









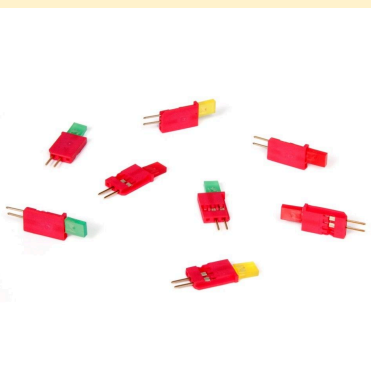
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W2: CIM Introduction to the VEX® V5Robotics Platform

Summarize each of the components by reviewing the [VEX V5 Store](#). Write down the name of each component and explain what are the programming requirements for each component.

	Cost	Name (Brain, Motors, and Sensor)	Image-Submit a screenshot of each of the components.	Description: What are the specifications of the component? What does this component do? How would you use it? Does the equipment have a specific programming requirement?
0	\$374.99	V5 Robot Brain		The Vex V5 robot brain has 21 Smart ports, 8 3-wire ports, a Cortex A9 at 667MHz, two Cortex M0 at 32MHz each, and one FFGA dedicated to screen input, refreshing, and timers. The Vex V5 brain was designed to the heart of any robot, you can code programs for it in Vex Code, Python, or C++.
1	\$48,39 + \$12.89 (cartridge)	Smart Motor		The V5 Smart Motor interfaces directly with the Vex V5 brain through a smart write plugged one end into the motor and the other into a smart port of the brain. Depending on the cartridge, the motor will have different gear ratios (36:1, 18:1, 6:1), these ratios in turn affect the RPM and torque of the motor. Motors are used to

				drive things, such as arms or wheels.
2	\$24.79	Servo Motor		The 3-wire Servo is a motor that can be directed to turn to face a specific direction, rather than just spin forward or backward. It's important to note that Vex intended newer builds to use a V5 Smart Motor to act as a servo, but the smart motor lacked a neutral reference (this means on each startup, the Vex V5 motor would redefine what 0 degrees looked like).
3	\$49.69	Optical Sensor		The Optical Sensor is a RGB, hue, and saturation sensor. Color detection works best at 100mm and less. This is best used in autonomous programming, this one best used for finding specific colored objects.
4	\$49.69	Distance Sensor		The distance sensor measures the distance of an object, and has a range of 20mm to 2000mm. The approximate object will also be reported as small, medium, or large. Similar to the optical sensor, this will be best used in autonomous mode, this one best used for measuring the distance and driving.

5	\$42.99	Rotation Sensor		The rotation sensor measures shaft rotational position, total rotations, and rotations speed. This sensor is likely best used for odometry, estimating the total distance something has moved, though it's important to note that the Vex V5 Smart motors have their own rotation sensors built in.
6	\$15.49	Limit Switch		This switch is suited for detecting subtle events, such as robot arms maxing out. Additionally, these make for excellent kill switches.
7	\$15.49	Bump Switch		These switches require more force than the limit switch, they are better suited for user input.
8	\$11.89	LED		These are indicators, could be helpful for information or debugging purposes.

9	\$92.69	Vision Sensor		This AI vision sensor is an advanced optical sensor designed for object recognition. It can recognize color blobs (up to 7 at once), it can recognize basic shapes, and can recognize any game object from a Vex V5 competition starting 2024-2025. This sensor is best used in autonomous programming for recognizing objects to interact with.
10	\$53.99	Inertial Sensor		This sensor combines a 3-axis accelerometer and gyroscope. This sensor is best used in autonomous programming for odometry and precise movements.
11	\$205.99	GPS Sensor		This “Game Positioning System” is used for determining the robot’s precise position on a field at any times, and can be used to direct the robot to move to a specific coordinate.