle.



We can pull on the square dots to **change the size** of the drawing area. Finally, we click **OK** to save our changes or **Cancel** to discard them altogether.



To **delete** background graphics, we first click on the background and drag to select a region.

Then we simply press **Delete** or **Backspace** on the keyboard or **right-click** in the selected region and choose **Cut** from the menu.

COLOR NAMES & NUMBERS

We can use any of the **140 colors** of the **Colors palette** with the Painting tools, and we can use the **Pencil** tool to give these colors to turtles for drawing.

We can also use MicroWorlds commands to set the turtle's color (and pen color).

The command **setcolor** (**setc** for short) accepts **15 color names** and any number, including decimal, between **0 and 9999** (Since there are only 140 colors, the colors repeat when the number is greater than 139)

To figure out **color names**, we **right-click** on any color in the Colors palette. The names are:



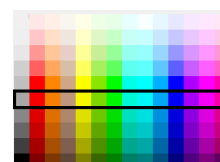
White, Gray, Black, Red, Orange, Brown, Yellow, Green, Lime, Turquoise, Cyan, Sky, Blue, Violet, Magenta, Pink.

If we click on any color, we can see its number in the **Color viewer**:



The **middle shades** (framed shades) are the color numbers ending with 5 and are those we get when we use color names.

As an example, we create a turtle on the page and in the **Command Center** we type the following commands that are the same:



```
setc "red  
setc 15
```

The **primitive color** always reports a number:

```
setc "red  
show color
```

It writes the color number 15

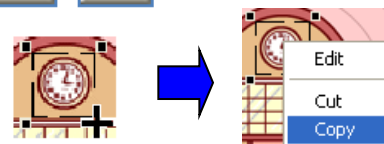
COPYING GRAPHICS INTO A SHAPE

To **copy** background graphics, we first choose a **selection tool**:

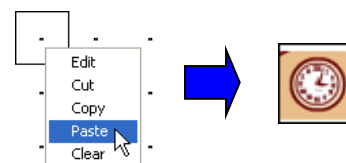


We click on the background and drag to **select a region**.

We **right-click** inside the region and choose **Copy** from the menu.



Now, we click on the **Shapes** tab (either the **project Shapes** tab or a **turtle's Shapes** tab in its backpack) and **right-click** on an empty spot and choose **Paste** from the menu.



The image appears in the set of shapes. If we want to get rid of some portions of the image, we **right-click** on the shape in the **Shapes** tab and choose **Edit** from the menu.

IMPORTING PICTURES

We choose **Import Picture** from the file menu to place a picture on the current page. We use the Open dialogue box to locate the file.

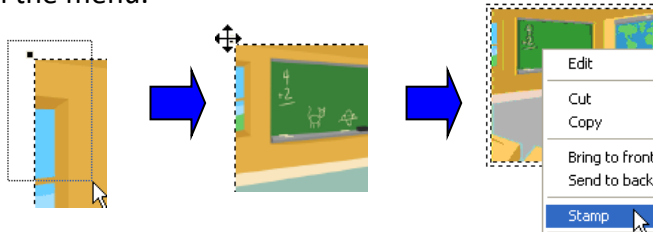
When we click **Open**, the image appears on the page. The dashed frame indicates that this is a **"floating image"**. While it is floating, we can drag the image around the page.



As a "floating object", the image may cover other objects we have on that page. These other objects reappear once we stamp the image.

To **resize** the image, we move it so you can see its "dashed" frame. Then we **select** the image by dragging around at least one of its edges. We resize the image by **dragging** one of its **corners**. We hold down the **Shift** key if we want to maintain the proportions of the image.

Finally, when we finish with the size and position, we **right-click** on the image and choose **Stamp** or **Stamp Full Page** from the menu.



The supported file formats are: **JPG**, **PNG**, **BMP** and **GIF**.

We can also drag and drop **animated GIF** files directly into the Shapes Tab in MicroWorlds. The multiple frames of the animated GIF will become as many shapes, allowing you to create our own animations.

EXPORTING PICTURES

To export the graphical contents of a page, we choose **Export Picture...** from the **File** menu.

In the **Save** dialogue box, we choose a location and a file type, and we type a name for our file.

If we don't specify a file type, the image will be saved in **PNG** format. We can also choose other formats such as **JPG**, **GIF** or **BMP**.

However, only the background graphics will be exported.

This includes:	This excludes:
A background color set by the setbg command	Unstamped Turtles
Background graphics drawn by the turtles or with the Painting tools	Unstamped (floating) graphical elements (with "dashed" frames around it)
Stamped turtles	Buttons, text boxes and other objects
Stamped text	Graphics from the Wallpaper