MAKING AN ANIMATION
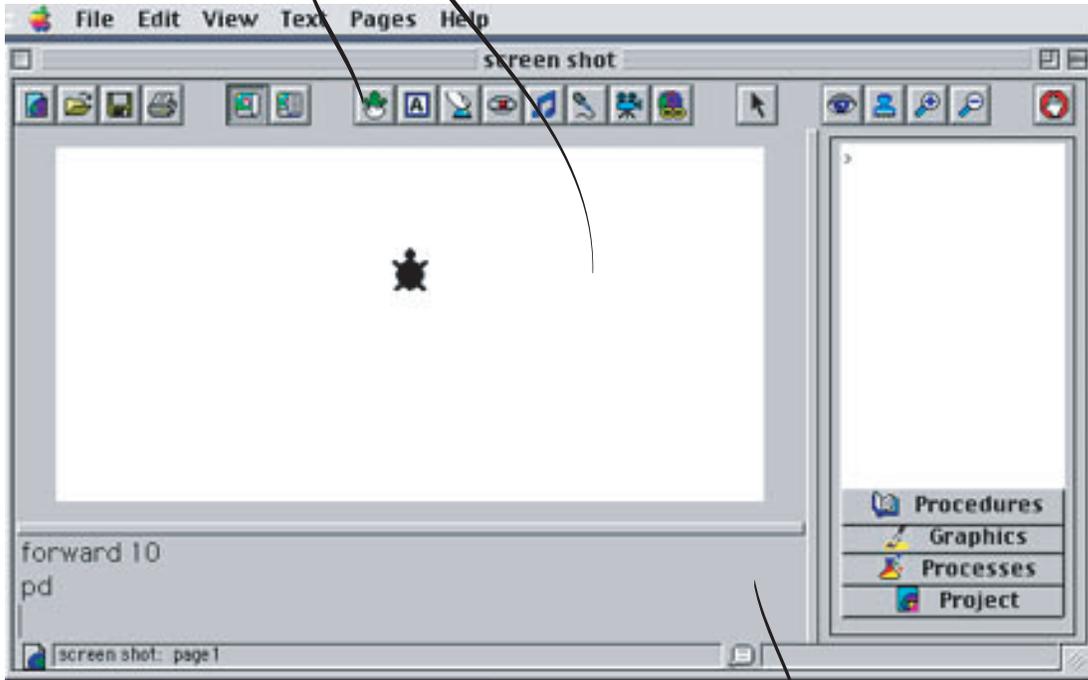# in MICROWORLDS PRO
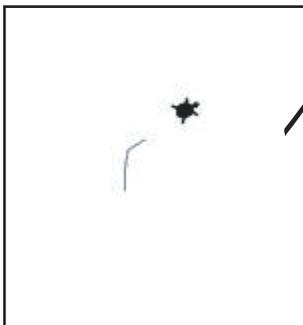
1

To create a turtle,
click first on this button and
then on the white background

```
File  Edit  View  Text  Pages  Help
```

screen shot

forward 10
pd

Procedures
Graphics
Processes
Project

screen shot: page1

2

Try these commands in the **command-center**
and see how the turtle moves on the screen

```
                    ; the turtle ...
                    ;
forward 20          ; moves 20 steps
pd                  ; puts its pen down
forward 20          ; draws a 20-step line
right 10            ; makes a 10-degree right-turn
forward 20          ; draws another 20-step line
right 45            ; makes a 45 degrees right-turn
forward 20          ; draw another 20-step line
pu                  ; lifts its pen
forward 50          ; moves another 50 steps
```

MAKING AN ANIMATION
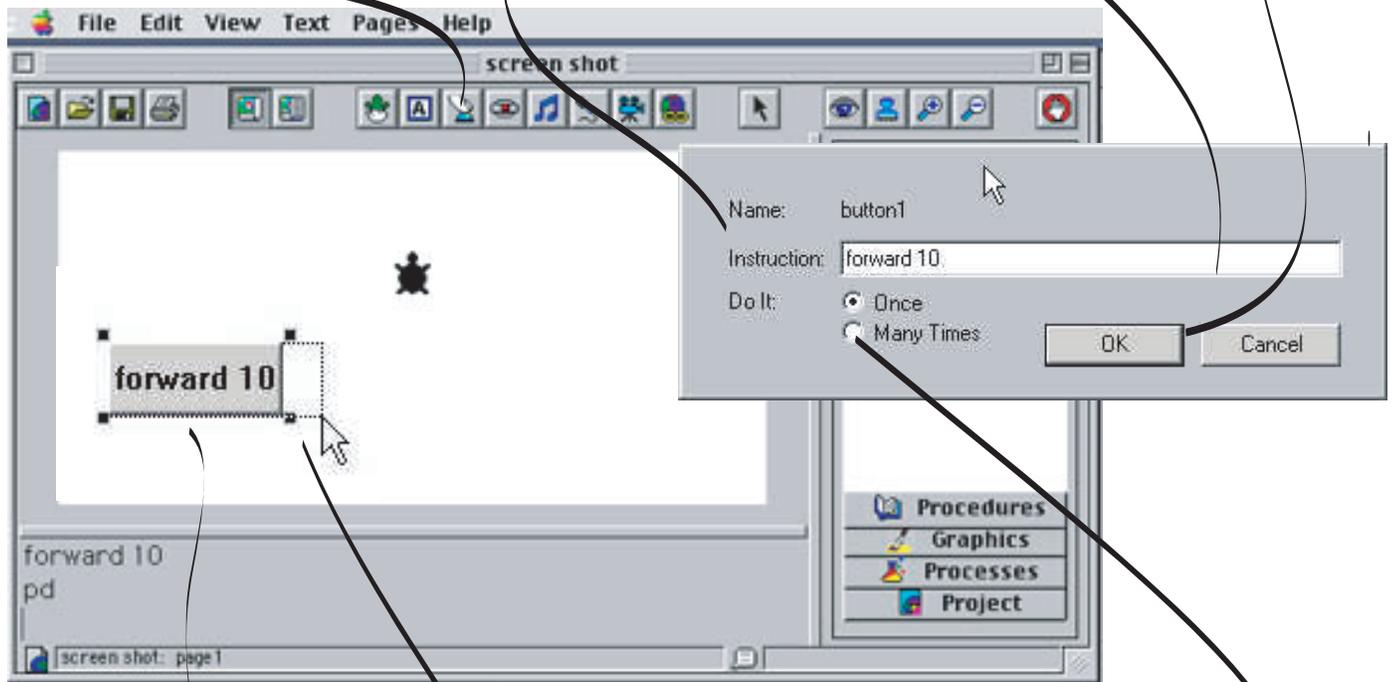# in MICROWORLDS PRO

3

You can also use **buttons** to give commands to the turtle.
To make a **button**,
click on this button. This dialog-box pops up.

4

Type **forward 10** for this button's instruction. Press OK.

File   Edit   View   Text   Pages   Help

screen shot

Name: button1

Instruction: forward 10

Do It: ○ Once
            ○ Many Times   OK   Cancel

forward 10

forward 10
pd

📁 Procedures
✏️ Graphics
🔬 Processes
🖼️ Project

screen shot: page 1

5

Hold the mouse down and drag a box around the button to select it. Resize it by dragging any of its corners.

6

Click on the button to see what happens. The turtle moves forward by 10 steps every time you click the button.

7

Select the button again and right click (or control-click if you are using a Mac) to get the dialog box again.

8

Select **Many Times** instead of **Once**. Press OK. Click on the button and see what happens.

9

What do you think would have happened if we had used **forward 5** instead of **forward 10**? Try it!

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(10)

Follow the steps on the previous page to make another button with the rule (instruction) **right random 30 left random 30.**

(11)

If you chose **Once** for the "Do It" option for the button, every time you press the button, the turtle turns right by a random amount (between 1 and 30 degrees) and then turns left by a random amount (between 1 and 30 degrees). The net effect is that it will sometime turn to the right and sometime to the left.

(12)

Now change the "Do It" option to **Many Times** and click on both buttons. The turtle now wonders around the screen, turning right by a small random amount as it moves forward.

(13)

You can change the shape of the turtle by putting a costume on it. In the shape editor, select the shape that you want by clicking on it and then click on your turtle. For this example, select the first bee shape.

NOTE:
Each image has a name and an ID. Roll the mouse over any image to see its name and ID. For example, the name of the first bee shape is bee1. Its ID is 32.

NOTE:
The command **right 90** will make the the turtle turn by 90 degrees underneath the costume, but the costume doesn't turn. In other words, you can change the direction of a turtle but its shape (except for the turtle shape) will not reflect this change.

(14)

Now click on your two buttons and watch the bee move around the screen. Now let's make it look like it is flying. We will use the two bee shapes to do this. We can do this by either creating another button or putting rules inside our turtle. Since we've already learned about buttons, let's do this by putting rules inside our turtle.

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(15) Try these commands in the **command-center** and see how the turtle moves on the screen. You can start with a new turtle if you wish.

; The turtle in a bee costume ..
setshape 32   ; change into the first bee costume
setshape 33   ; change into the second bee costume

NOTE: We could have used the shape names instead and the last two commands would become **setshape "bee1** and **setshape "bee2** respectively (see 17 below). Particularly note the use of single quotes to refer to the name of the costumes.
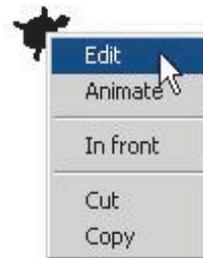
; Now do them back to back to make the wings flap
setshape 32 setshape 33
; But that was too fast to see the shape change. We cab slow it down a bit
; by waiting 1/10 of a second in between costume changes

setshape 32 wait 1 setshape 33
; Here is another way to slow things down:

setshape 32 forward 1 setshape 33
; It now moves and flaps its wings. If **forward 1** doesn't slow things enough,
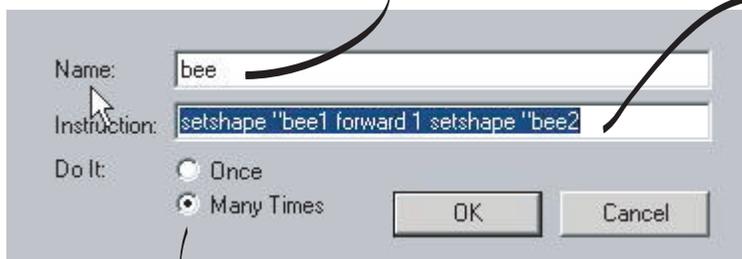; try bigger numbers.

(16)

Right click (Control click if you are using a Mac) on our turtle (who is now wearing the bee costume on) to give it a rule.

Edit
Animate
In front
Cut
Copy

(17)

Name the turtle **bee**.

Name:	bee
Instruction:	setshape "bee1 forward 1 setshape "bee2
Do It:	○ Once
	● Many Times OK Cancel

Type the commands -- that we just figured out for making the bee flap its wings -- for this turtle's instruction.

Chose **Many Times** for the "Do It" option. Press OK.

(18)

Click on your random turn button and the turtle. Your bee must now be flying around the screen.

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So far we have seen three ways to describe and influence what a turtle does:
We can talk to a turtle from the command-center; we can use buttons to talk to a turtle;
we can put commands inside a turtle and that are carried out every time we click on it.
We can also use colors in the background to influence what turtles do.

19) Use the drawing tools (in the graphics section)
to draw something; a flower for example.
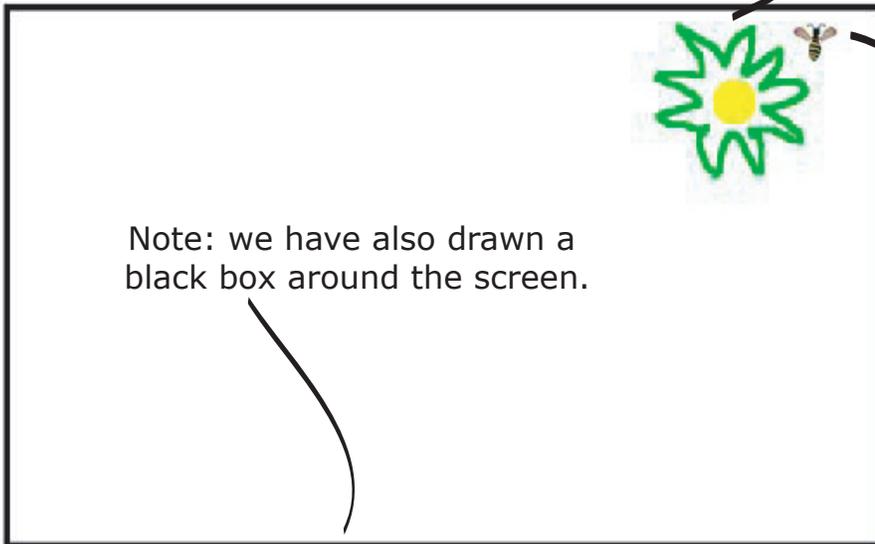
Note: we have also drawn a
black box around the screen.

Our turtle in its bee
costume is also shown.

20)

To add a rule to a color, use can either
right-click (control-click on Macs) on the color
in the graphics section or anywhere in the
background scene and select edit.
For example, use either of these methods
to give a rule to the color black.

Instructions for: black

Mouse:

Turtle: left (180 + random 50)
  ◉ Once ○ Each time   Cancel   OK
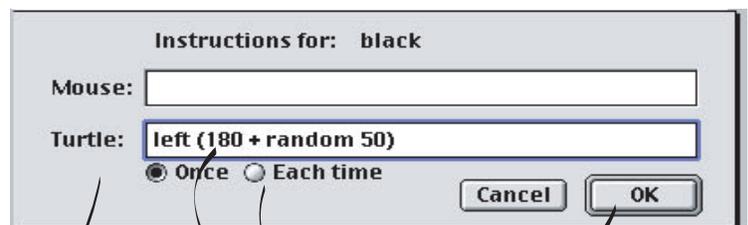
21) Type in **left (180 + random 50)**
for the turtle's rule.
Chose **Each Time**. Press OK.

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(22)

Now let's give a rule for the color **yellow**. Follow
steps 20 and 21 to add the rule **note 60 10** to color yellow.
The first number after **note** is the note number (60 corresponds
to the middle C), the second number is the note duration
in 1/10 of a second (so 10 means a second).

Select **Each Time** so that every time the bee goes over the
color yellow, the note middle C is played for a second.

NOTE: For more information on the command **note**, please
consult the online help that comes with Microworlds Pro.

(23)

Click on your turtle, click on both buttons, and watch your
bee fly around the screen and respond to colors when it
goes over them. Feel free to go back and change any
or all of the parameters and see what happens.

This was just a brief introduction; there are many more things
you can do in MicroWorlds. Please explore online documentations
and LCSI's site (http:// www.microworlds.com) for sample projects.