

DYNA DRAW 3D INSTRUCTIONS

This dynamic drawing tool will have you creating wild and crazy scenes that you will love to share with others. The single letter programming commands are like the LOGO Turtle graphics of 'old' and a great educational platform for 3 dimensional special concepts and programming.

You can share with anyone on any platform including smart phones and tables, but if you want to roll up your sleeves and create your own, a keyboard is needed.

Happy Drawing!

SINGLE LETTER MOTION & ROTATION

The first command you should learn is 'f' which draws a short line forward. If you enter more than one 'f' the line gets longer, 'ffff' is four times as long. If you use a capital 'F', the line dynamically grows and shrinks in both directions.

f/F: Line Forward

This is a special command because it actually draws something on the screen. The only other commands that draw on the screen are the **3D Object** commands, for example **<World>**, or **<Smoke>**.

All the other commands will give you control over the position, rotation, size, and color of your creation.

Some special commands let you interact with your creation by aiming and shooting cannon balls.

Some really special commands give you programmatic type controls of your drawing scripts, to create your own functions, encapsulate transforms, and make repetitive scripts easier.

#' s: as a multiplier (Maximum 25)

#'s Give a multiplier to a single letter command. For example, 5f is the same as 'fffff', 6r is a 90 ° turn!

Note, this also works with all step and dynamic rotate commands as well as c (copy), and z (zoom)

2D - Lower case, single step, upper case dynamic motion/rotation

	m/M: Move forward	
r/R: Rotate Right 15 °		l/L: Rotate Left 15 °
	b/B: Move Back	

3D - Lower case, single step, upper case dynamic rotation

	u/U: Rotate Up 15 °	
o/O: Rotate Out – spin clockwise 15 °		i/I: Rotate In – spin counter-clock wise 15 °
	d/D: Rotate Down 15 °	

3D OBJECTS TO ADD TO YOUR SCENE

- **<World>** **<Sword>** **<Asteroid>** **<Rocket>** **<Disk>** **<Torus>**
- Lights: **<Point>** **<Spot>** for a point light or a spotlight.
- Drawing **<Smoke>** must be placed somewhere that is moving. It will leave a smoke trail behind.
- **" "**: Quotes. Any letters (or space character) inside quotes will be drawn as 3D characters.

OBJECTS THAT ADD INTERACTION

Keyboard, Gamepad & Onscreen controls will control the angle & shooting

- **<Shoot>**: Shoots a cannon ball
- **<Tilt>**: Tilter
- **<Atilt>**: Tilter, but in the opposite direction

COMMANDS TO ADD PIZZAZ

- **z**: Zoom Smaller, **Z**: Zoom Larger
- **C**: Dynamic Rotate colors of anything drawn after this – “Taste the Rainbow!”
- **<Color (C)>**: Same as the above single letter ‘C’ command.
- **<Color (1)>**: Set a specific color:
0: black, 1: white, 2: red, 3: green, 4: blue, 5: yellow, 6: magenta, 7: cyan, 8: gray, 9: clear

SPECIAL PROGRAMMING COMMANDS

- **() c**: Copy stuff found in last (...), example: **(fr) cccc**

You can also have copies inside copies: **((6r5f) ccc6r) ccc**

- **[]**: Branch. Any motion/rotation or zooms set inside the brackets are reset to where they started at the beginning of the branch. This is nice for branching from the same point
Example: **ffff[Rffff][Lffff]**, both arms start from the same point. You can do branches inside branches as well.
- **< >**: Create and use your own functions

Create Function – X gets replaced	Use Your Function	Results
<rightbend=ffrrffrr>	<rightbend>	ffrrffrr
<square()=(Xf6r)ccc>	<square(3)>	(3f6r)ccc
<rotdisk()=XI<Disk>>	<rotdisk(6)>	6I<Disk>
<say()=6r6b"X">	<say(Hi)>	6r6b"Hi"

Note that when you create a function that the capital letter ‘X’ it will be replaced with whatever you pass in the parentheses (). You can pass multiplier #'s, Text for 3D Text, a 3D object like **<Disk>**, or even call a function inside a function. A function can even call itself, for some cool recursion!