

Wizards of Wright

Cube-lets Explanation Sheet

Action Cubes

Bar Graph Cube-let - It displays the block's value as a light-up bar graph. The value is normalized to the number of points on the bar graph so that a maximum value results in a fully-lit bar graph.



Drive Cube-let - It is a block with wheels for driving around on flat surfaces. The Drive Cube-let only moves in one direction, slowing to a stop with a value of zero and moving faster with higher input values.



Flashlight Cube-let - It emits a focused beam of light from a powerful white LED. Off with a value of 0, the light becomes brighter with higher input values.



Rotate Cube-let - One face spins at a rate corresponding to the block's input values.



Speaker Cube-let - It is great for building noisy robots. It chirps according to the block's data value. Contains a small speaker and an amplifier.



Sense Cubes

Brightness Cube-let – It reads the amount of available light hitting its sensor. The Brightness Cube-let has an analog photocell that responds to varying light conditions. Expect values near zero in a dark room, and values near one when the sensor is in front of a bright light.



Distance Cube-let – It senses how far it is from an object. It uses infrared light and is accurate between 10 and 80 cm. The sensor is directional, so it outputs the distance to the object in front of the sensor. At 10cm, the block will output values near 1, and toward 80cm it will output values near 0.



Knob Cube-let - It has a potentiometer embedded in one of its faces. It outputs a 0 when turned fully counterclockwise, and a 1 when turned clockwise.



Temperature Cube-let - It contains a tiny thermometer (actually, a thermistor) that detects temperature. It's calibrated to output a 0 in freezing conditions and 255 in hot, sunny conditions of about 35C.



Logic Cubes



The **Passive** (light green) Cube-let transmits power and data just like a wire, but doesn't do anything. It carries power and data from its neighbors, but it basically acts like a smart brick. It doesn't move, sense, or change the data in any way.



The **Blocker** (dark green) Cube-let is a data barrier. It "blocks" data from its neighbors. It still passes power, but effectively stops communication and can insulate one side of a robot from another.



The **Inverse** (red) Cube-let flips the value. It calculates a value that is the opposite of the values it receives. The Inverse Cube-let will (weighted) average its inputs and then output a value of one minus that average.



The **Maximum** (dark brown) Cube-let will filter out the highest value. It accepts many different inputs but only passes along the one with the greatest value. With a maximum block, you could easily build a robot that performs an action only when a sensor reads a value over a certain threshold (set by a Knob Cubelet, perhaps).



The **Minimum** (light brown) Cube-let outputs the minimum input value that it receives. It can accept any amount of data but only outputs the smallest value that it receives. It can be handy for creating an on-off switch for a robot and also for using with a Distance Cube-let to build robots that avoid falling off the edge of a table.



The **Threshold** (orange) Cube-let is a THINK Cube-let with a knob to alter the behavior of your robots. It will output a value of zero until its inputs exceed the threshold set by the knob. Above this threshold data will flow normally. Use this Cube-let to create robots that react suddenly, gate data flow, or exhibit binary behavior.