

**34. Comparisons**

true.false	word.or.list = word.or.list
true.false	number < number
true.false	number > number
true.false	<b>equal?</b> word.or.list word.or.list
true.false	<b>less?</b> number number
true.false	<b>greater?</b> number number

**35. Random Numbers**

number	<b>random</b> number
	<b>rerandom</b>

**36. Math Functions**

sine	<b>sin</b> number
cosine	<b>cos</b> number
tangent	<b>tan</b> number
arctangent	<b>arctan</b> number
square.root	<b>sqrt</b> number
number	<b>power</b> number number
exponential	<b>exp</b> number
natural.log	<b>ln</b> number
log.base.10	<b>log</b> number
integer.part	<b>int</b> number
num.rounded	<b>round</b> number

**37. Timer**

	<b>resett</b> (RESET Timer)
10ths.of.sec	<b>timer</b>
	<b>wait</b> 10ths.of.sec

**38. Interface with Excel**

	<b>openworksheet</b> path sheet
	<b>closeworksheet</b>
	<b>setcell</b> row column value
value	<b>getcell</b> row column

**39. Disk Access**

	<b>chdir</b> path (CChange DIRectory)
path	<b>currentdir</b>
dir.list	<b>directories</b>
file.list	<b>textlist</b>
file.list	<b>projectlist</b>
file.list	<b>pictlist</b>
file.list	<b>files</b> file.type
	<b>erfile</b> path (ERase FILE)

**40. Manual Memory Control**

free.space	<b>space</b>
	<b>recycle</b>

**41. Useful Words**

Some primitives can receive special words as inputs, here are some:

truth values	true, false
font styles	regular, bold, italic, underline
color names	black, blue, brown, cyan, gray, green, lime, magenta, orange, pink, red, yellow, turquoise, violet, white, sky
font names	Arial, [Courier New], [Times New Roman], [Comic Sans MS]
merge sources	procedures, pages, shapes
exporttext sources	cc, procedures
setinstrument names	piano, clarinet, guitar, violin, harpsichord, vibraphone, kalimba

**42. Object Properties**

The **set** and the **get** primitives need names of properties as inputs, here they are:

Project	presentationmode?, showtoolbar?, showcc?, showtabs?, showstatusbar?
Page	frozenbg?, transition, turtles, texts, buttons, sliders, melodies, sounds, music, hyperlinks, colordemons, frozenbg?, videos
Turtle	visible?, rule, on?, own, frozen?
Button	pos, size, rule, on?, frozen?
Slider	pos, showname?, limits, value, frozen?
Text	visible?, pos, size, transparent?, showname?, text, onreadline, frozen?
Color	turtlerule, turtlemode (once, eachtime), mouseclick
Hyperlink	visible?, pos, showname?, link, frozen?
Melody, Music, Sound, Video	visible?, pos, on?, showname?, frozen?
Melody	instrument, volume, tempo
announce, question	pos

**1. Turtle motion**

<b>forward</b>   <b>fd</b>	distance
<b>back</b>   <b>bk</b>	distance
<b>right</b>   <b>rt</b>	angle
<b>left</b>   <b>lt</b>	angle
<b>glide</b>	distance speed

**2. Absolute Positioning**

<b>setpos</b>	[x y]
<b>setx</b>	x.coordinate
<b>sety</b>	y.coordinate
<b>home</b>	

**3. Absolute Turning**

<b>setheading</b>   <b>seth</b>	absolute.angle
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**4. Motion and Turtle Information**

x.coordinate	<b>xcor</b>
y.coordinate	<b>ycor</b>
[x y]	<b>pos</b>
absolute.angle	<b>heading</b>
number	<b>distance</b> turtle.name
absolute.angle	<b>towards</b> turtle.name
true.false	<b>touching?</b> turtle.name turtle.name

**5. Pen Control**

	<b>pu</b> (Pen Up)
	<b>pd</b> (Pen Down)
	<b>setpensize</b> size
size	<b>pensize</b>

**6. Shapes**

shape.name	<b>setshape</b>   <b>setsh</b> name.or.number
	<b>shape</b>
	<b>stamp</b>
	<b>snapshot</b>
	<b>shaparea</b> shape [x y] [xsize ysize]
size	<b>setsize</b> size
	<b>size</b>
	<b>saveshape</b> path number
	<b>loadshape</b> path number

**7. Colors**

	<b>setcolor</b>   <b>setc</b> name.or.number
number	<b>color</b>
number	<b>setbg</b> background.color
	<b>bg</b>
color.number	<b>colorunder</b>

**8. Other Turtle Actions**

	<b>cg</b> (Clear Graphics)
	<b>clean</b>
	<b>infront</b>
	<b>fill</b>
	<b>turtlesown</b> var.name
	<b>ht</b> (Hide Turtle)
	<b>st</b> (Show Turtle)

**9. Graphics Page Control**

	<b>newpage</b>
	<b>namepage</b>   <b>np</b> name
	<b>getpage</b> page.name
	<b>freezebg</b> (FREEZE BackGround)
	<b>unfreezebg</b>
	<b>newprojectsize</b> [xsize ysize]
[xsize ysize]	<b>projectsize</b>
	<b>snapshot</b>
	<b>restore</b>
	<b>savepict</b> path
	<b>loadpict</b> path
	<b>placepict</b> path [x y] [xsize ysize]
	<b>presentationmode</b>
list.of.pages	<b>pagelist</b>

**10. Objects in Page**

	<b>newturtle</b> name
	<b>newtext</b> name [x y] [xsize ysize]
	<b>newbutton</b> name [x y] instruction.list
	<b>newslicer</b> name [x y] [min max now]
	<b>remove</b> name
	<b>set</b> object property value
prop.value	<b>get</b> object property
	<b>freeze</b> object.name
	<b>unfreeze</b> object.name

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11. Project Control

	<b>getproject</b> path
	<b>saveproject</b>
	<b>procedures</b>
	<b>setfooter</b> word.or.list
	<b>merge</b> path word.source
	<b>exporttext</b> path word.source
	<b>importtext</b> path text.name
	<b>createprojectvar</b> word.or.list
list.of.vars	<b>projectvars</b>

12. Examples of Words & Lists

word	"mama
word	"Mama&Papa
word	"\I mama and papa \
word	"C:\projects\farm
word	"
word	12345
word	-1.2E+10
list	[mama and papa are 2]
list	[]
list	[[mama 30] [papa 32]]

13. Word & List Composition

new.word	<b>word</b> word1 word2
new.list	<b>list</b> list1 list2
new.list	<b>sentence</b>   <b>se</b> list1 list2
list	<b>fput</b> word.or.list list
list	<b>lput</b> word.or.list list
list	<b>parse</b> word

14. Parts of Words & Lists

word.or.list	<b>first</b> word.or.list
word.or.list	<b>last</b> word.or.list
list	<b>butfirst</b>   <b>bf</b> word.or.list
list	<b>butlast</b>   <b>bl</b> word.or.list
word.or.list	<b>item</b> number word.or.list
word.or.list	<b>pick</b> word.or.list

15. Word & List Information

number	<b>count</b> word.or.list
true.false	<b>empty?</b> word.or.list
true.false	<b>word?</b> word.or.list
true.false	<b>list?</b> word.or.list
true.false	<b>member?</b> word.or.list
true.false	<b>number?</b> word.or.list
true.false	<b>identical?</b> word.or.list word.or.list
ascii.number	<b>ascii</b> char
char	<b>char</b> ascii.number

16. TextBoxes

	<b>print</b>   <b>pr</b> word.or.list
	<b>insert</b> word.or.list
	<b>cleartext</b>   <b>ct</b>
	<b>delete</b>
	<b>transparent</b> textbox.name
	<b>opaque</b> textbox.name
	<b>stamptext</b> textbox.name
	<b>hidetext</b>
	<b>showtext</b>
	<b>textitem</b> line.number textbox.name
	<b>textpick</b> textbox.name
	<b>textcount</b> textbox.name
	<b>savetext</b> path
	<b>loadtext</b> path

17. TextBoxes and Clipboard

	<b>select</b>
	<b>unselect</b>
word	<b>selected</b>
	<b>cut</b>
	<b>copy</b>
	<b>paste</b>
word	<b>clipboard</b>

18. Moving in a TextBox

	<b>search</b> word
	<b>sol</b> (Start Of Line)
	<b>eol</b> (End Of Line)
	<b>cf</b> (Cursor Forward)
	<b>cb</b> (Cursor Back)
	<b>cu</b> (Cursor Up)
	<b>cd</b> (Cursor Down)
	<b>top</b>
	<b>bottom</b>
true.false	<b>found?</b>
true.false	<b>eot?</b> (End Of Text?)

19. Fonts, Styles & Colors

	<b>setfont</b> word.font.name
	<b>setstyle</b> word.font.style
number	<b>setfontsize</b> number
	<b>fontsize</b>
	<b>settc</b> name.or.number
color.number	<b>tc</b> (Text Color)

20. Command Center

	<b>show</b> word.or.list
	<b>cc</b> (Clear Commands)

21. Pop-up Dialogs

	<b>question</b> word.or.list
	<b>announce</b> word.or.list

22. Keyboard & Mouse Input

char	<b>readchar</b>
true.false	<b>key?</b>
word	<b>answer</b>
	<b>onreadline</b> textbox.name instruction
[x y]	<b>mousepos</b>

23. Sound & Video

	<b>note</b> num.or.list duration
	<b>rest</b> duration
	<b>setinstrument</b> name.or.number
	<b>resetvideo</b> name

24. Addressing Instructions

	<b>ask</b> who instruction.list
	<b>talkto</b> turtle.or.list
	<b>talkto</b> textbox
	<b>listen</b>
	<b>everyone</b> instruction.list
current.textbox	<b>textwho</b>
current.turtle	<b>who</b>

25. Variables

	<b>make</b> var.name value
	<b>name</b> value var.name
value	<b>thing</b> name
	<b>local</b> var.name
	<b>let</b> list.of.names.and.vals
true.false	<b>name?</b> word
list.of.vars	<b>names</b>
	<b>cleurname</b> word
	<b>clearnings</b>

26. Procedures

	<b>to</b> proc.name :input1 :input2
	<b>end</b>
	<b>output</b>   <b>op</b> proc.output
	<b>stop</b>

27. Error Handling

	<b>carefully</b> instruction.list aux.list
error.as.word	<b>errormessage</b>

28. Conditional Actions

	<b>if</b> condition instruction.list
	<b>ifelse</b> condition if.list else.list
true.false	<b>and</b> true.false true.false
true.false	<b>or</b> true.false true.false
true.false	<b>not</b> true.false

29. Sequential Repetition

	<b>repeat</b> number instruction.list
	<b>dolist</b> [var.name [list]] instruction.list
	<b>dotimes</b> [var.name num] instruction.list
	<b>run</b> instruction.list

30. Launching processes

	<b>forever</b> instruction.list
	<b>when</b> condition instruction.list
	<b>launch</b> instruction.list
	<b>setinstruction</b> instruction.list
	<b>clickon</b>

31. Stopping processes

	<b>stopall</b>
	<b>cancel</b> instruction.list
	<b>stopme</b>
	<b>waituntil</b> condition
	<b>clickoff</b>

32. Process Inspection

true.false	<b>done?</b> instruction.list
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33. Arithmetic

sum	number	<b>+</b>	number
difference	number	<b>-</b>	number
product	number	<b>*</b>	number
quotient	number	<b>/</b>	number
minus	-number		
sum	number	<b>sum</b>	number number
difference	number	<b>difference</b>	number number
product	number	<b>product</b>	number number
quotient	number	<b>quotient</b>	number number
minus	number	<b>minus</b>	number
remainder	number	<b>remainder</b>	number number
absolute.value	abs	<b>abs</b>	number
3.14159	<b>pi</b>		