# Reference — pencilcode.net

## Movement

| | |
|---|---|
| `fd 50` | forward 50 pixels |
| `bk 10` | backward 10 pixels |
| `rt 90` | turn right 90 degrees |
| `lt 120` | turn left 120 degrees |
| `rt 90, 50` | do a 90° arc of radius 50 |
| `home()` | go to the page center |
| `slide x, y` | slide right x and forward y |
| `moveto x, y` | go to x, y relative to home |
| `turnto 45` | set direction to 45 (NE) |
| `turnto obj` | point toward obj |
| `speed 30` | do 30 moves per second |

## Appearance

| | |
|---|---|
| `ht()` | hide the turtle |
| `st()` | show the turtle |
| `scale 8` | do everything 8x bigger |
| `wear yellow` | wear a yellow shell |
| `fadeOut()` | fade and hide the turtle |
| `remove()` | totally remove the turtle |

## Output

| | |
|---|---|
| `see obj` | debug the value of obj |
| `write 'hello'` | writes a line of HTML |
| `p = write 'hm'` | saves an HTML element |
| `p.html 'done'` | changes old text |
| `append 'ok'` | text without a new line |
| `button 'go', -> fd 10` | adds a button with an action |
| `read (n) ->  write n*n` | adds a text input with an action |
| `t = table 3,5` | adds a 3x5 <table> |
| `t.cell(0, 0). text 'aloha'` | selects the first cell of the table and sets its text |
| `ct()` | clear text |

## Drawing

| | |
|---|---|
| `pen blue` | draw in blue |
| `pen red, 9` | 9 pixel wide red pen |
| `pen null` | use no color |
| `pen off` | pause use of the pen |
| `pen on` | use the pen again |
| `label 'X'` | draw the letter X |
| `dot green` | draw a green dot |
| `dot gold, 30` | 30 pixel gold circle |
| `pen path` | trace an invisible path |
| `fill cyan` | fill traced path in cyan |
| `cg()` | clear graphics |

## Properties

| | |
|---|---|
| `turtle` | name of the main turtle |
| `getxy()` | [x, y] position relative to home |
| `direction()` | direction of turtle |
| `hidden()` | if the turtle is hidden |
| `touches(obj)` | if the turtle touches obj |
| `inside(window)` | if enclosed in the window |

## Sets

| | |
|---|---|
| `g = hatch 20` | hatch 20 new turtles |
| `g = $('img')` | select all <img> as a set |
| `g.plan (j) ->` | direct the jth turtle to go |
| `@fd j * 10` | forward by 10j pixels |

## Other Functions

| | |
|---|---|
| `tick 5, -> fd 10` | go 5 times per second |
| `click -> fd 10` | go when clicked |
| `random [3,5,7]` | return 3, 5, or 7 |
| `random 100` | random [0..99] |
| `play 'ceg'` | play musical notes |
| `$(window)` | the visible window |
| `$('p').eq(0)` | the first <p> element |
| `$('#zed')` | the element with id="zed" |

## Colors

| | | | | | | |
|---|---|---|---|---|---|---|
| white | gainsboro | silver | darkgray | gray | dimgray | black |
| whitesmoke | lightgray | lightcoral | rosybrown | indianred | red | maroon |
| snow | mistyrose | salmon | orangered | chocolate | brown | darkred |
| seashell | peachpuff | tomato | darkorange | peru | firebrick | olive |
| linen | bisque | darksalmon | orange | goldenrod | sienna | darkolivegreen |
| oldlace | antiquewhite | coral | gold | limegreen | saddlebrown | darkgreen |
| floralwhite | navajowhite | lightsalmon | darkkhaki | lime | darkgoldenrod | green |
| cornsilk | blanchedalmond | sandybrown | yellow | mediumseagreen | olivedrab | forestgreen |
| ivory | papayawhip | burlywood | yellowgreen | springgreen | seagreen | darkslategray |
| beige | moccasin | tan | chartreuse | mediumspringgreen | lightseagreen | teal |
| lightyellow | wheat | khaki | lawngreen | aqua | darkturquoise | darkcyan |
| lightgoldenrodyellow | lemonchiffon | greenyellow | darkseagreen | cyan | deepskyblue | midnightblue |
| honeydew | palegoldenrod | lightgreen | mediumaquamarine | cadetblue | steelblue | navy |
| mintcream | palegreen | skyblue | turquoise | dodgerblue | blue | darkblue |
| azure | aquamarine | lightskyblue | mediumturquoise | lightslategray | blueviolet | mediumblue |
| lightcyan | paleturquoise | lightsteelblue | cornflowerblue | slategray | darkorchid | darkslateblue |
| aliceblue | powderblue | thistle | mediumslateblue | royalblue | fuchsia | indigo |
| ghostwhite | lightblue | plum | mediumpurple | slateblue | magenta | darkviolet |
| lavender | pink | violet | orchid | mediumorchid | mediumvioletred | purple |
| lavenderblush | lightpink | hotpink | palevioletred | deeppink | crimson | darkmagenta |