

Microworlds LOGO Notes

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command

action

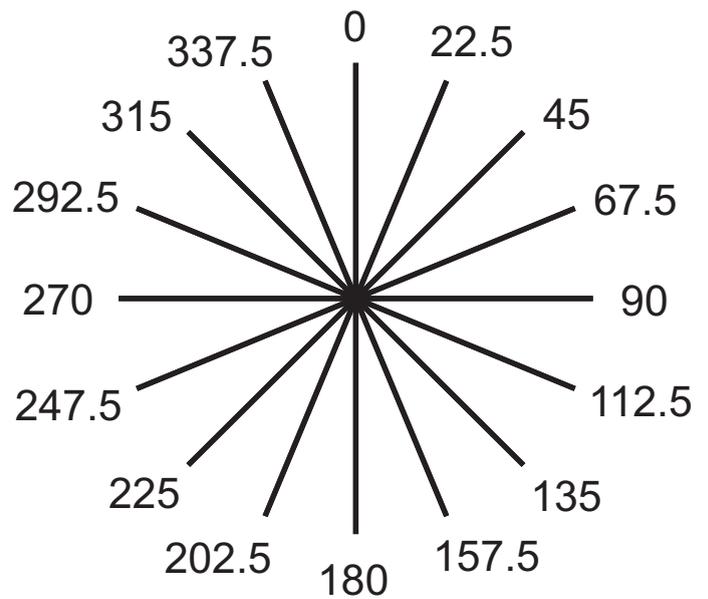
pd	pen down
pu	pen up
fd 100	move forward 100 steps
bk 50	move backwards 50 steps
rt 90	right turn 90°
lt 5	left turn 5°
repeat 4 [fd 100 rt 90]	repeat 4 times the commands in the square [] brackets make sure not to use round brackets () by mistake as they look very similar
cg	clear graphics
setpensize 5	set the pen size
setc "red	set the pen colour to red
setbg "green	set the background colour
setbg 0	Resets the background color
dotimes [i 10] [show :i]	
everyone [clickon]	simulate clicking on every turtle
everyone [clickoff]	turn every turtle off
show heading	show the turtles heading
seth 0	set the heading to North
seth 90	set the heading to East
seth 180	set the heading to South
seth 45.5	set the heading to North East

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`seth number`

Stands for set heading.
Sets the turtle's heading to the specified direction (in degrees). The degrees correspond to those of a compass: 0 degrees is due North, 90 is East, 180 is South, and 270 is West.

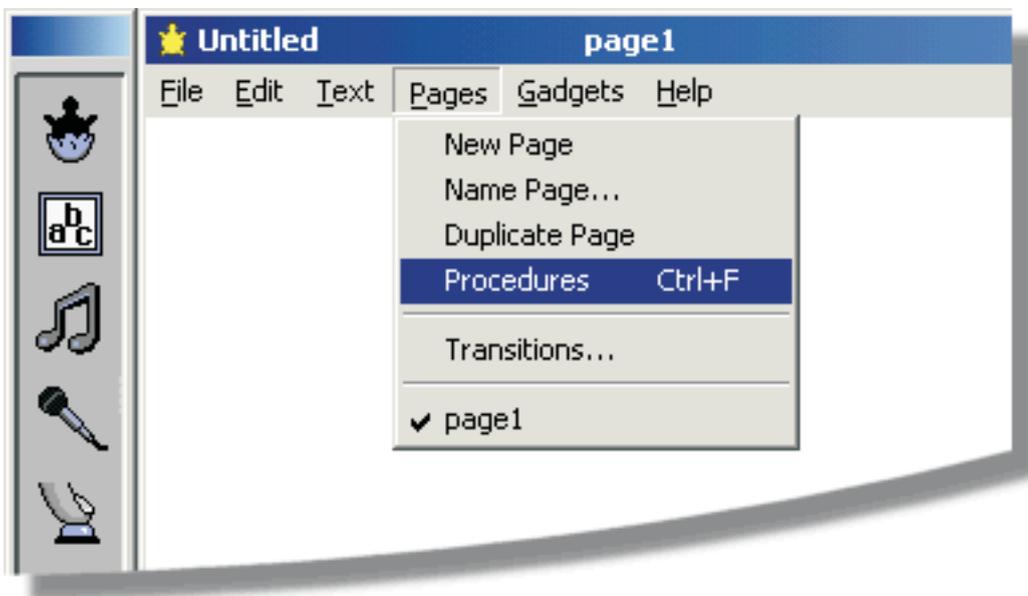
Right and left turn a turtle a number of degrees from its current heading. Seth makes a turtle point to a specific direction, regardless of its previous heading.



Procedures

A procedure in LOGO is a set of instructions that tell The turtle how to perform an action.

Procedures always start with the keyword **to** and end with The keyword **end**



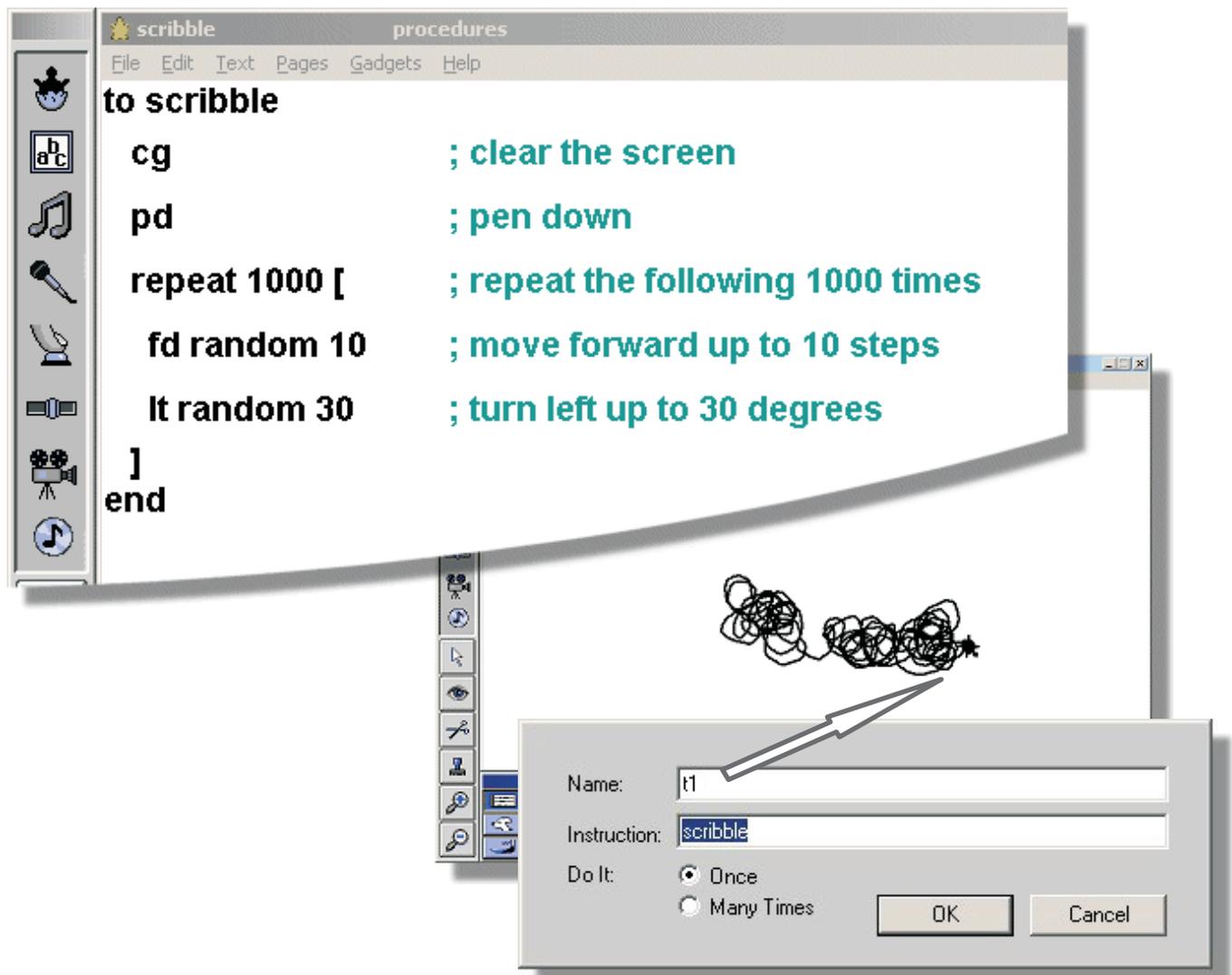
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Procedures cont...

The following is an example procedure:

```
to scribble
  cg                ; clear the screen
  pd                ; pen down
  repeat 1000 [     ; repeat the following 1000 times
    fd random 10    ; move forward up to 10 steps
    lt random 30    ; turn left up to 30 degrees
  ]
end
```

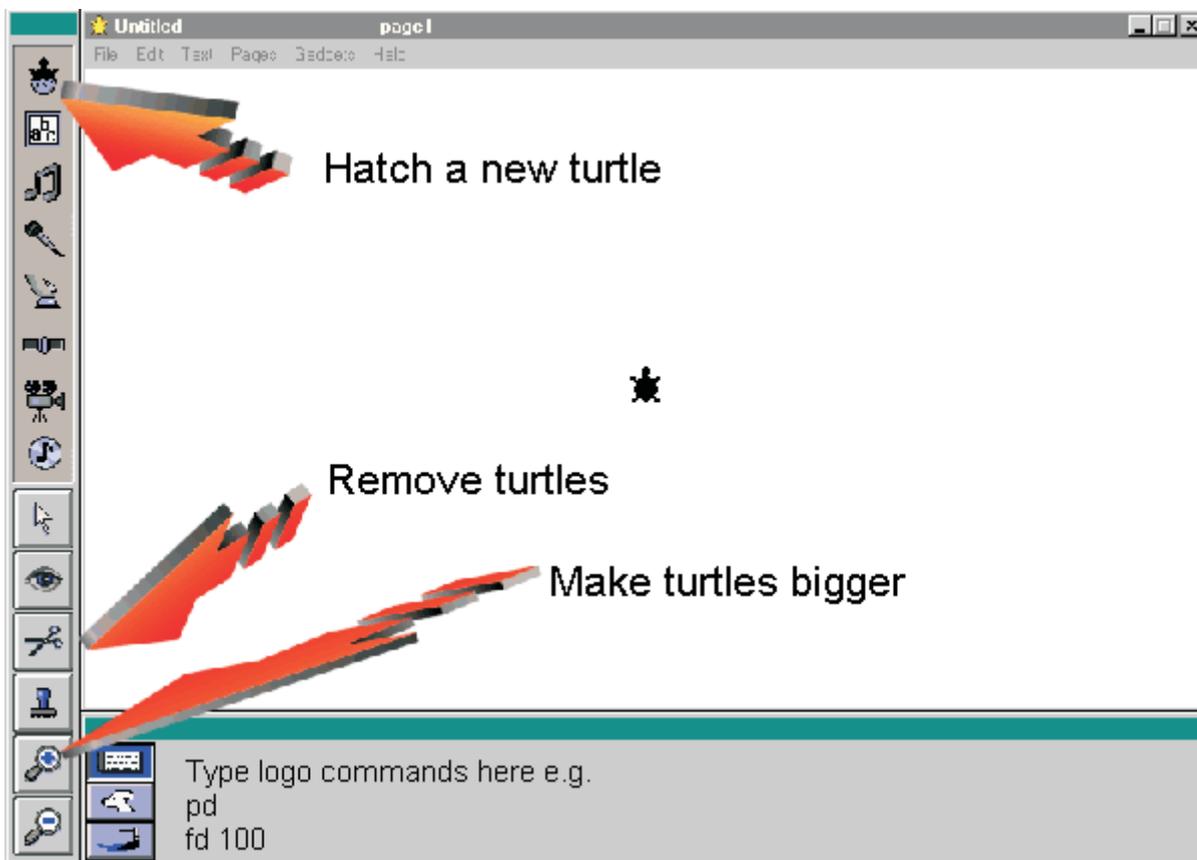
Right click on the turtle and give it the instruction ***scribble***

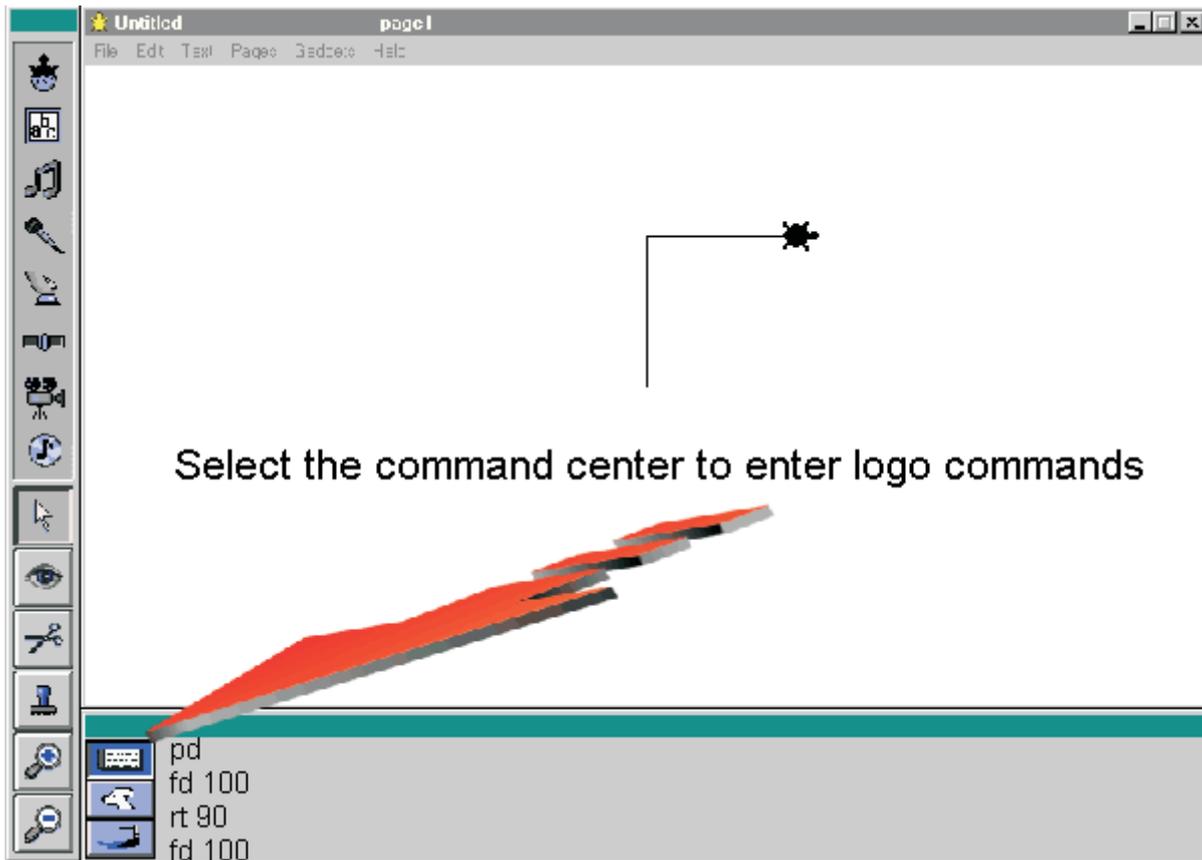


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pd	pen down
pu	pen up
fd 100	move forward 100 steps
bk 50	move backwards 50 steps
rt 90	right turn 90 degrees
lt 5	left turn 5 degrees
repeat 4 [fd 100 rt 90]	repeat 4 times the commands in the [] brackets make sure not to use round brackets by mistake they look very similar.
cg	clear graphics
setpensize 5	set the pen size
setc "red	set the pen colour

Make sure you put a space after each command. fd100 will cause an error, use fd 100 instead.





Enter LOGO commands in the Command Center.

In the Shapes Center, you can select a shape for the turtle, or change or create your own shapes.

Click ONCE on the shape of your choice and then click on a turtle.

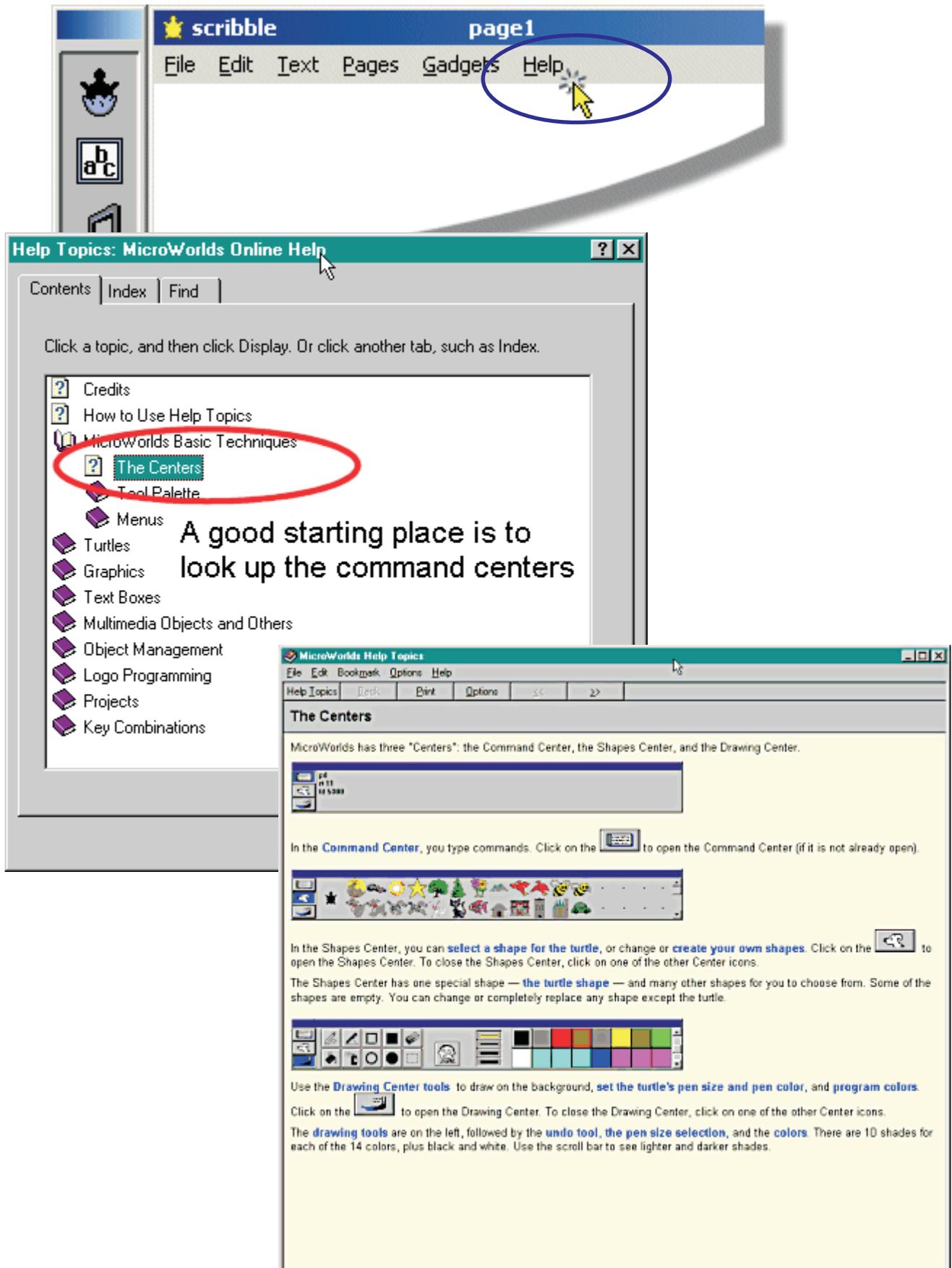


Use the Drawing Center tools to draw on the background, set the turtle's pen size and pen color, and program colors.

Note the cg command will clean your screen if you want to start again.



MicroWorlds has excellent built in help. The help file will tell you all you need to know to use MicroWorlds.



MicroWorlds Help Topics

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Moving and Turning the Turtle

You can move the turtle by dragging it with the mouse.



With the pointer, drag the turtle.

You can change the turtle's heading by dragging its head.



Point to its head, make it spin.

You can only turn the turtle by dragging its head if the turtle has the original "turtle" shape.

When there are two turtles, you can bring one to the front by pressing the **Shift** key while clicking on it. This feature is particularly useful when animating turtles in different shapes.



Click on the turtle while pressing the Shift key.

 **Related Logo Primitives:** [setpos](#), [seth](#), [forward](#), [back](#), [left](#), and [right](#)

MicroWorlds Online Help

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forward

forward (fd) *number*

Moves the turtle forward.

Examples:

```
pd fd 20 rt 90
pu fd 50
pd fd 10
```

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Last modified: December 3, 2003

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URL: <http://uob-community.ballarat.edu.au/~rrussell/tutorials/microworlds/bw.html>

[APA](#) citation:

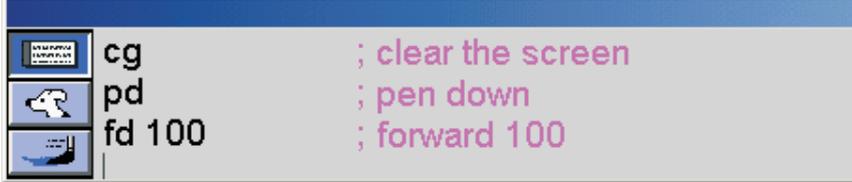
Russell, R. (2003, December 3). *Microworlds logo notes*. Retrieved December 3, 2003, from <http://uob-community.ballarat.edu.au/~rrussell/tutorials/microworlds/bw.html>

Introduction to Turtle Graphics

Contents:

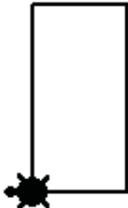
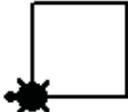
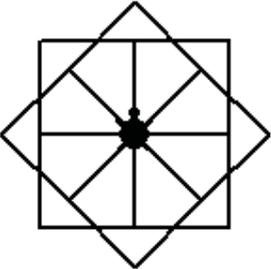
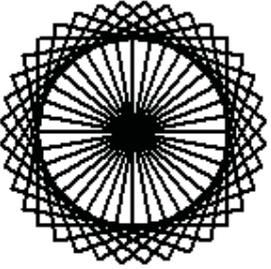
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Common LOGO commands

	<p>pd ; pen down so the turtle ; draws a line when it moves.</p> 
	<p>cg ; clear the screen</p> 
	<p>fd 100 ; forward 100</p> 

Common LOGO commands cont...

	<p>setpensize 2 ; draw with a ; thicker line</p> <pre> pd ; pen down setpensize 2 ; draw with a thicker line fd 100 ; forward 100 </pre>
	<p>setpensize 5 ; draw with a ; thicker line</p> <pre> pd ; pen down setpensize 5 ; draw with a thicker line fd 100 ; forward 100 </pre>
	<p>rt 90 ; turn right 90 ; degrees</p> <pre> pd ; pen down fd 100 ; forward 100 rt 90 ; turn right 90 degrees </pre>
	<pre> pd fd 100 rt 90 fd 50 </pre> <pre> pd ; pen down fd 100 ; forward 100 rt 90 ; turn right 90 degrees fd 50 ; forward 50 </pre>

	<pre>pd fd 100 rt 90 fd 50 rt 90 fd 100 rt 90 fd 50</pre>
	<pre>cg pd fd 50 rt 90 fd 50 rt 90 fd 50 rt 90 fd 50</pre>
	<pre>cg pd repeat 4 [fd 50 rt 90]</pre> <div data-bbox="539 1070 1393 1261" style="border: 1px solid black; background-color: #e0e0e0; padding: 5px;">  cg  pd  repeat 4 [fd 50 rt 90] </div>
	<pre>cg pd repeat 8 [repeat 4 [fd 50 rt 90] rt 45]</pre> <div data-bbox="539 1444 1393 1635" style="border: 1px solid black; background-color: #e0e0e0; padding: 5px;">  cg  pd  repeat 8 [repeat 4 [fd 50 rt 90] rt 45] </div>
	<pre>cg pd repeat 36 [repeat 4 [fd 50 rt 90] rt 10]</pre> <div data-bbox="539 1818 1393 2009" style="border: 1px solid black; background-color: #e0e0e0; padding: 5px;">  cg  pd  repeat 36 [repeat 4 [fd 50 rt 90] rt 10] </div>



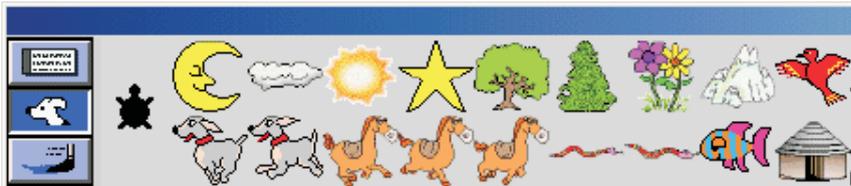
```
cg  
pd  
repeat 100 [ fd random 10 lt random 30 ]
```

```
cg  
pd  
repeat 1000 [ fd random 15 lt random 30 ]
```



```
cg  
setshape "girl  
setshape "boy
```

```
cg  
setshape "girl  
setshape "boy
```

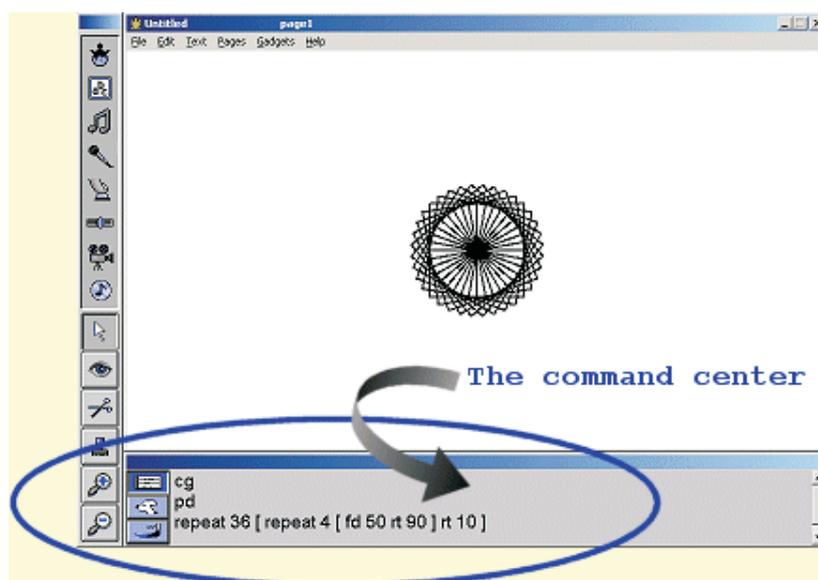


```
cg  
repeat 3 [ setshape "lion1 wait 10 setshape "lion2 wait 10 ]
```

```
cg  
repeat 3 [ setshape "lion1 wait 10 setshape "lio
```

Procedures

So far we have been typing commands one line at a time into the command center now we will look at typing commands into a procedure.

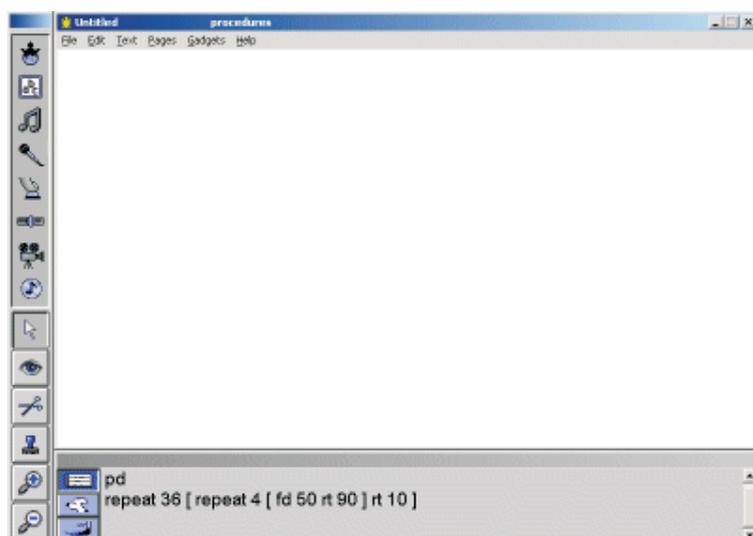
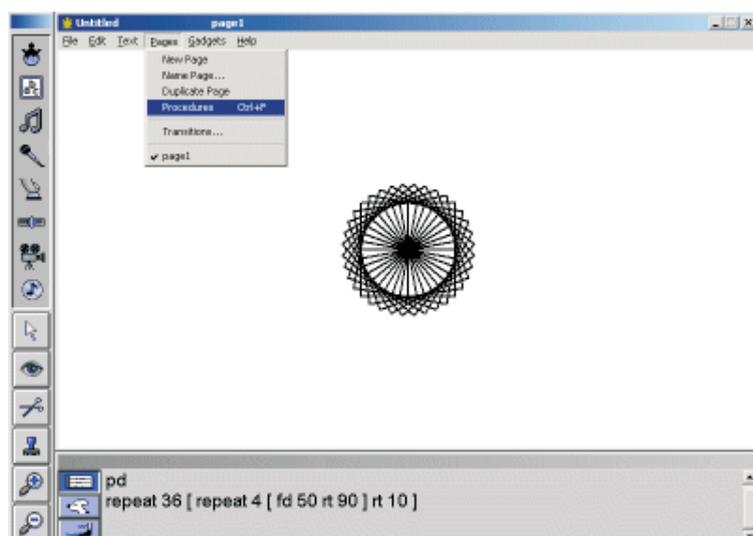


A procedure is a list of commands typed into the procedures page.

All procedures start with the word **to** and end with the word **end**.

Every procedure must have a unique name. eg **to circle**.

To switch to the procedures page select **Pages | Procedures** or use the keyboard shortcut **CTRL + F**

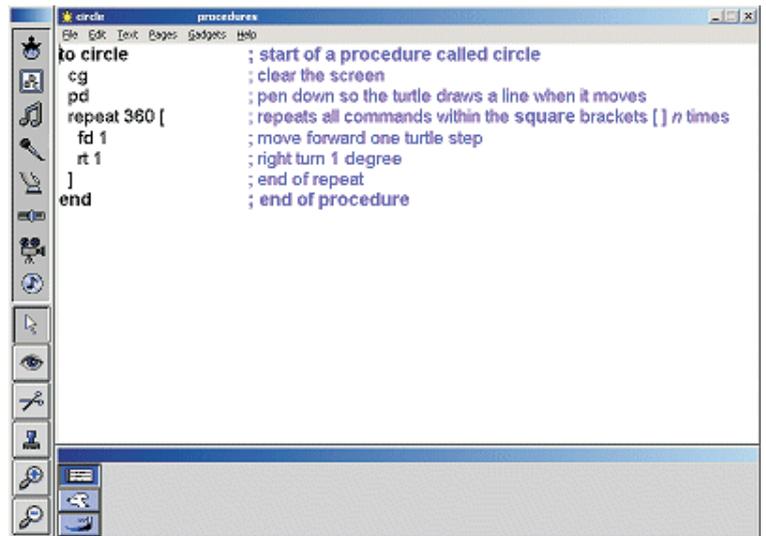


At first the procedures page will be blank

Copy a procedure from the example below or type your own.

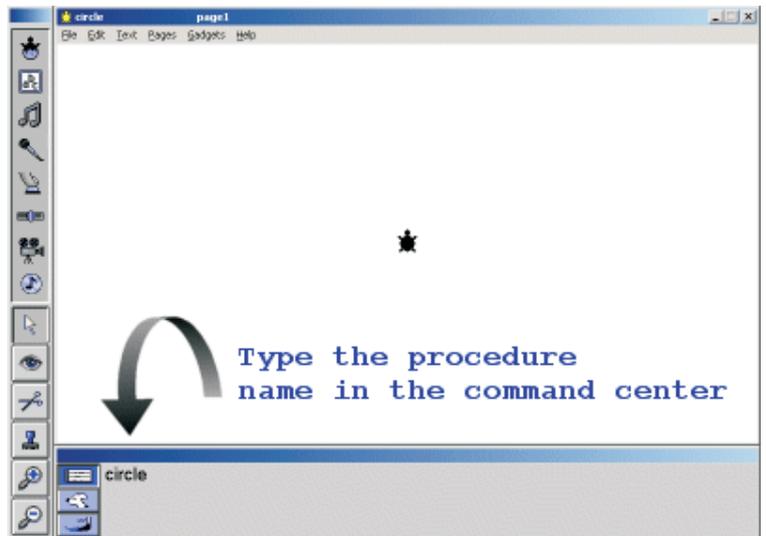
```

to circle      ; start of a procedure
                ; called circle
  repeat 360 [  ; repeats all commands
                ; within the square
                ; brackets [ ] n times
    fd 1        ; move forward one step
    rt 1        ; right turn 1 degree
  ]            ; end of repeat
end           ; end of procedure
  
```

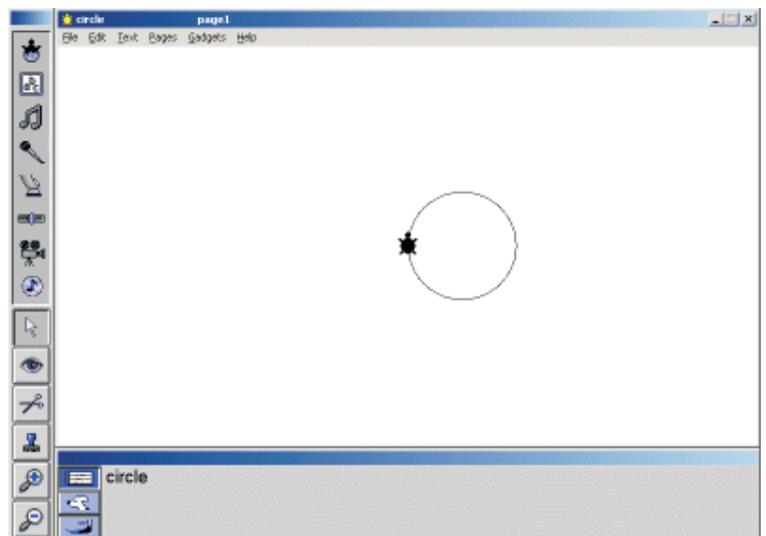


Now close the procedures page using the keyboard shortcut **CTRL + F**

Type the name of the procedure in the command center eg. **circle**.



circle



Procedures cont...

The power of procedures comes from using one procedure again and again.

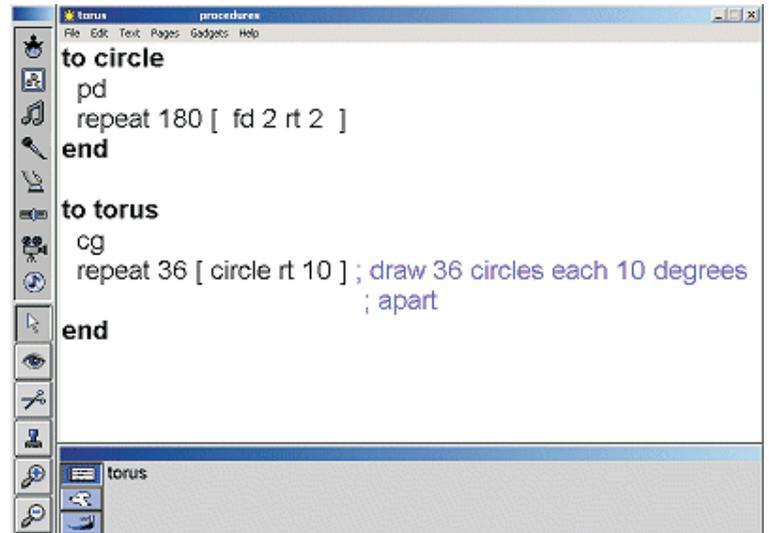
to circle

```
pd  
repeat 180 [ fd 2 rt 2 ]  
end
```

to torus

```
cg  
; draw 36 circles each 10 degrees apart  
repeat 36 [ circle rt 10 ]
```

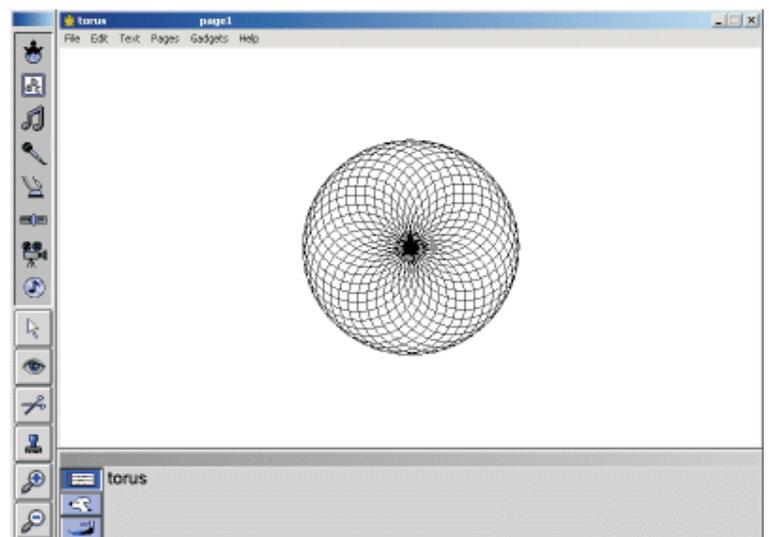
end



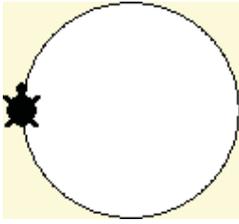
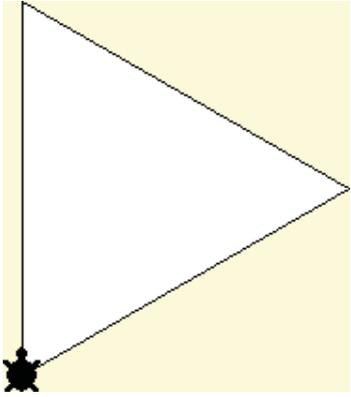
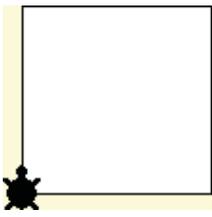
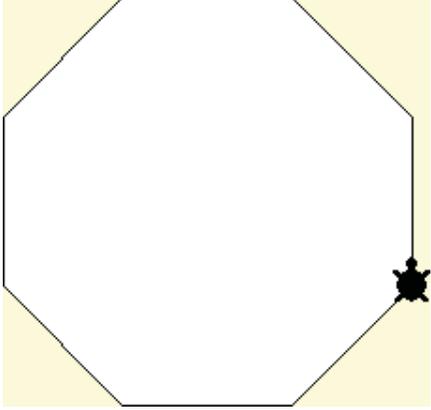
Now close the procedures page using the keyboard shortcut **CTRL + F**

Type the name of the procedure in the command center eg. **torus**

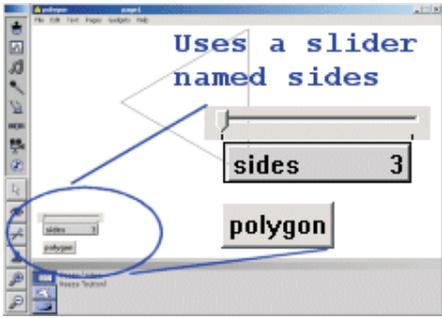
torus



Some shapes using procedures

	<pre> to circle ; start of a procedure ; called circle repeat 360 [; repeats all commands ; within the square ; brackets [] n times fd 1 ; move forward one step rt 1 ; right turn 1 degree] ; end of repeat end ; end of procedure </pre>
	<pre> to triangle ; start of procedure pd ; pen down repeat 3 [; repeats commands ; within the square ; brackets [] n times fd 200 ; move forward 200 steps rt 120 ; right turn 120 degree] ; end of repeat end ; end of procedure </pre>
	<pre> to square ; start of procedure pd ; pen down repeat 4 [; repeats commands ; within the square ; brackets [] n times fd 100 ; forward 100 steps rt 90 ; right turn 90 °] ; end of repeat end ; end of procedure </pre>
	<pre> to octagon ; start of procedure repeat 8 [; repeats commands ; within the square ; brackets [] n times fd 90 ; move forward 90 steps lt 360 / 8 ; left turn 360 ÷ 8 °] ; end of repeat end ; end of procedure </pre>

Sliders

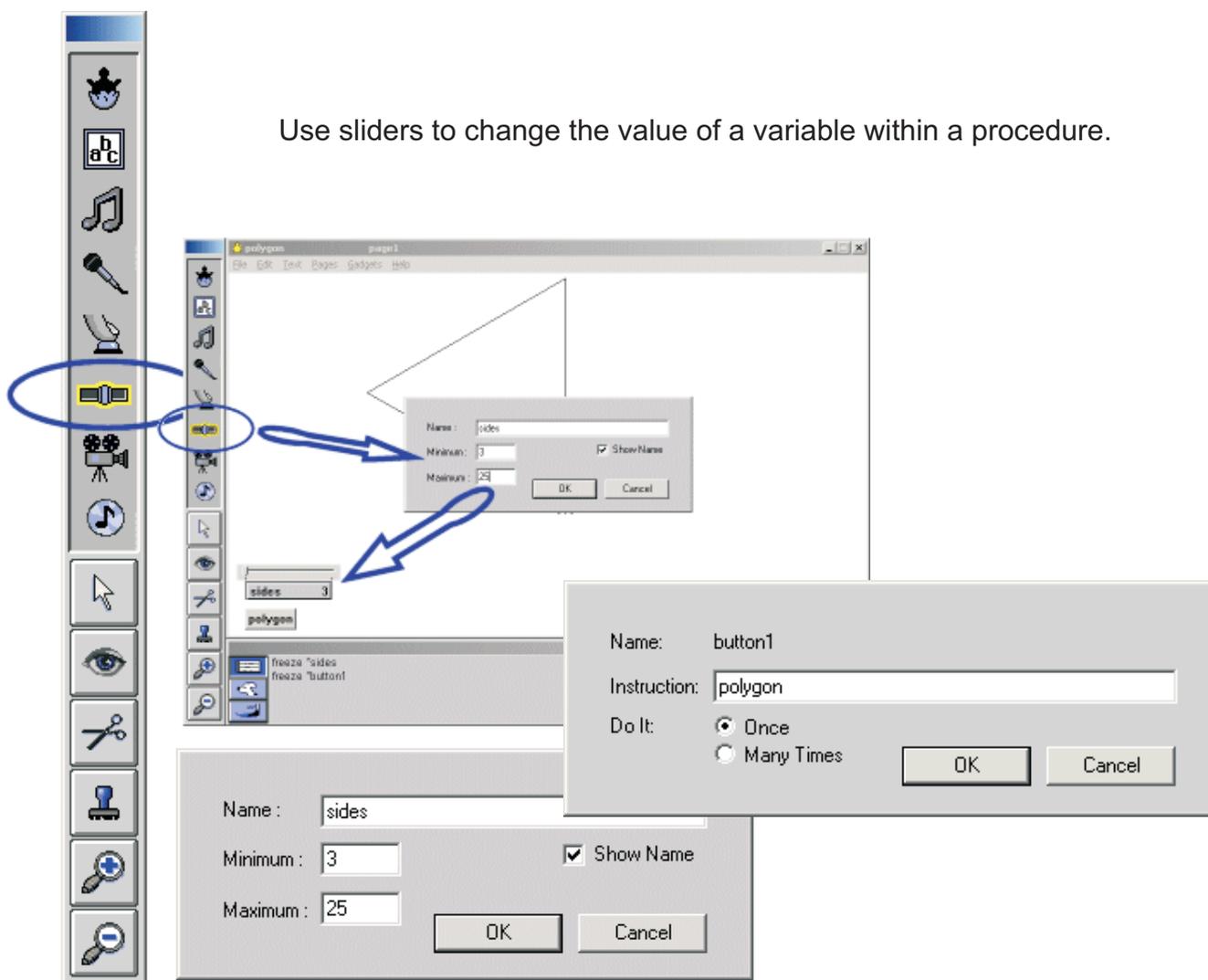


```

to polygon
  cg
  pu
  setpos [20 -60] ; move the turtle
  pd ; pen down
  repeat sides [ ; repeats sides times
    fd 800 / sides ; move 800 ÷ sides°
    lt 360 / sides ; lt 360 ÷ sides°
  ]
end ; end of procedure
        
```

Note this procedure uses a slider named sides to change the number of sides in the polygon.

Use sliders to change the value of a variable within a procedure.



APA citation:

Russell, R. (2003, October 27). *Microworlds intro*

Retrieved October 27, 2003, from

<http://uob-community.ballarat.edu.au/~rrussell/microworlds/index.html>