Robotics

Full range of Robotic products available at:

www.rapidonline.com

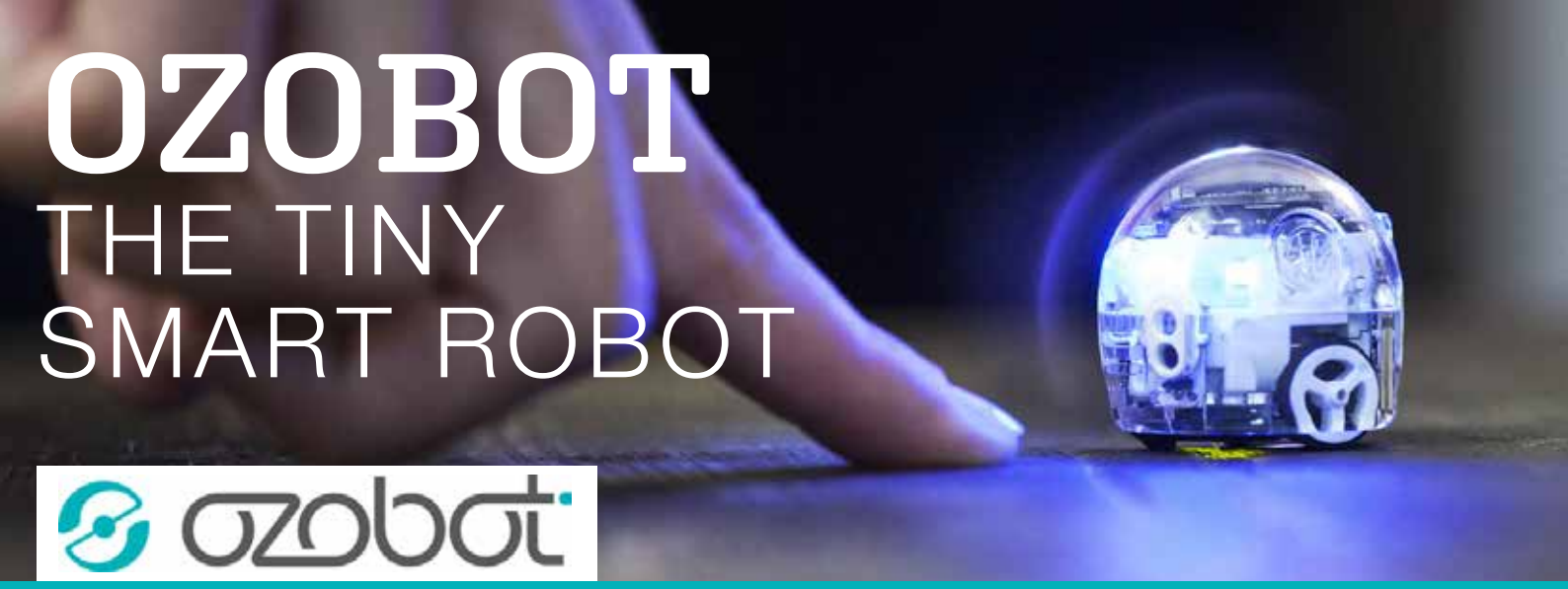
ROBOTICS GUIDE



	The Robot	Product Code	Description	The Brand	Assembly Required	Tools That May Be Helpful	Soldering Required	
Ready to Go Robot	VEX 123!	70-6250	See page 70	VEX	No		✘	
	Dot	70-1101	See page 63	Wonder Workshop	No		✘	
	Dash	70-1100	See page 63	Wonder Workshop	No		✘	
	Cue	70-1108	See page 63	Wonder Workshop	No		✘	
	Codey Rocky	75-0516	See page 58	Makeblock	No		✘	
	Ozobot	70-8200	See page 58	Ozobot	No		✘	
	Ohbot	76-0000	See website	Ohbot	No		✘	
Humanoid Robots	NAO	70-8893	See page 67	SoftBank Robotics	No		✘	
	Pepper	70-8870	See page 67	SoftBank Robotics	No		✘	
Robotic Kits	Ohbot	76-0001	See website	Ohbot	Assembly is part of the fun & learning!		✘	
	FABLE	00-0408	See website	Shape Robotics	Assembly is part of the fun & learning!		✘	
	VEX GO!	70-6311	See page 70	VEX	Assembly is part of the fun & learning!		✘	
	VEX IQ	70-7891	See page 71	VEX	Assembly is part of the fun & learning!		✘	
	VEX V5	70-8194	See page 71	VEX	Assembly is part of the fun & learning!		✘	
	MakeBlock mBot	75-0701	See page 59	Makeblock	Assembly is part of the fun & learning!		✘	
	mBot Ranger	75-0699	See page 59	Makeblock	Assembly is part of the fun & learning!		✘	
	Line Tracking Mouse	13-1035	See page 82	CIC	Assembly is part of the fun & learning!	Soldering Iron, Solder Wire, Needle-nose Pliars, Side Cutter, Screwdriver Set	✔	
	Line Tracking Robot	06-9348	See page 82	CIC	Assembly is part of the fun & learning!	Screwdriver Set	✘	
	Sound Reversing Car Kit	13-1030	See page 82	CIC	Assembly is part of the fun & learning!	Soldering Iron, Solder Wire, Long Nose Pliars, Diagonal Cutter, Screwdriver, AA Batteries	✔	
	Follow Me Robot	06-9347	See page 82	CIC	Assembly is part of the fun & learning!	Soldering Iron, Solder Wire, Long Nose Pliars, Diagonal Cutter, Screwdriver, AA Batteries	✔	
	Escape Robot Kit	13-1090	See page 82	CIC	Assembly is part of the fun & learning!	Soldering Iron, Solder Wire, Long Nose Pliars, Diagonal Cutter, Screwdriver, AA Batteries	✔	
	Robot Duck	13-0884	See page 82	Rapid	Assembly is part of the fun & learning!	Screwdriver, Small Pliars	✘	
	Jitterbugs	13-0790	See page 82	TEP	Assembly is part of the fun & learning!	Screwdriver, Small Pliars	✘	
	Skywalker Walking Robot	64-0753	See website	Arexx	Soldering Required	Soldering Iron, Solder Wire, Long Nose Pliars, Diagonal Cutter, Screwdriver	✔	
	Skywalker Walking Robot	64-0751	See website	Arexx	Assembled		✘	
	HexBugs	51-2267	See website	VEX HEXBUG	Assembled		✘	
	Football Robot Kit	64-0748	See website	Arexx	Assembly is part of the fun & learning!	Small Hammer, Screwdriver Set, Long-nose pliars	✘	
	HEXBUG Catapult	70-0395	See website	VEX HEXBUG	Assembly is part of the fun & learning!		✘	
	HEXBUG Crossbow	70-0394	See website	VEX HEXBUG	Assembly is part of the fun & learning!		✘	
	HEXBUG Fork Lift Machine	70-0390	See website	VEX HEXBUG	Assembly is part of the fun & learning!		✘	
	Vex Gear Racer	70-0388	See website	VEX HEXBUG	Assembly is part of the fun & learning!		✘	
Renewable Energy Kits	Sola F1	13-1070	See website	CIC	Assembly is part of the fun & learning!		✘	
Robotic Kits - Micro:Bit	MicroBot	13-5006	See website	PICAXE	Assembly is part of the fun & learning!	Screwdriver, Small Pliars	✘	
	Robo:Bit MK3 Buggy BBC MicroBit	75-5014	See page 80	4tronix	Assembly is part of the fun & learning!	Screwdriver, Small Pliars	✘	
	Bit:Bot XL Robot for BBC MicroBit	75-5019	See page 80	4tronix	Assembly is part of the fun & learning!	Screwdriver, Small Pliars	✘	
	Bit:Bot XL Starter Bundle	75-0299	See website	Rapid	Assembly is part of the fun & learning!	Screwdriver, Small Pliars	✘	
Robotic Kit - Arduino	MiniQ Arduino Robot	75-0166	See website	DFRobot	Assembled		✘	
Robot Kit - SBC	Ulitmate Robot Kit	75-0282	See page 80	4tronix	Assembly is part of the fun & learning!	Screwdriver, Small Pliars	✘	
Robotic Arms	Robot Arm Wire Controlled	06-9349	See page 79	Rapid	Assembly is part of the fun & learning!	Screwdriver, Small Pliars	✘	
	Dobot Magician Robot Arm	70-0480	See page 78	Dobot	Some assembly		✘	
	Dobot Conveyor Belt Kit	70-0482	See page 78	Dobot	Some assembly		✘	
Robot Arm Kits	Bionic Robot Hand (Left)	75-0216	See page 79	DFRobot	Assembled		✘	
	Bionic Robot Hand (Left)	75-0215	See page 79	DFRobot	Assembled		✘	
	Robotic Arm by Hexbug	70-0389	See page 79	VEX	Assembly is part of the fun & learning!		✘	
	Robotic Motorised Arm	70-0397	See page 79	VEX	Assembly is part of the fun & learning!	Needle-nose pliars, Sidecutter, Screwdirver Set, Double open-end wrench	✘	
	Mini Robot Arm Kit	13-1417	See page 79	Arexx	Assembly is part of the fun & learning!	Needle-nose pliars, Sidecutter, Screwdirver Set (1 x Screw-driver included) Double open-end wrench	✘	
	Programmable Metal Robotic Arm	64-0733	See page 79	Arexx	Assembly is part of the fun & learning!	Needle-nose pliars, Sidecutter, Screwdirver Set (1 x Screwdriver included)	✘	

	Devices Req	Software	Teachers Notes Available	From Price EX VAT	Early Years	KS1	KS2	KS3	KS4	Higher Education	Hobby/Home School
	None	No	✔	£99.99	✔	✔					✔
	iOS or Android phones/tablets. Apps are also available for Kindle.	Free Apps to download	✔	£44.99		✔	✔				✔
	iOS or Android phones/tablets. Apps are also available for Kindle.	Free Apps to download	✔	£134.99	✔	✔	✔				✔
	iOS or Android phones/tablets. Apps are also available for Kindle.	Free Apps to download	✔	£141.99				✔	✔		✔
	PC, Laptop	Free downloadb ale Mblock Software	✔	£63.75				✔	✔		✔
	PC, Laptop	Free downloads	✔	£29.27			✔	✔			✔
	PC, Laptop	Free downloads for Windows or Pi	✔	£134.25		✔	✔	✔			
	PC, Laptop or Ipad	Choregraph - free to download	✔	£5400.00	✔	✔	✔	✔	✔	✔	
	PC, Laptop or Ipad	Choregraph - free to download	✔	£14300.00	✔	✔	✔	✔	✔	✔	
	PC, Laptop	Free downloads for Windows or Pi	✔	£134.25		✔	✔	✔			
	PC, Laptop or Ipad	Free Downloadable	✔	£199.00				✔	✔		✔
	Windows, Mac, Chromebook, iOS & Android tablet compatible	Free software to download	✔	£139.99			✔				✔
	Windows, Mac, Chromebook, iOS & Android tablet compatible	Free software to download	✔	£327.99				✔			✔
	Windows, Mac, Chromebook, iOS & Android tablet compatible	Free software to download	✔	£549.99				✔	✔	✔	✔
	PC, Laptop, Ipad		✔	£60.33				✔	✔	✔	✔
	PC, Laptop, Ipad		✔	£135.18				✔	✔	✔	✔
	None	No	✘	£17.64				✔	✔		
	None	No	✘	£13.81			✔	✔			✔
	None	No	✘	£8.55				✔	✔		
	None	No	✘	£25.36				✔	✔		
	None	No	✘	£14.47				✔	✔		
	None	No	✘	£4.98			✔	✔			✔
	None	No	✘	£1.84			✔	✔			✔
	None	No	✘	£15.88				✔	✔		
	None	No	✘	£16.42				✔	✔		✔
	None	No	✘	£8.36							✔
	None	No	✘	£10.95				✔	✔		✔
	None	No	✘	£11.79			✔	✔	✔		✔
	None	No	✘	£13.32			✔	✔	✔		✔
	None	No	✘	£19.99			✔	✔	✔		✔
	None	No	✘	£12.29			✔	✔	✔		✔
	None	No	✘	£10.26			✔	✔	✔		✔
	PC, Laptop, Ipad		✘	£65.36				✔	✔		✔
	PC, Laptop, Ipad		✘	£28.27				✔	✔		✔
	PC, Laptop, Ipad		✘	£34.90				✔	✔		✔
	PC, Laptop, Ipad	Makecode	✘	£39.95				✔	✔		✔
	PC, Laptop, Ipad		✔	£75.03				✔	✔		✔
	PC, Laptop, Ipad		✘	£76.50				✔	✔		✔
	PC, Laptop, Ipad		✘	£23.34				✔	✔		✔
	PC, Laptop, Ipad		✘	£889.00						✔	
	PC, Laptop, Ipad	Dobot Studio	✘	£308.80						✔	
	PC, Laptop, Ipad		✘	£172.89				✔	✔	✔	✔
	PC, Laptop, Ipad		✘	£156.77				✔	✔	✔	✔
	PC, Laptop, Ipad		✘	£24.99				✔	✔		✔
	PC, Laptop, Ipad		✘	£74.99				✔	✔		✔
	PC, Laptop, Ipad		✘	£104.11							✔
	PC, Laptop, Ipad		✘	£231.57				✔	✔		✔

OZOBOT
THE TINY SMART ROBOT



The Ozobot Evo is an award-winning coding robot for the next generation of creators. It can be coded in two ways: online with OzoBlockly programming, and screen-free with Colour Code markers.

OzoBlockly

OzoBlockly is a graphical programming language based on Blockly which is used by a wide range of educational coding tools. What makes Ozoblockly different is the five progressive programming modes that it offers.

Whichever skill level you are using, Ozoblockly has a built-in help file and plenty of challenges to keep your students busy. Simply colour-print the challenge "maps" on A4 paper and follow the task instructions.

1 Pre-Reader

Suitable even for reception age children, Pre-Reader is the most basic mode in OzoBlockly. It has clear picture-based blocks that are large and easy to assemble.

2 Beginner

Beginner mode extends from Pre-Reader with the introduction of simple loops. Blocks are now described with text titles as well as pictures.

3 Intermediate

Control Ozobot's ability to follow lines using the line navigation category. Intermediate mode also introduces some simple if/else logic blocks.

4 Advanced

Advanced mode significantly expands Ozobot's programmability with the introduction of repeat, while and for loops, more logic, integers, variables and functions.

5 Master

Take full control over Ozobot in Master mode with the addition of lists and arrays

To try Ozobot in your classroom for free please contact **education@rapidonline.com** for details on the free Robotics trial.

Upload your programs to Ozobot by simply holding it against the screen of your device.

- Tablets
- Laptops
- Desktops
- Interactive whiteboards
- Smart phones

Only **£1151.47**
Order code 70-8207

Ozobot Bit Classroom Kit

- The Bit classroom kit includes:
- 18 Bit robots
- Educator's guide
- 3 multi-port USB chargers
- 18 DIY skins
- Evo storage case

Only **£29.27**
Order code 70-8200

Ozobot 2.0 Bit Robot - Crystal White

- 1x custom skin
- 1x carrying case
- 1x USB charging cable
- A demo playground
- Quick Guide instruction booklet

TASK – POLLEN LOVE WITH BEES!

Using Color Codes (or OzoBlockly) students will dress up their Ozobot like a bee.Then, they will recreate the bee's daily journey.

What you will need:

- 1 Evo or Bit Ozobot per group
- 1 Markers per group
- 1 Paper per group
- 1 Supplies to make bee costume per group
- 1 Tablet or computer (if using OzoBlockly) per group

Lesson Objectives

Explain the process of pollination orally and through a drawing

Student Practice (Student Facing Instructons):

1 Using the materials provided, create a bee costume to put on your Ozobot.
Goals: Create and attach a bee costume to Ozobot.

2 Create a map to tell a story of the day in the life of a bee. You must include drawings.
Goals: A map of the bee's journey.

3 If using Color Codes, draw a black line to guide your Ozobot bee. You must include at least two diferent Colour Codes along the journey.

For OzoBlockly, code your Ozobot bee on your tablet or computer. You must include at least two block codes that are not directions.

Goals: Code the Ozobot bee's journey.

Direct Instruction (Teacher Facing Instructions):

1 Start by giving a quick explanation of the pollination process and background info on bees. How do bees pollinate flowers? What are some threats that bees face daily? Where do bees live? Why is pollination important?

2 Pair students up in groups (the number of students per group is up to you) and give them markers, a sheet of paper, and any materials you have for them to create a bee costume for their Ozobot. NOTE: If using OzoBlockly, also provide them with a tablet or computer.

3 Instruct the students to recreate a day in the life of a bee. They must create a map (if using Colour Codes) that will guide their Ozo-Bee around. They must include pollination, a bee threat, and a beehive. NOTE: If using OzoBlockly, the students will stlll create a map, just not use black lines. They will code Ozobot to move using OzoBlockly.

4 The students must include at least two diferent Colour Codes on their map, such as stopping at flowers to pollinate or speeding away from a bird.

5 You can have students present their maps to the class, or even record them.

Ready to Go Robots

Ozobot 2.0 Bit and Ozobot Evo Interactive Robots

Expand your child's horizons with the help of **Ozobot Bit and Ozobot Evo**, the tiny **smart robots**.

There's no end to the possibilities, as your child creates a different landscape of adventures, games and coding with Ozobot. Imagine, a learning toy that opens the doors of **computer science, STEM Education**, robotics and coding, putting your child one step ahead of the learning curve in school and in life.

Starting with colour markers, Ozobot takes kids on a fun and mesmerizing experience through creative drawing, problem solving and group challenges using colour code commands in the form of basic colour combinations.

Ozobot's ability to learn your programs, and then play them back is a big game changer to how young minds play and learn. OzoBlockly - a web-based visual editor - offers five step-up modes from icon-based to loops, logic and equation blocks to appeal to young kids and even to challenge the seasoned programmer.

Ozobot Bit and Ozobot Evo are available in Crystal White and are also available in money-saving classroom kits containing 18 robots.

- **Bit** is the original Ozobot
- **Evo** is an app-connected coding robot for the next generation of creators
- Colour codes, made with markers or stickers, provide a super cool, screen-free way to code **Evo and Bit**
- Ozoblockly is a programming language that lets you drag and drop blocks to code **Evo and Bit**
- Code **Evo and Bit** with colour codes, then advance to OzoBlockly
- **Bit** is recommended for ages 6+, Evo is recommended for ages 9+
- **Both robots provide** beginner coding, STEAM (STEM + art) skills and employ the screen-free colour codes and online OzoBlockly coding methods
- **Evo also** caters for advanced coding, is Bluetooth enabled, has built-in tricks - behaviours & games, and allows social, friends and chat possibilities

Type	Order code	1+
Ozobot 2.0 Bit Robots		
White - single	**70-8200**	29.27
White - kit of 18	**70-8207**	1151.47
Ozobot Evo Robots		
White - single	**70-8203**	88.99
White - kit of 18	**70-8206**	1555.04

563354

Washable Colour Coding & Black Line Following Marker Pens

You can draw colour-coded or line-following courses for your **Ozobot robots** with the stroke of a **marker** with these handy packs from **Ozobot**.

- Draw lines and colour codes, for programming on paper
- Create roads, mazes, and maps for Ozobot to follow
- Washable and non-toxic
- Angled tips make colour coding easy
- Supplied in **packs of 4 markers**
  - **Colour pack** contains 1 of each of black, blue, green and red
  - **Black** pack contains 4 black markers

Not suitable for children under 3 years. See pack for details.

Type	Order code	1+
Colour markers	**70-8202**	5.04
Black markers	**70-8208**	4.79

566416

P1030024 Codey Rocky Programmable Robot

What is Codey Rocky?

The **MakeBlock Codey Rocky** is a coding robot for **STEAM** education. Codey provides an entertaining learning experience and introduction to programming for ages 6+. With the combination of easy-to-use robotics hardware together with **mBlock 5** block-based programming, you'll be up and coding within minutes.

Codey Rocky features an innovative 2 in 1 design structure:

See page 60 for Sorting Waste Project

Brainy Codey

Codey is the brains of the outfit, having over 10 programmable electronic modules that produce enough data for a host of applications.

Agile Rocky

Getting around is what Rocky loves best. Not only will Rocky swirl and follow lines, it will also navigate around obstacles, and you will have programmed Codey Rocky to do it.

The robot has a host of electronic modules, including a sound sensor, light sensor and an LED dot matrix display. You'll be able to code Codey Rocky to play music, follow lights, mimic facial expressions and a whole lot more. With some easy coding you'll be able to turn imagination into reality and enhance your skills, ability and confidence while you're doing it.

- R Transmitter/Receiver: communicate with other robots and allows infrared remote control of electrical appliances
- Gear Knob: adjusts volume and variables
- LED Display: shows various patterns and RGB lighting effects
- 6-axis Gyroscope: detects tilts, shakes and turn angles, useful in designing somatosensory tricks which require tilts and shakes
- RGB LED Indicator: can be programmed freely, making Codey Rocky even more fun and expressive
- Voice sensor: detects ambient and motion sound levels
- Light sensor: detects the level of ambient light
- Buttons: all programmable for customisation
- Colour Infrared Sensor: detects colours, avoids obstacles, calculates distance and enables cruising

How do I do all this?

Well, at the heart of Codey Rocky is the **mBlock** software.

You harness the power and ease of this intuitive graphical programming software which makes programming simple and fun. By dragging and dropping building blocks on a flowchart-like interface you can set every movement that the robot makes. With one click you can even turn your block-based program into Python code so you can continue to learn and advance your programming skills.

With its built-in Wi-Fi, Codey Rocky can quickly connect to the cloud, opening up a new world of IoT functionality. Why not obtain weather data and use Codey Rocky to make forecasts? You can even make Codey Rocky into a wearable device.

Codey Rocky robot, of course, comes with loads of learning materials, helping to give you the professional guidance you need. There are example programs and tutorials that are constantly being updated and cover entry, intermediate and advance level projects.

Included with the kit is:

1 x Codey
1 x Rocky
1 x Lanyard
1 x Micro USB data cable
8 x Codey Rocky colour card
1 x Name Sticker

Further information can be found at **www.rapidonline.com**.
Documentation
Quick Start Guide
Rocky Coding Guide

- Set your imagination free and unshackle your creativity with Codey Rocky!
- mBlock software
- Software learning + hardware creation
- Create dot matrix animations, design games, realise AI and IoT applications
- Programming as simple as playing blocks
- Switch to Python with one click for advanced programming learning
- AI ready with cutting-edge technology
- Program like building blocks
- Easy to start creating simple projects
- Low-entry for beginners to learn AI; fun with IoT, seize the future ahead
- Compatible with Makeblock Neuron
- Have fun with 10+ programmable sensors

Type	Order code	1+
Codey Rocky	**75-0516**	63.75
Class bundle of 10	**75-0519**	649.99

567266

Arduino Compatible Ultimate Robot 10 in 1 Kit

The **Ultimate 10 in 1 robot kit from Makeblock** is the flagship of the Makeblock range with more parts, more possibilities and more fun. At the heart of the kit is the MegaPi robotics controller which is based on the popular Arduino Mega 2560 but with additional motor driver interfaces. With dedicated motor power inputs the MegaPi can drive up to 10 x servos plus 8 x DC motors or 4 x stepper motors simultaneously with a maximum output current of up to 10A. You can program it using the mBlock graphical programming tool or as you get more confident, graduate to C/C++ using the Arduino IDE. If you have a Raspberry Pi, it can function as the brains of your robot while the MegaPi handles the low level details opening up whole new area for creativity and exploration. It also supports a Bluetooth adaptor for wireless remote control from your Apple iPad (v3 or better) or Android (v4 or better) tablet.

With over 160 pieces, the Ultimate kit has plenty for you to work with including a gripper, 3 x DC motors, a phone mount, plus a wealth of beams, plates and brackets to build a large model. The major mechanical parts are made from beautiful anodised 6061 aluminium giving your robot a professional, hi-tech look as well as being very sturdy. The free Makeblock tutorial page walks you through creating the 10 x different robots, by which time you'll be a robotics expert and ready to strike out on your own. You can build a tank with a robotic arm, a mobile drinks pourer, a camera dolly, two types of 360° rotating photography platforms, a self balancing robot, a 6-legged crawler, a rolling tank, a detecting robot, and a catapult ram.

New to mBlock/Scratch? mBlock is a graphical programming system based on Scratch where you drag and drop functional blocks from a palette onto a work area to create a program. Each shape has a different function and they snap together in logical ways, some even have slots to drop in other blocks. For example, a block might order the robot to run forward at speed 50 where the direction and speed are chosen from simple drop down menus. This drag and drop interface allows quite young children to get creative with the mBot yet is capable of programming complex behaviours.

Supplied with 1 x MegaPi, 1 x MegaPi shield for RJ25, 1 x Bluetooth module, 4 x motor drivers, 3 x encoder motors, 1 x ultrasonic sensor, 1 x line follower sensor, 1 x 3-axis accelerometer and gyro sensor, 1 x RJ25 adaptor, 1 x electronic shutter release, 1 x Makeblock gripper, 1 x 360° mobile phone bracket, 1 x battery holder (for 6 x AA batteries, not supplied) plus aluminium beams, plates and brackets, plastic timing pulleys, plastic gears, tracks and wheels, cables, nuts and bolts, and other hardware and accessories.

Please note that the Raspberry Pi, Pi camera, smartphone, DSLR camera and toy props are shown for illustration purposes and are not supplied.

- 10 robots in 1 kit
- Arduino compatible robot controller
- Range of free programming tools from novice to advanced
- Free tutorial online to help get you started
- Wireless programming via Bluetooth
- Complete kit, just add batteries

Type	Order code	1+
Ultimate robot kit	**75-0695**	218.90

563845

makeblock

mBot Ranger Arduino Compatible STEM 3-in-1 Robot Kit

The **mBot Ranger 3 in 1 from Makeblock** is an intermediate robotics kit for STEM or personal use. It is based around the Me Auriga programmable module with Arduino Mega 2560 compatibility which brings with it excellent online educational and tutorial resources. The Me Auriga has a wide range of programming options from novice to expert using free Open Source tools including mBlock, a graphical Scratch-like programming tool, all the way up to C/C++ using the Arduino development tools. You will be able use the kit's range of sensors including an ultrasonic range finder, LED line follower, microphone, temperature sensor, light sensor and a 6-axis accelerometer/gyroscope. It also has a buzzer and 12 x RGB LEDs so your creation can flash and bleep messages to you.

To compliment the electronics, the Ranger kit contains all the parts you'll need (down to the last screw) to build 3 x very different robots; the tracked off-road tank, a fast trike and a fascinating self-balancing two-wheeler. The major parts are made from beautiful anodised aluminium giving your robot a professional, hi-tech look. Using the simple, step by step instructions and tools provided the kit should be ready for programming in no time. Take it for a test drive without any programming by pairing it over Bluetooth to your Apple or Android smartphone or tablet using the mBot app from the App Store or Google Play.

Programming your new gadget is where the adventure really begins. Jump into programming using the free mBlock program on your Windows or Mac PC and the supplied USB cable. Alternatively, use the Makeblock HD app on your iPad (v3 or better) or Android tablet (v4 or better) with a Bluetooth connection to read data from the sensors, control the robot and write programs using mBlock. When you start to feel more confident you can program the Arduino compatible Me Auriga using the Arduino IDE in C/C++. Choose the programming tool that best suits your abilities and preferences.

New to mBlock/Scratch? mBlock is a graphical programming system based on Scratch where you drag and drop functional blocks from a palette onto a work area to create a program. Each shape has a different function and they snap together in logical ways, some have slots to drop in other blocks. For example, a block might order the robot to run forward at speed 50 where the direction and speed are chosen from simple drop down menus. This drag and drop interface allows quite young children to get creative with the Ranger yet is capable of programming complex behaviours.

Supplied with a printed instruction sheet, printed line-follower track, the Me Auriga Arduino compatible controller, 2 x DC encoder motors, Bluetooth module, Me Line Follower module and cable, Me Ultrasonic sensor, Makeblock beams and plates, wheels and tracks, screws and nuts, screwdriver, spanner , USB cable, and battery holder (requires 6 x AA batteries, not supplied). Makeblock provide a free tutorial to help you get the most out of this great kit.

- Build 3 x different robots from one kit
- Simple to build and program
- Range of free programming tools from beginner to advanced
- Ideal for STEM applications
- Drive the mBot Ranger from your smartphone
- Complete kit, just add batteries
- Bluetooth v4.0 or better is required for PC or Mac connectivity

Type	Order code	1+
mBot Ranger	**75-0699**	135.18

563838

makeblock

mBot Arduino Compatible STEM Robot Kits with Bluetooth or 2.4GHz

The **mBot from Makeblock** is the perfect introduction to robotics for STEM or personal use. It is based around the mCore programmable module with Arduino UNO compatibility which brings with it excellent online educational and tutorial resources. The mCore has a wide range of programming options from novice to expert using free Open Source tools including mBlock, a graphical Scratch-like programming tool, all the way up to C/C++ using the Arduino development tools. You will be able use the kit's range of sensors including an ultrasonic range finder, LED line follower, and light sensor. It also has a buzzer and an RGB LED so your creation can flash and bleep messages to you. Finally, there's an infrared receiver and transmitter that you can use to control the bot using the remote control included in the kit (requires 1 x CR2025 coin cell, not supplied). The infrared can even be used to talk between mBots if you are feeling ambitious.

To compliment the electronics, the mBot kit contains all the parts you'll need to build your first bot, down to the last screw. The major parts are made from beautiful anodised aluminium giving your robot a professional, hi-tech look. Using the simple, step by step instructions and tools provided, the kit should be ready for programming in less than 20 minutes.

Programming your new gadget is where the adventure really begins. Jump into programming using the free mBlock software on your Windows or Mac PC and the supplied USB cable. When you start to feel more confident you can program the Arduino compatible mCore using the Arduino IDE in C/C++. The **Bluetooth kit** (75-0702) has a range of programming and control options by pairing with Apple or Android smartphones and tablets including an mBot app, Makeblock HD and mBlockly (Apple only). The **2.4GHz kit** (75-0701) uses a wireless virtual USB connection (like a wireless mouse) so that you can program the mBot from the other side of the room as if it was plugged directly into your computer.

Once you've mastered the challenge of building and programming your mBot and you want a new adventure it's time to try some of the cool add-ons from Makeblock. Use the **6-legged add-on kit** (75-0705) with parts from the mBot kit and learn about levers and linkages while building a creepy crawly beetle. Alternatively, enhance the character of your creation with the mBlock compatible **Me 8x16 Blue LED Matrix** (75-0707) for simple animations or text. Perhaps you could have your mBot scan its environment by mounting its ultrasonic range finder on the **Servo Pack add-on** (75-0704), or give it a home-made flag to wave. The servo add-on gives you extra options for movement with your mBot.

New to mBlock/Scratch? mBlock programming system based on Scratch where you drag and drop functional blocks from a palette onto a work area to create a program. Each shape has a different function and they snap together in logical ways, some even have slots to drop in other blocks. For example, a block might order the robot to run forward at speed 50 where the direction and speed are chosen from simple drop down menus. This drag and drop interface allows quite young children to get creative with the mBot yet is capable of programming complex behaviours.

Supplied with a printed instruction sheet, printed line-follower track, the mBot Arduino compatible controller, 2 x DC motors, Me Line Follower module and cable, Me Ultrasonic sensor, chassis, wheels and all screws, screwdriver, USB cable, battery holder (requires 4 x AA batteries, not supplied) and an infrared remote control (requires 1 x CR2025 coin cell, not supplied). The Bluetooth and 2.4GHz versions are supplied with their respective modules. The 2mm thick aluminium chassis is attractive and strong, but better yet it's **compatible with Lego Technic** parts. Whether you have one mBot or an army there's plenty of opportunities to problem solve and learn new skills.

- Simple to build and program
- Range of free programming tools from beginner to advanced
- Ideal for STEM applications
- Wireless programming via 2.4GHz USB link or Bluetooth
- Complete kit, just add batteries
- Dimensions 170 x 90 x 90mm assembled
- Weighs 340g

Type	Order code	1+
mBot v1.1 2.4GHz	**75-0701**	60.33
mBot v1.1 Bluetooth	**75-0702**	54.20
mBot Servo add-on	**75-0704**	14.90
mBot 6-legged add-on	**75-0705**	14.90
mBot LED matrix 8x16	**75-0707**	8.11

563837

makeblock

Robot Grippers

These grippers from **Makeblock** let your robot grab and carry objects giving you a new dimension of robot building to explore.

The **Mini-gripper** is perfect for getting a grip on lightweight objects. The gripper is made from acrylic and powered by a 9g servo to grab and carry small items such as ping-pong balls, plastic cups, Makeblock parts etc. The Me RJ25 (75-0712) adaptor is required to connect the Mini Gripper to the main board of any of the Makeblock robots.

The **Robot Gripper** is for getting a dealing with bigger objects than the mini-gripper can. The gripper is made from lightweight PVC and powered by an N20 screw motor which is protected by a thermal overload fuse. Suitable for the mBot (75-0701 or 75-0702) and mBot Ranger (75-0699). The Me Dual DC Motor Driver adaptor (75-0713) is required to connect the gripper to the mBot's main board.

Mini gripper:
- Accepts items between 22 and 60mm
- Accepts items up to 60g
- Requires an Me RJ25 adaptor (75-0712), not supplied
- Operating voltage 5 to 12V DC

Robot gripper:
- Non-slip covering for safety
- Accepts items up to 65mm
- Accepts items up to 1.5kg
- Requires an Me Dual DC Motor Driver (75-0713), not supplied
- Operating voltage 12V DC

Type	Order code	1+
Mini-gripper	**75-0706**	13.00
Robot gripper	**75-0703**	24.37
RJ25 adaptor	**75-0712**	3.09
Dual DC motor driver	**75-0713**	19.37

563844

SORTING WASTE PROJECT

makeblock education

This program helps recognize and classify waste. Based on the recognition result, Codey's LED display will show a sign with the lights in front of one of the waste bins turning on to tell you which bin you should throw your waste in.

Note: This program should be run under Live mode.

TASK – DATA FLOW

Deep Learning Extension

Watch our video

youtube.com/rapideducationtv

Codey Rocky Programmable Robot

£63.75

Order code 75-0516

Magnetic USB Lead with Micro USB Connector 1m

£5.20

Order code 19-9930

TASK – CREATING A TRAINING MODEL

Training model → Learn the samples → Use the model

Note: Adding more pictures (30+) increases the accuracy of the model

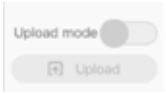
TASK – USING THE MODEL

We want Codey Rocky to respond to the trained model.

When you have written your code, you will need to upload it to your robot.
You can follow the steps below:

1. 
Select Codey Rocky as the device

2. 
Upload the code you have written

3. 

Turn off upload mode

4. 

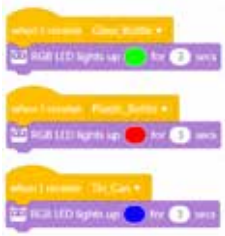
Run your chosen event to start your program

HOW TO USE THE TRAINING MODEL WITH A SPRITE

HOW TO USE THE TRAINING MODEL WITH CODEY ROCKY

Sprite environment:

Device environment Codey Rocky:



TASK – PEDAGOGICAL APPROACH

AS YOU WORK THROUGH THE TASKS TOGETHER CONSIDER WHAT YOU ARE LEARNING:

Technology literacy: exploring the software & hardware
Information literacy: what data is being processed to analyze the images and how does information flow?

Group work

- Collaboration: work together to solve the problem
- Communication: share your ideas
- Social skills : listen & reach agreements together

Activities

- Problem solving: write a code so that mBlock recognizes & processes the image
- Creativity: there are many ways to reach the objective
- Flexibility: try different options to solve the problem

WONDER LEAGUE
MINI MISSIONS

Dash and Dot are the coolest, cutest robots around and they are on a mission to help teach KS1 and KS2 aged children. Both robots are feature-packed and can be programmed with Android, iOS, Kindle and Chromebook devices. Dash robot and Dot robot come ready-assembled and require almost no set up. They even have built-in rechargeable batteries so getting going couldn't be easier.

TASK – MINI MISSION #1

What you will need:

- A robot (Dash or Cue)
- Six individual cups
- Your device
- Your 150cm by 240cm grid mat with 30cm grid cells

Set up:

- Start Dash in C1
- Put 1 cup upside down in the corner of D3, D4, C7, C8, B3 and B6.

Directions:

- Program your robot to show off all the colours of the rainbow.
- As you travel to each cup, use the light blocks to showcase the colour that is in each square
- Have your robot finish in A8.

Take it further

- Can you program your robot to move all the cups into their own cells in column 8 in the rainbow sequence?

TASK – MINI MISSION #2

What you will need:

- A robot (Dash or Cue)
- Four individual cups
- Your device
- Your 150cm by 240cm grid mat with 30cm grid cells

Set up:

- Start Dash in C1
- Put 1 cup upside down in the center of D3, D4, D5 and C4.
- Put 1 ping pong ball on top of the upside down cup in D4.

Directions:

- Program Dash to move all four cups into their own individual cells in row E.
- Be sure not to knock over the ping pong ball on top of the upside down cup in D4.

Take it further

- Can you program your robot to move all the cups into their own cells in row E with only moving x cm total?
- How about x cm?

Wonder Workshop

Dash Robot

Dash is one of the coolest, cutest robots around and it's on a mission to help KS1 and KS2 children learn to code.

A real robot

Dash is a ready-assembled robot that requires almost no setting up and it even has a built-in rechargeable battery, so getting going couldn't be easier.

But whilst it is really easy to use and set up, Dash is a really smart robot that is packed with features and sensors - it can detect objects around it, knows which direction a sound is coming from, record and playback sounds and communicate with other Dash and Dot robots.

Programming Dash

Wonder Workshop have created a whole suite of applications for iOS and Android phones and tablets. The apps are also available for Kindle.

For younger children (5 to 7 years old) the **Path, Xylo** and **Go** apps are an excellent introduction to basic sequencing, spatial reasoning and navigation. For older children, **Wonder** and **Blockly** offer a visual coding experience that guides beginners through their first programs and lets students experiment with logic, loops and variables as their skills increase.

Type	Order code	1+
Dash robot - single	**70-1100**	134.99
Dash robot pack of 6	**70-1115**	759.00
Dash robot pack of 12	**70-1116**	1485.00

566001

Dot Robot

Dot is Dash's companion and is the brains without the brawn! Whilst Dot doesn't have wheels to make it move, it has loads of cool sensors and can interact with Dash as well as being used as a stand-alone device.

Dot can hear sound, light up any colour you like, know when and how it is being moved and communicate with Dash.

Programming Dot

Wonder Workshop have created a whole suite of free applications for iOS and Android phones and tablets. The apps are also available for Kindle.

Wonder and **Blockly** offer a visual coding experience that guides beginners through their first programs and lets students experiment with logic, loops and variables as their skills increase.

To find out more about Dot and the apps, visit www.rapidonline.com/dashrobot

Type	Order code	1+
Dot robot	**70-1101**	44.99

566002

To find our more about Dash and Dot and the apps, visit www.rapidonline.com/dashrobot

Cue Robot

Meet **Cue** - an entertaining robot from **Wonder Workshop** with four hero avatars and enhanced AI which takes **personality**, interactive communication, and programming to a higher level.

Cue is funny, clever and a little bit sassy. It's new AI engine was designed to engage users emotionally, and its intelligence, humour, and deep content surface within chat interactions and autonomous behaviours.

Cue employs four hero avatars, each with a different personality, to deliver interactive communication and allow youngsters to learn at their own pace and level.

Cue's extensive Chat library includes 30,000 responses with a vocabulary of over 170,000 words and has auto modes (seek, avoid, and explore) to navigate tight corners or obstacles while expressing personality at every turn.

Compatible with block building, JavaScript text mode, children can use the coding skills they've acquired at school, and build on them in their own time.

Cue aims to teach children the basics of **coding** while having fun.

To watch Cue in action click **here.**

- Suitable for children aged 11 to 14
- Supplied with 1 lithium battery

Type	Order code	1+
Cue robot	**70-1108**	141.99

566469

Dash and Dot Challenge Card Set
£22.99
Order code **70-1107**

Gripper Building Kit
£28.99
Order code **70-1114**

Learn to Code Curriculum Guide and Subscription for Dash and Dot
£109.99
Order code **70-1109**

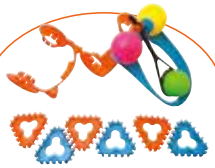
Sketch Kit
£34.96
Order code **70-1110**

Markers Refil Kit Pack 6
£9.55
Order code **70-1121**

Dash and Dot Building Brick Connectors
£12.90
Order code **70-1105**

Dash and Dot Wonder Pack
£195.00
Order code **70-1104**

Xylophone for Dash Robot
£29.99
Order code **70-1103**

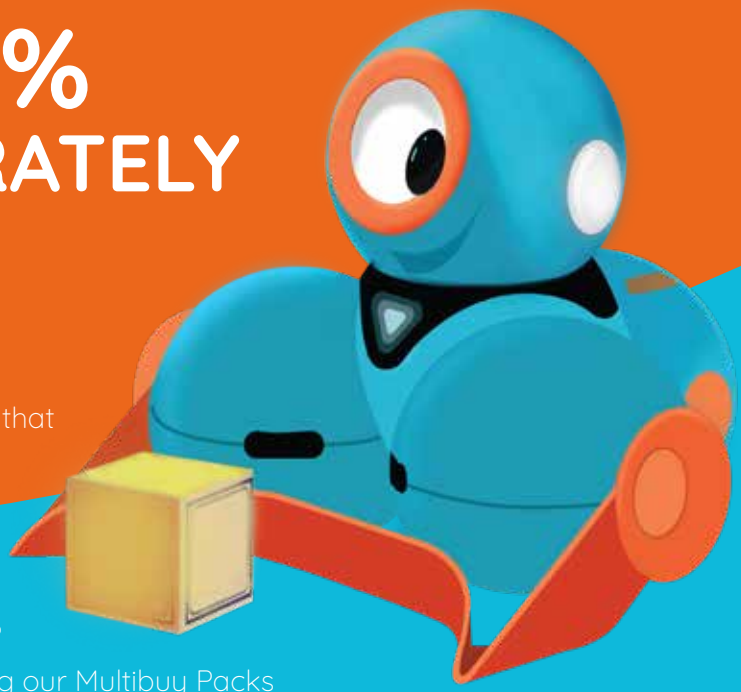


Launcher for Dash Robot
£20.99
Order code **70-1102**

Dash and Dot Accessory Pack
£29.99
Order code **70-1106**

SAVE UP TO 25%
OVER BUYING SEPARATELY
with our Wonder Workshop bundles

Our money-saving bundles are perfect for schools or clubs that are looking for the most cost effective and comprehensive way to implement robotics.



Dash Robot Multibuy Packs

If you need multiple Dash robots, get the best value by using our Multibuy Packs

SAVE £50.94

6x Dash Robot Multibuy Pack

£759.00

Order code 70-1115

SAVE £134.88

12x Dash Robot Multibuy Pack

£1485.00

Order code 70-1116

SAVE £65.95

Wonder Pack

The Wonder Pack is a bundle containing both Dash and Dot robots as well as a whole host of accessories - the Xylophone, Launcher, Accessory Pack and Building Brick Connectors are all included. Ideal for those wanting to work with small groups.

£195.00

Order code 70-1104

Code Club Bundle

This bundle takes all the advantages of the Wonder Pack and adds another Dash robot, the Sketch Kit and a set of Challenge Cards which make it perfect for after school club use or as a way of expanding your computing lessons.

£359.99

Order code 70-1118

SAVE £92.24

£1800.00
Order code 70-1120

SAVE £201.24

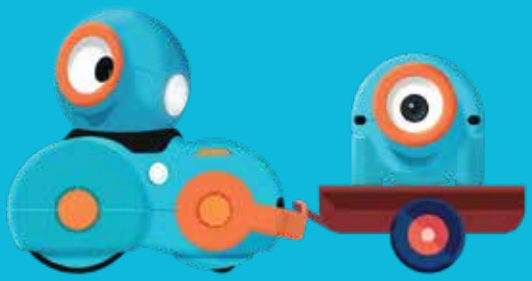
Wonder Workshop Class Bundle

Perfect for full classes working together in small groups of 2 or 3 students. This bundle contains robots, teaching materials and some of the most popular accessories.

Quantity	Description
10	Dash robot
10	Challenge Card set
5	Sketch Kit
5	Gripper Kit
1	Learn to Code Curriculum Guide

Class Bundles

Class bundles contain robots, accessories and teaching materials giving you everything that you need to deliver exciting lessons using Wonder Workshop robots and providing a saving over purchasing separately.



Wonder Workshop Ultimate Bundle

Our Ultimate bundle packs in both Dash and Dot robots, a wide range of accessories and teaching materials too. In smaller classes, students will be able to work with one robot each. In larger classes, there is still enough hardware for children to work in pairs.

Quantity	Description
15	Dash robot
5	Dot robot
5	Challenge Card set
15	Sketch Kit
5	Launcher Kit
5	Gripper Kit
5	Xylophone
5	Learn to Code Curriculum Guide

SAVE £402.19

£2689.00
Order code 70-1117

cue™

Cue is a programmable robot who is closely related to Dash. Visually, Cue looks really similar to its brother, but the biggest difference is how Cue is programmed. Whilst Dash is ideal for learning coding at Key Stage 1 and 2, Cue is better suited to Key Stage 3

CUE
£141.99
Order code 70-1108

Cue and the curriculum

Here are a few ways in which Cue can help deliver the computing programmes of study at KS3:

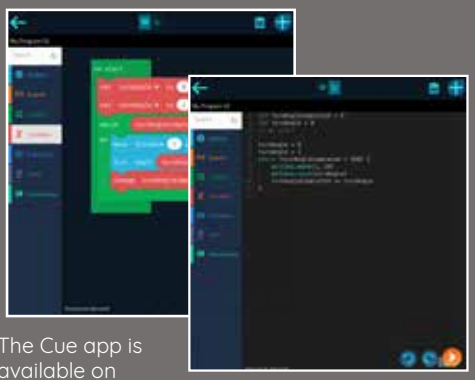
- Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems – **use Cue to simulate autonomous navigation, social robots, human-robot interaction**
- Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem – **collect and filter data from sensors to remove errors, create an algorithm to solve a maze, create an algorithm to draw a specific shape using the sketch kit**
- Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions – **Cue app allows you to use both blocks and text (JavaScript) to create programs. In both, students can create functions, variables and use events**
- Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal] – **all standard Boolean logic can be implemented in the Cue app using both block and JavaScript coding**

Accessorise and customise!

Because the shell of Cue is identical to that of Dash, it is compatible with all the same accessories including the Building Brick Connectors and the Sketch Kit. (70-1110 & 70-1105)

Programming

Cue is programmed using an app using Microsoft's MakeCode platform. It's the same tech that the micro:bit programming language is built on which means it is tried and tested in an education environment. Like its micro:bit counterpart, the Cue app allows you to code in a graphical block language or using a text-based JavaScript environment.



The Cue app is available on Windows 10, iOS & Android devices.

SoftBank Robotics

SoftBank Robotics

Pepper Academic Edition Robot 3 Year Warranty

Pepper is an autonomous talking humanoid robot which can be programmed to perceive emotions and adapt its behaviour to the mood of the humans around it. Pepper can identify joy, sadness, anger or surprise and respond appropriately making interactions with humans incredibly natural and intuitive.

It has astonishing flexibility and fluidity of movement and can gesture with the speed and grace of a human while its 3 omni-directional wheels enable the robot to move around freely through 360°. Pepper has a total of 20 degrees of freedom. The robot also has a 10.1 inch touch screen which allows the integration of web pages, applications and images.

Pepper was designed to make interactions with human beings as natural and intuitive as possible and as a result the robot has been used in commercial applications all over the world.

Programming Pepper is easy using the bespoke Choregraphe* software which has been tried and tested on Pepper's smaller cousin NAO. Choregraphe* is used to build and manage the behaviours that you develop for the robot. Advanced users can also develop applications and behaviours using the Python and C++ SDKs

Academic package includes:
Pepper robot
30Ah battery
Power supply/battery charger
3-year warranty

- Height: 1.2m (4ft)
- Weight: 28kg (62lb)
- Battery: lithium-ion 30Ah (for 12 hours usage)

Academic package includes: *Pepper robot, 30Ah battery, power supply/battery charger and 3-year manufacturer's warranty. Please note – Pepper is only available to schools, colleges and universities. For commercial requirements, please contact us.*

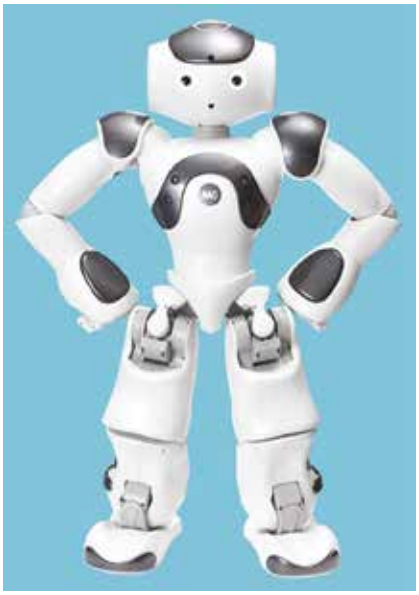
**Mac compatibility of Choregraphe is for OS X 10.8.3 and previous. Later versions are currently not compatible.*

Type	Order code	1+
Pepper robot	**70-8870**	14300.00

563399

SoftBank Robotics

NAO6 Academic Edition



The NAO6 is the latest generation of the brilliant NAO humanoid robot family. Having continuously evolved from the 1st generation, this 6th generation model gives even more performance and
greater capabilities than ever before. Improvements have been made in virtually every area as well as a host of new features such as a dual-mode camera and auto-focus.

NAO is still the most widely used humanoid robot for academic purposes worldwide. The robot creates a unique human-robot interaction experience and is a renowned teaching aid for use in areas such as robotics, systems and control and computer sciences. Use NAO to explore programming, sensors, interaction with people and the environment and much more.

The robot is capable of autonomous movement, and can converse with anyone as well as identifying objects and interacting with its environment. Anyone can write the programs that let NAO know what you want it to do, the graphical interface of the **Choregraphe** software.

Students can explore event-based, sequential or parallel programming using the configurable behaviour boxes. You can also create your own behaviours, as well as using Python to write more complex scripts.

NAO robot can be programmed by either connecting an Ethernet cable between the robot and your computer, or via a WiFi connection. The software suite is compatible with Windows, Mac and Linux.

NAO can only be supplied to schools, colleges and universities. To find out more, please contact **education@rapidonline.com** or call us and speak to a member of the Education Team.

- Robots available with either 2 year or 3 year warranty
- NAO robot stands 58cm tall and is packed full of technology
- Humanoid body with 25 degrees of freedom for realistic movement
- 1-Year maintenance extension available, 70-8896

Note: *Please note that these robots can only be supplied to educational establishments.*

Type	Order code	1+
NAO6 + 2 yr warr.	**70-8893**	5400.00
NAO6 + 3 yr warr.	**70-8894**	6300.00
1 Year maint. ext.	**70-8896**	1000.00

567052

How do I ...

Email baskets?
Register Online?
Find invoices?

www.rapidonline.com/schools-faq

SoftBank Robotics

NAO Humanoid Robot Spare Rechargeable Battery and Charger

A spare or replacement rechargeable battery and charger pack for the NAO humanoid robot.

- Spare or replacement battery and charger pack for NAO robot
- Allows extended operation without interruption

Type	Order code	1+
Battery charger	**70-8888**	168.00
Battery & charger	**70-8897**	269.00

539029

Rapid

NAO Humanoid Robot Hard Transport & Storage Case

Move and store your NAO robot safely and easily with this super-strong wheeled transport case.

- Retractable rubber-coated handle
- Two built-in wheels
- Four press-and-pull latches
- Two padlock loops
- Durable lightweight HPX® polycarbonate resin
- Water resistant
- Inner dimensions: 55.9 x 43.2 x 25.4cm (22 x 17 x 10in)
- Outer dimensions: 62.5 x 50 x 29.7cm (24.6 x 19.7 x 11.7in)
- Weight (empty) 7.62kg (16.8lb)

Please note: *The styrofoam packing supplied with your NAO robot at time of delivery should be retained to fit inside the case. This will then give perfect protection for your robot during transportation and storage.*

Type	Order code	1+
NAO transport case	**70-8890**	340.79

555906

SoftBank Robotics

INTERESTED IN FINDING OUT WHAT NAO CAN DO?

ONLY WANT NAO FOR ONE TERM?

Pepper Robot Academic Edition with 3 year warranty
Order code 70-8870
£14,300.00

For more information about our NAO Robot rental deals email **education@rapidonline.com**

NAO6 Robot Academic Edition plus 2 year warranty
Order code 70-8893
£5,400.00

GET IN TOUCH NOW FOR DETAILS OF OUR NAO RENTAL DEALS!

VEX IQ®

The path towards a passion for STEAM starts early

Super Kit
£327.99
Order code
70-7891

Primary and secondary school is the most formative time in a young student's life. The best way to instill a lifelong interest in the areas of Science, Technology, Engineering, Art and Maths (STEAM) is to provide a fun, engaging, and hands-on opportunity to explore and experience it for themselves.

By its nature, the study of robotics inherently incorporates all pillars of STEAM. VEX IQ is a snap-together robotics system designed from the ground up to provide this opportunity to future engineers of all skill levels. By packaging advanced concepts into an accessible package, the system also naturally encourages teamwork, problem solving, and leadership for students as young as 8.

The Super Kit takes educational robotics to the next level. Use the familiar handheld Controller with the pre-programmed code to drive robots right out of the box, or program them to run autonomously using the additional Smart Sensors. While the included Clawbot IQ instructions help students easily build their first robot, the wide variety of additional included parts means that a team of students can build a robot that is bigger, stronger, and more functional.

- Snap-together parts
- Includes programmable Brain, controller, batteries, 4 motors and 7 sensors
- Over 800 structural and motion components
- Supplied in stackable storage bin
- Use the FREE VEXcode Blocks app on Windows, Mac, Chromebook, iOS and Android to program your creations
- Numerous additional example robot instructions to download from **www.rapidonline.com/vexiq**

VEX GO

GO get creative

Meet VEX GO.

An affordable construction system that teaches the fundamentals of STEAM through fun, hands-on activities that help young students perceive coding and engineering in a fun and positive way.

- Easy to assemble/disassemble
- Includes programmable Brain, battery, 3 motors, Eye Sensor, LED Bumper and Electromagnet
- Supplied in storage cases making it easy to keep track of parts
- Use the FREE VEXcode Blocks app on Windows, Mac, Chromebook, iOS and Android to program your creations

VEX GO kit £139.99
Order code 70-6311

Preorder and find out more at **www.rapidonline.com/vexgo**

VEX 123

Robotics as easy as 123

Children as young as 5 can learn to code with VEX 123.

- Program sequences using the buttons on top of the robot
- Create more complex programs by sliding cards into the Coder
- Use the FREE VEXcode Blocks app on Windows, Mac, Chromebook, iOS and Android to unlock the full power of 123

Robot and Coder only £99.99
Order code 70-6248

Preorder and find out more at **www.rapidonline.com/vex123**

VEX ROBOTICS

VEX 123

Key Stage 1

VEX 123 is an interactive, programmable robot that takes Computer Science and Computational Thinking off the screen and brings them into the hands of primary students.

123 ROBOT (GREEN) AND CODER

Other colours available.

£99.99

Order code 70-6250

123 FIELD

£46.85

Order code 70-6259

CLASSROOM KIT FOR 12 STUDENTS.

£699.99

Order code 70-6265

VEX GO

Key Stage 2

VEX GO is an affordable STEM construction system that taps into children's natural inquisitiveness. VEX GO utilises the VEX IQ plastic contruction system and adapts it for primary students.

VEX GO KIT

£139.99

Order code 70-6311

VEX GO KIT WITH STORAGE BOXES

£179.99

Order code 70-6277

VEX GO CLASS-ROOM KIT FOR 10 STUDENTS

£899.99

Order code 70-6310

VEX Robotics - Providing the tools to inspire the problem solvers of tomorrow

VEX IQ

Key Stage 2-4

VEX IQ is a snap-together robotics system designed from the ground up to provide novice users the chance to find success quickly, while still being able to constantly challenge more advanced users.

SUPER KIT

- Robot brain, controller, batteries, chargers and cables included

£327.99

Order code 70-7891

CHALLENGE TEAM BUNDLE

The ultimate kit for starting a VEX IQ Team.

£571.30

Order code 70-7953

GROUP BUNDLE

Provides enough equipment to support a group of 10 students working in groups of two.

£1599.99

Order code 70-7950

VEX V5

Key Stage 3-5

The VEX V5 system includes versatile elements that take the frustration out of engineering for novice users, while still providing experienced users with endless design possibilities.

STARTER KIT

Includes all the hardware to build the VEX EDR Clawbot

£549.99

Order code 70-8194

SYSTEM BUNDLE

V5 is the successor to the highly popular VEX EDR Cortex system and boasts masses of new features.

£359.99

Order code 70-8183

COMPETITION STARTER KIT

Take educational robotics to the next level.

£849.99

Order code 70-8196

VEX IQ

COMPETITION		
Order code	**Description**	**Price**
70-7974	VIQC Field Kit - Full 6'x8' Field	£276.97
70-7935	Full Field Perimeter & Tiles	£169.98
70-7936	Half Field Perimeter & Tiles	£84.99
70-8180	Spare Field Tile	£9.99
70-8181	Spare Field Perimeter Wall	£4.99
70-8182	Spare Field Corner Wall	£4.99
70-7938	Highrise Cube Kit	£29.99
70-8212	Challenge 2020-2021 Rise Above Field & Game Element Kit	£89.99
70-6362	VEX Robotics VIQC 2020-2021 Scoring Element Kit	£4.99
70-6302	Field Case	£25.95
70-6299	Think Trophy Plate	£2.09
70-6295	Amaze Trophy Plate	£2.09
70-9976	Challenge Qualifying Event Trophy Pack	£115.49
70-6289	Tournament Trophy Large	£17.84
70-6294	Build Trophy Plate	£2.09

PROGRAMMING		
Order code	**Description**	**Price**
70-7927	USB Cable	£4.99
70-7928	Tether Cable	£4.99

POWER		
Order code	**Description**	**Price**
70-7905	Robot Battery	£19.99
70-7906	Robot Battery Charger	£16.99
70-7909	Controller Battery	£9.99

TOOLS		
Order code	**Description**	**Price**
70-0146	VEX Robotics Pin Tool	£6.95
See online for the full range of VEX tools		

MOTION		
Order code	**Description**	**Price**
70-7925	Wheel Kit	£19.99
70-7924	Gear Kit	£14.99
70-7921	Chain & Sprocket Add-on Kit	£19.99
70-7926	200mm Travel (62mm dia.) Omni Directional Wheels Pack of 2	£9.99
70-7911	Smart Motor	£19.99
70-7922	Tank Tread & Intake Kit	£23.99
70-7919	Shaft Add-On Kit	£9.99
70-7960	Gear Base Pack (Blue)	£5.49
70-7963	Wheel Base Pack (Grey)	£10.99
70-7965	Turntable Base Pack (Grey)	£4.99
70-7966	Pulley Base Pack (Blue)	£5.49
70-7969	Basic Motion Accessory Pack (Black)	£3.99
70-7940	Competition Add-On Kit	£99.99
70-7984	Base Motion Accessory Pack (Blue)	£3.99
70-7986	Turntable Base Pack (Blue)	£4.99
70-8001	Basic Motion Accessory Pack (Red)	£3.99
70-8003	Pulley Base Pack (Red)	£5.49
70-8004	Gear Base Pack (Red)	£5.49
70-8005	Turntable Base Pack (Red)	£4.99
70-8018	Basic Motion Accessory Pack (Orange)	£3.99
70-8020	Pulley Base Pack (Orange)	£5.49
70-8021	Gear Base Pack (Orange)	£5.49
70-8022	Turntable Base Pack (Orange)	£4.99
70-8035	Pulley Base Pack (Black)	£5.49
70-8036	Gear Base Pack (Black)	£5.49
70-8037	Turntable Base Pack (Black)	£4.49
70-8048	Basic Motion Accessory Pack (Purple)	£3.99
70-8050	Pulley Base Pack (Purple)	£5.49
70-8051	Gear Base Pack (Purple)	£5.49
70-8052	Turntable Base Pack (Purple)	£4.99
70-8065	Basic Motion Accessory Pack (Yellow)	£3.99
70-8067	Pulley Base Pack (Yellow)	£5.49
70-8068	Gear Base Pack (Yellow)	£5.49
70-8069	Turntable Base Pack (Yellow)	£4.99
70-8082	Basic Motion Accessory Pack (Green)	£3.99
70-8084	Pulley Base Pack (Green)	£5.49
70-8085	Gear Base Pack (Green)	£5.49
70-8086	Turntable Base Pack (Green)	£4.99
70-8099	Basic Motion Accessory Pack (Pink)	£3.99
70-8101	Pulley Base Pack (Pink)	£5.49
70-8102	Gear Base Pack (Pink)	£5.49
70-8103	Turntable Base Pack (Pink)	£4.99
70-8117	Chain & Sprocket Kit (Red)	£19.99
70-8118	Tank Tread & Intake Kit (Red)	£23.99

MOTION (Continued)		
Order code	**Description**	**Price**
70-8119	Chain & Sprocket Kit (Orange)	£19.99
70-8120	Tank Tread & Intake Kit (Orange)	£23.99
70-8121	Chain & Sprocket Kit (Black)	£19.99
70-8122	Tank Tread & Intake Kit (Black)	£23.99
70-8123	Chain & Sprocket Kit (Purple)	£19.99
70-8124	Tank Tread & Intake Kit (Purple)	£23.99
70-8125	Chain & Sprocket Kit (Yellow)	£19.99
70-8126	Tank Tread & Intake Kit (Yellow)	£23.99
70-8127	Chain & Sprocket Kit (Green)	£19.99
70-8128	Tank Tread & Intake Kit (Green)	£23.99
70-8129	Chain & Sprocket Kit (Pink)	£19.99
70-8130	Tank Tread & Intake Kit (Pink)	£23.99
70-7948	Smart Motor Mount Pack	£4.99
70-7949	Long Shaft Add-on Pack	£9.99
70-7907	Additional Chain Pack 200 Links	£12.99

CONTROLLER		
Order code	**Description**	**Price**
70-7908	Controller	£39.99
70-7904	Robot Brain	£99.99
70-7912	Smart Cable Pack of 6	£9.99
70-7910	2.4 GHz Data Radio	£9.99
70-7947	Smart Radio	£12.99
70-7946	Long Smart Cable(8 Pack)	£19.99
71-0002	200mm Smart Cable (4-Pack)	£4.99

SENSORS		
Order code	**Description**	**Price**
70-7918	Bumper Switch	£4.99
70-7913	Touch LED	£9.99
70-7914	Distance Sensor	£24.99
70-7915	Colour Sensor	£19.99
70-7917	Gyro Sensor	£24.99
70-7931	Storage Bin, Lid, & Tray	£29.99

STRUCTURE

Order code	Description	Price
70-7903	Foundation Add-On Kit	£74.99
70-7920	Connector Pin Pack (Blue)	£9.99
70-7958	Magnetic Beam Pair	£7.99
70-7959	VIQC Blank Team Number Plates	£1.99
70-7961	1x Beam Base Pack (Grey)	£4.99
70-7962	4x Plate Base Pack (Grey)	£4.99
70-7964	Shaft Base Pack	£3.99
70-7967	2x Beam Base Pack (Grey)	£9.99
70-7968	Rubber Shaft Collar (Pk 30)	£5.99
70-7970	Specialty Beam Base Pack (Grey)	£4.99
70-7971	Corner Connector Base Pack (Black)	£8.99
70-7972	Standoff Base Pack (Black)	£5.49
70-7973	4x Plate Foundation Add-On Pack (Grey)	£5.49
71-0001	Vex Standoff Foundation Add-On Pack (Base)	£3.99
70-7975	Corner Connector Foundation Add-On Pack (Black)	£6.99
70-7976	2x Beam Foundation Add-On Pack (Grey)	£5.49
70-7977	1x Beam Foundation Add-On Pack (Grey)	£3.99
70-7978	Plastic Shaft Base Pack (Black)	£7.99
70-7979	1x Beam Base Pack (Blue)	£4.99
70-7980	2x Beam Base Pack (Blue)	£9.99
70-7981	4x Plate Base Pack (Blue)	£4.99
70-7982	Standoff Base Pack (Blue)	£5.49
70-7983	Corner Connector Base Pack (Blue)	£8.99
70-7985	Specialty Beam Base Pack (Blue)	£4.99
70-7987	Plastic Shaft Base Pack (Blue)	£7.99
70-7988	1x Beam Foundation Add-on Pack (Blue)	£3.99
70-7989	2x Beam Foundation Add-on Pack (Blue)	£5.49
70-7990	4x Plate Foundation Add-on Pack (Blue)	£5.49
70-7991	Standoff Foundation Add-on Pack (Blue)	£3.99
70-7992	Corner Connector Foundation Add-on Pack (Blue)	£6.99
70-7993	1x Beam Base Pack (Red)	£4.99
70-7994	2x Beam Base Pack (Red)	£9.99
70-7995	4x Plate Base Pack (Red)	£4.99
70-7996	Connector Pin Pack (Red)	£9.99
70-7997	Standoff Base Pack (Red)	£5.49
70-8159	Corner Connector Base Pack (Red)	£8.99
70-8158	Specialty Beam Base Pack (Red)	£4.99
70-8006	Plastic Shaft Base Pack (Red)	£7.99
70-8007	1x Beam Foundation Add-on Pack (Red)	£3.99
70-8008	2x Beam Foundation Add-on Pack (Red)	£5.49
70-8009	4x Plate Foundation Add-on Pack (Red)	£5.49
70-8010	Standoff Foundation Add-on Pack (Red)	£3.99
70-8011	Corner Connector Foundation Add-on Pack (Red)	£6.99
70-8012	1x Beam Base Pack (Orange)	£4.99
70-8013	2x Beam Base Pack (Orange)	£9.99
70-8014	4x Plate Base Pack (Orange)	£4.99
70-8015	Connector Pin Pack (Orange)	£9.99
70-8016	Standoff Base Pack (Orange)	£5.49
70-8017	Corner Connector Base Pack (Orange)	£8.99
70-8019	Specialty Beam Base Pack (Orange)	£4.99
70-8023	Plastic Shaft Base Pack (Orange)	£7.99
70-8024	1x Beam Foundation Add-on Pack (Orange)	£3.99
70-8025	2x Beam Foundation Add-on Pack (Orange)	£5.49
70-8026	4x Plate Foundation Add-on Pack (Orange)	£5.49
70-8027	Standoff Foundation Add-on Pack (Orange)	£3.99
70-8028	Corner Connector Foundation Add-on Pack (Orange)	£6.99
70-8029	1x Beam Base Pack (Black)	£4.99
70-8030	2x Beam Base Pack (Black)	£9.99
70-8031	4x Plate Base Pack (Black)	£4.99
70-8032	Connector Pin Pack (Black)	£9.99
70-8034	Specialty Beam Base Pack (Black)	£4.99
70-8038	1x Beam Foundation Add-on Pack (Black)	£3.99
70-8039	2x Beam Foundation Add-on Pack (Black)	£5.49
70-8040	4x Plate Foundation Add-on Pack (Black)	£5.49
70-8042	1x Beam Base Pack (Purple)	£4.99
70-8043	2x Beam Base Pack (Purple)	£9.99
70-8044	4x Plate Base Pack (Purple)	£4.99
70-8045	Connector Pin Pack (Purple)	£9.99
70-8046	Standoff Base Pack (Purple)	£5.49
70-8047	Corner Connector Base Pack (Purple)	£8.99
70-8049	Specialty Beam Base Pack (Purple)	£4.99
70-8053	Plastic Shaft Base Pack (Purple)	£7.99
70-8054	1x Beam Foundation Add-on Pack (Purple)	£3.99
70-8055	2x Beam Foundation Add-on Pack (Purple)	£5.49
70-8056	4x Plate Foundation Add-on Pack (Purple)	£5.49
70-8057	Standoff Foundation Add-on Pack (Purple)	£3.99
70-8058	Corner Connector Foundation Add-on Pack (Purple)	£6.99
70-8059	1x Beam Base Pack (Yellow)	£4.99
70-8060	2x Beam Base Pack (Yellow)	£9.99
70-8061	4x Plate Base Pack (Yellow)	£4.99
70-8062	Connector Pin Pack (Yellow)	£9.99
70-8063	Standoff Base Pack (Yellow)	£5.49
70-8087	Plastic Shaft Base Pack (Green)	£7.99
70-8088	1x Beam Foundation Add-on Pack (Green)	£3.99
70-8089	2x Beam Foundation Add-on Pack (Green)	£5.49
70-8090	4x Plate Foundation Add-on Pack (Green)	£5.49
70-8091	Standoff Foundation Add-on Pack (Green)	£3.99
70-8092	Corner Connector Foundation Add-on Pack (Green)	£6.99
70-8093	1x Beam Base Pack (Pink)	£4.99
70-8094	2x Beam Base Pack (Pink)	£9.99
70-8095	4x Plate Base Pack (Pink)	£4.99
70-8096	Connector Pin Pack (Pink)	£9.99
70-8097	Standoff Base Pack (Pink)	£5.49
70-8098	Corner Connector Base Pack (Pink)	£8.99
70-8100	Specialty Beam Base Pack (Pink)	£4.99
70-8104	Plastic Shaft Base Pack (Pink)	£7.99
70-8105	1x Beam Foundation Add-on Pack (Pink)	£3.99
70-8106	2x Beam Foundation Add-on Pack (Pink)	£5.49
70-8107	4x Plate Foundation Add-on Pack (Pink)	£5.49
70-8109	Corner Connector Foundation Add-on Pack (Pink)	£6.99
70-8110	1x Beam Base Pack (White)	£4.99
70-8111	2x Beam Base Pack (White)	£9.99
70-8112	4x Plate Base Pack (White)	£4.99
70-8113	Specialty Beam Base Pack (White)	£4.99
70-8114	1x Beam Foundation Add-on Pack (White)	£3.99
70-8115	2x Beam Foundation Add-on Pack (White)	£5.49
71-0000	Vex 1 x Beam Odd Length pack (Base)	£4.99
70-8131	Large Plate Add-On Pack	£7.99
70-7878	Differential & Bevel Gear Pack	£9.99
70-7879	Universal Joint Pack	£4.99
70-8138	Beam Long Pack (Blue)	£7.99
70-8133	Beam Long Pack (Red)	£7.99
70-8135	Beam Long Pack (Orange)	£7.99
70-8140	Beam Long Pack (Black)	£7.99
70-8139	Beam Long Pack (Purple)	£7.99
70-8136	Beam Long Pack (Yellow)	£7.99
70-8137	Beam Long Pack (Green)	£7.99
70-8134	Beam Long Pack (Pink)	£7.99
70-8141	Beam Long Pack (White)	£7.99

STARTER KITS

Order code	Description	Price
70-7891	Super Kit	£327.99
70-8153	Camp Handbook	£10.49
70-7950	Group Bundle	£1599.99
70-7951	Small Class Bundle	£3268.00
70-7952	Classroom Bundle	£4499.99

For more information visit www.rapidonline.com/VEXIQ

VEX ROBOTICS COMPETITION CHANGE UP

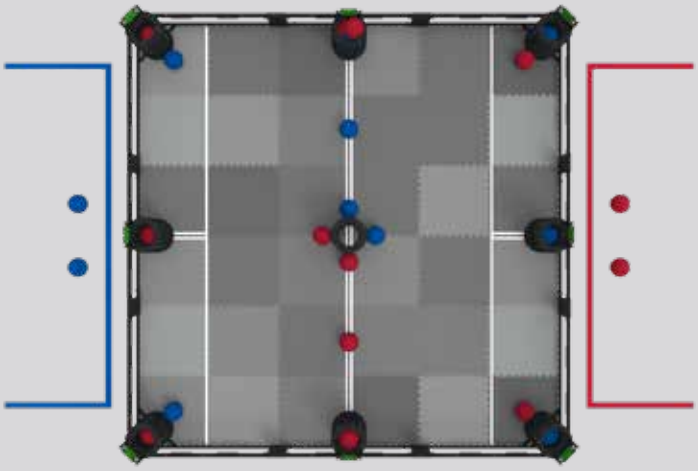
The VEX Robotics Competition is the largest and fastest growing middle school and high school robotics program globally with more than 20,000 teams from 50 countries playing in over 1,700 competitions worldwide. Each year, an exciting engineering challenge is presented in the form of a game. Students, with guidance from their teachers and mentors, build innovative robots and compete year-round.

In addition to learning valuable engineering skills, students gain life skills such as teamwork, perseverance, communication, collaboration, project management and critical thinking. The VEX Robotics Competition prepares students to become future innovators with 95% of participants reporting an increased interest in STEM subject areas and pursuing STEM-related careers.

2020 – 2021 Challenge: Change Up

VEX Robotics Competition Change Up is played on a 12'x12' square field configured as shown. Two Alliances – one "red" and one "blue" – composed of two Teams each, compete in matches consisting of a fifteen second Autonomous Period, followed by a one minute and forty-five second Driver Controlled Period.

The object of the game is to attain a higher score than the opposing Alliance by placing Balls in Goals, and Connecting Rows. Students will need to design, build and program a robot to achieve this task.



VEX Robotics Competition During Covid-19

The Robotics Education and Competition Foundation has worked hard to ensure that the VEX Robotics Competition can continue throughout the Covid-19 pandemic. Modifications include:

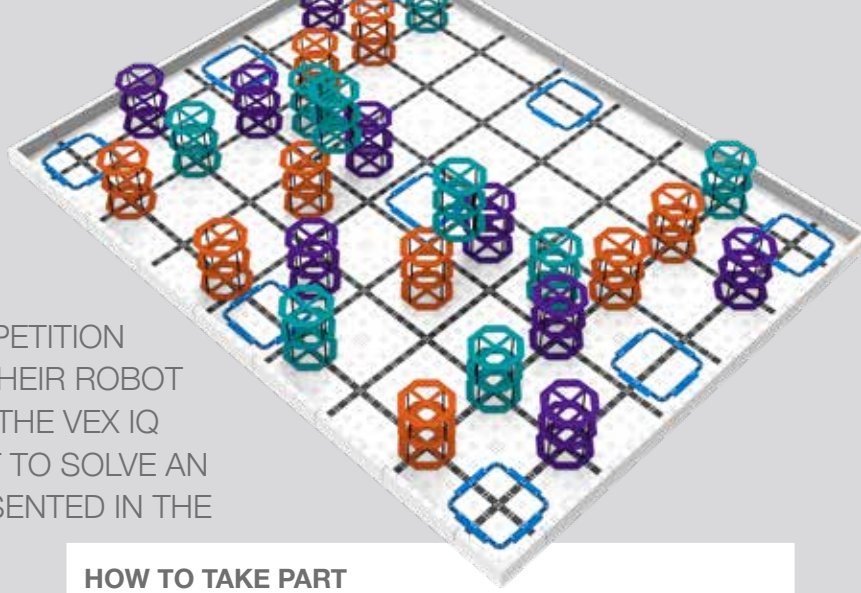
- Rescheduled season to maximise in-person events
- Live Remote system to allow teams to compete over video connection from their own school
- Live Remote practice system to allow teams to practice with other teams from anywhere else in the world
- More online challenges

ROBOTICS EDUCATION & COMPETITION FOUNDATION
REC FOUNDATION

Find out more at www.rapidonline.com/VEX

VEX IQ CHALLENGE

RISE ABOVE



THE VEX IQ CHALLENGE IS A STEM COMPETITION FOR KS2 AND KS3 STUDENTS TO TEST THEIR ROBOT DESIGN AND PROGRAMMING SKILLS. IN THE VEX IQ CHALLENGE, STUDENTS BUILD A ROBOT TO SOLVE AN ENGINEERING CHALLENGE THAT IS PRESENTED IN THE FORM OF A GAME.

The 2020-2021 VEX IQ Challenge game is called Rise Above and it's a bit like three-dimensional noughts and crosses. The idea of the game is to use your robots to place the Risers in matching horizontal, vertical or diagonal rows. Once you have a completed row, you can make your scores even higher by stacking more Risers of the same colour on top of these in the row.

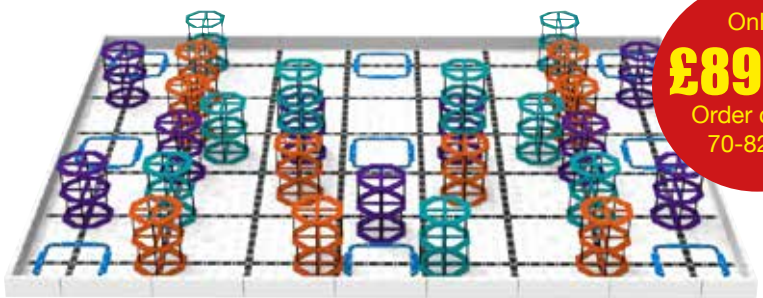
As with all previous years in the VEX IQ Challenge, there are three disciplines to master:

- Teamwork Challenge – you'll be paired with other teams and will need to work together to score as many points as you can
- Driver Skills - set the highest score you can with just your robot on the Field and using your controller
- Programming Skills – program your robot to score points autonomously, no controllers allowed

HOW TO TAKE PART

- Firstly, you'll need a VEX IQ kit. The Super Kit shown on this page is the perfect starting point and contains everything you need to build a robot. The kit is reused year after year.
- Next you'll need a way to program your robot – VEXcode IQ coding software is free and available for Windows, Mac, Chromebook and iOS or Android tablets
- Register a team at **www.robotevents.com** and sign up for events near to you. The 2020-21 season will start later than usual because of the Coronavirus pandemic. For updates, and to find out more about how VEX IQ Challenge events will adapt to these difficult circumstances, contact **education@rapidonline.com**
- Once you have registered a team, you will receive a Welcome Pack containing a Riser to help you design your robot. If you need inspiration for your first robot design, visit **www.rapidonline.com/vexiq** and go to the downloads section for robot build instructions. Rise is recommended for this game.

VEX IQ Challenge Fields



Only **£89.99** Order code 70-8212

Rise Above is the first VEX IQ Challenge game to be played on the new 6' x 8' (1.8 x 2.4m) field. Full fields in the new size are available now. For those who already have 4' x 8' fields, an upgrade kit containing the additional tiles and walls is available.

Having a Field means you can practice on the same surface as you would find at the competitions meaning your driving skills are sharper and your programs are more accurate.

Fields snap together in minutes for easy storage.

Pin Tool

Only **£6.95** Order code 70-0146

The VEX Pin Tool makes working with VEX IQ pins and plastic even easier. Use the Pin Tool just as you would a pair of pliers. Simply place the tool over the pin you want to remove, squeeze, and pull!

The Pin Tool has two other useful features on its handles. One side can be used to pry two beams apart, while the other can be used to push out pins (such as a 0x2 capped connector) that the tool would normally not be able to grab.

VEX V5

STARTER KITS

Order code	Description	Price
70-8194	VEX V5 Classroom Starter Kit	£549.99
70-8195	VEX V5 Classroom Super Kit	£926.30
70-8196	VEX V5 Competition Starter Kit	£849.99
70-8197	VEX V5 Competition Super Kit	£1399.99

COMPETITION

Order code	Description	Price
70-8210	VRC Change Up - Game Element Kit	£64.99
70-8211	VRC Change Up - Field Element Kit	£149.99
70-6366	Robotics Competition Field Perimeter Kit	£679.99
70-8178	Field Perimeter Rubber Foot 20-pk	£9.49
70-6371	VRC Anti-Static Full Field Tile Kit Includes 36 Tiles	£199.99
70-6247	Robotics Competition Field Monitor Stand	£37.49
70-7945	VRC Field Corner Bracket Pk4	£37.49
70-6788	VEXnet Field Controller Kit	£144.99
70-6361	VEXnet Competition Switch	£16.99
70-8147	12" VRC Trophy (Award Plate not Included)	£40.42
70-8149	Blank Award Plate	£5.24
70-6292	On Field Robot Sizing Tool	£37.49
70-6364	VEX Classroom Competition Field Kit	£424.99

CABLES

Order code	Description	Price
70-6227	3-Wire Extension Cable 150mm Pk 4	£3.87
70-6226	3-Wire Extension Cable 300mm Pk 4	£7.75
70-6225	3-Wire Extension Cable 600mm Pk 4	£7.75
70-6281	3-Wire Extension Cable 900mmPk 4	£7.75
70-6224	3-Wire Extension Cables Large Bundle	£14.49
70-6220	3-Wire Extension Cables Small Bundle	£3.87
70-6223	3-Wire Y-Cable 150mm Pack of 2	£3.87
70-7955	Extension Cable Retaining Clip (10-pack)	£2.88
70-6249	Serial Y-Cable	£4.44
70-9972	V5 Cable Crimp Tool	£18.99
70-9973	V5 Smart Cable 8m Length	£5.99
70-9974	V5 Smart Cable Connectors Pack of 50	£2.99
70-8192	V5 Smart Cable Starter Pack	£4.99
70-8999	V5 Smart Cables (Long Assortment)	£9.99

POWER

Order code	Description	Price
70-8199	V5 Power Cable Assortment	£27.99
70-8188	V5 Robot Battery	£46.99
70-8190	V5 Battery Charger Adapter - UK (Type G)	£0.83
70-8189	V5 Robot Battery Charger	£9.99

MOTION

Order code	Description	Price
70-8185	V5 Smart Motor	£33.99
70-0032	V5 Motor 18:1 Cartridge Green (200 RPM)	£9.99
70-0031	V5 Motor 36:1 Cartridge Red (100 RPM)	£9.99
70-0033	V5 Motor 6:1 Cartridge Blue (600 RPM)	£9.99
70-6276	70mm (2.75inch) Omni Directional Wheel - Double Roller (Pack of 2)	£18.99
70-6211	3.25" Omni-Directional Wheel Pk4	£37.49
70-6323	100mm (4 inch) Omni-Directional Wheel (Pack of 2)	£23.49
70-6238	2.75" Wheel Pack of 4	£9.49
70-6212	3.25" Traction Wheel Pk4	£18.99
70-6239	4" Wheel Pack of 4	£18.99
70-6236	4" High Traction Tyre Pack of 4	£12.49
70-6234	Mecanum Wheel 100mm (4 inch) - pack of 4	£54.99
70-6338	152mm (6 Inch) Wheel Leg Pack 4	£23.49
70-8176	High Strength 36-Tooth Gear (8-pack)	£12.49
70-8177	High Strength 60-Tooth Gear (8-pack)	£14.49
70-6168	High Strength 84-Tooth Gear Pk4	£12.49
70-6345	High Strength Gear Kit	£18.99
70-6346	Metal 12-Tooth Pinions Pk12	£18.99
70-6309	Standard Gear Kit	£12.49
70-6155	Bevel Gearbox Bracket Pk 2	£9.49
70-6214	Flat Bearing Block Pk10	£4.75
70-6285	Pillow Block Bearing & Lock Bar Pack	£7.75
70-6283	Drive Shaft 50.8mm & 76.2mm Pack 8	£4.99
70-6208	Drive Shafts 305mm (12inch) Pack 4	£8.49
70-6122	Drive Shaft Bar Lock (Pk 8)	£5.99
70-6282	Shaft Collar Pack of 16	£7.75
70-6173	Clamping Shaft Collar Pk10	£4.75
70-6123	Nylon Spacer Variety Pack	£4.75
70-6286	Spacer 4.6mm Pack of 20	£2.99
70-6287	Spacer 8mm Pack of 20	£2.99
70-6274	Shaft Coupler Pack of 5	£4.75
70-6266	High Strength Shaft Bearing Pk10	£7.75

MOTION (Continued)

Order code	Description	Price
70-6379	High Strength Shaft 50mm (2") Pk4	£4.75
70-6380	High Strength Shaft 76mm (3") Pk4	£4.75
70-6381	High Strength Shaft 100mm (4") Pk4	£4.99
70-6382	High Strength Shaft 305mm (12") Pk4	£14.49
70-6267	High Strength Shaft Spacer Kit	£9.49
70-6422	High Strength Clamping Shaft Collar Pk10	£9.49
70-6387	High Strength Sprocket 6 Tooth (8-Pack)	£12.49
70-6388	High Strength Sprocket 12 Tooth (4-Pack)	£12.49
70-6389	High Strength Sprocket 18 Tooth (4-Pack)	£12.49
70-6390	High Strength Sprocket 24 Tooth (4-Pack)	£12.49
70-6391	High Strength Sprocket 30 Tooth (4-Pack)	£12.49
70-6347	High Strength Sprocket & Chain Kit	£37.49
70-6321	Additional Chain	£23.49
70-6307	Sprocket & Chain Kit	£27.99
70-6308	Tank Tread Kit	£27.99
70-6335	Tank Tread Upgrade Kit	£23.49
70-6322	Advanced Gear Kit	£18.99
70-6291	Advanced Mechanics and Motion Kit	£23.49
70-8160	Rack Gear (16-pack)	£18.99
70-6156	Rack Gearbox Bracket v2 (2-pack)	£9.97
70-6473	Standoff 101.00mm (4.00in) Pack of 4	£7.75
70-6333	Claw Kit	£18.99
70-6241	Intake Roller Pack of 8	£12.49
70-7956	Linear Motion Additional Truck Kit	£9.49
70-6428	Linear Motion Kit	£23.49
70-6272	Turntable Bearing Kit	£18.99
70-6243	Winch and Pulley Kit	£14.49
70-6076	Pneumatics Kit 1 - Single Acting Cylinders	£169.99
70-6077	Pneumatics Kit 1A - Single Acting Cylinder Add-On	£54.99
70-6078	Pneumatics Kit 2 - Double Acting Cylinders	£209.99
70-6079	Pneumatics Kit 2A - Double Acting Cylinder Add-On	£84.99
70-6193	Solenoid Driver Cable Pack of 2	£27.99
70-6080	1.5m Pneumatics Tubing Compatible	£4.75

CONTROL

Order code	Description	Price
70-8186	V5 Robot Brain	£229.99
70-8191	V5 Robot Radio	£37.49
70-8187	V5 Wireless Controller	£93.49

TOOLS

Order code	Description	Price
70-6112	3/32in Hex Keys Pack of 8	£4.99
70-6113	5/64in Hex Keys Pack of 8	£4.99
70-6255	Performance Tool Kit Set of 15	£37.49
70-6386	Robotics Engineering Notebook	£9.49
70-6315	Safety Glasses	£7.75
70-7886	T15 Star Drive Keys (8-Pack)	£7.75
70-8179	T15 Star Screwdriver (5-Pack)	£14.49
70-7887	T8 Star Drive Keys (8-Pack)	£7.75
70-7885	T8 Star Screwdriver (5-Pack)	£14.49
70-6471	Wrench and Hex Key Set	£2.99

NUTS, BOLTS & FIXINGS

Order code	Description	Price
70-6217	Replacement Grub Screw Pk of 32	£4.75
70-1198	8-32 x 0.125" Star Drive Set Scew - 32 Pack	£4.75
70-6143	Button Head Screw 6-32 x 12.7mm (0.5in) Pack of 50	£4.75
70-6081	Button Head Screw 6-32 x 6.35mm (0.25in) Pack of 50	£4.75
70-6280	Locking Screw 6-32 x 0.500in Pack of 100	£9.49
70-6178	Screw 8-32 x 0.250" Locking Pack of 100	£18.99
70-6179	Screw 8-32 x 0.500 " Locking Pack of 100	£18.99
70-6084	Button Head Hex Drive Screw 8-32 x 6.35mm (0.25in) Pack of 100	£7.49
70-6085	Button Head Hex Drive Screw 8-32 x 9.525mm (0.375in) Pack of 100	£7.49
70-6086	Button Head Hex Drive Screw 8-32 x 12.7mm (0.5in) Pack of 100	£7.49
70-6087	Button Head Hex Drive Screw 8-32 x 15.875mm (0.625in) Pack of 100	£9.49
70-6088	Button Head Hex Drive Screw 8-32 x 19.05mm (0.75in) Pack of 100	£9.49
70-6089	Button Head Hex Drive Screw 8-32 x 22.225mm (0.875in) Pack of 100	£9.49
70-6090	Button Head Hex Drive Screw 8-32 x 25.4mm (1in) Pack of 100	£9.49
70-6091	Button Head Hex Drive Screw 8-32 x 31.75mm (1.25in) Pack of 50	£7.49
70-6092	Button Head Hex Drive Screw 8-32 x 38.1mm (1.5in) Pack of 50	£7.49
70-6093	Button Head Hex Drive Screw 8-32 x 44.45mm (1.75in) Pack of 50	£9.49
70-6094	Button Head Hex Drive Screw 8-32 x 50.8mm (2in) Pack of 25	£7.49
70-8174	Star Drive Screw 8-32 x 0.250" Locking (100-pack)	£9.49
70-8175	Star Drive Screw 8-32 x 0.500" Locking (100-pack)	£9.49
70-8163	Star Drive Screw 8-32 x 0.250" (100-pack)	£4.75
70-8164	Star Drive Screw 8-32 x 0.375" (100-pack)	£4.75
70-8165	Star Drive Screw 8-32 x 0.500" (100-pack)	£4.75
70-8166	Star Drive Screw 8-32 x 0.625" (100-pack)	£5.49
70-8167	Star Drive Screw 8-32 x 0.750" (100-pack)	£5.49
70-8168	Star Drive Screw 8-32 x 0.875" (100-pack)	£6.75
70-8169	Star Drive Screw 8-32 x 1.000" (100-pack)	£6.75
70-8170	Star Drive Screw 8-32 x 1.250" (50-pack)	£4.75
70-8171	Star Drive Screw 8-32 x 1.500" (50-pack)	£4.75
70-8172	Star Drive Screw 8-32 x 1.750" (50-pack)	£5.49
70-8173	Star Drive Screw 8-32 x 2.000" (25-pack)	£4.75
70-6200	Plastic 8-32 Thumbscrew Pk of 50	£9.49
70-6222	Shoulder Screws 8-32 Pack of 25	£9.49
70-6106	Steel Washer Pack of 200	£4.75
70-6107	Teflon Washer Pack of 25	£4.75
70-6110	Nut 8-32 Hex Nut Pack of 100	£2.99
70-6108	Nut 8-32 Keps Nut Pack of 100	£2.99
70-6109	Nut 8-32 Nylock Nut Pack of 100	£3.75
70-6095	Standoff 6.35mm (0.25in) Pack of 10	£2.99
70-6096	Standoff 12.70mm (0.50in) Pack of 10	£2.99

NUTS, BOLTS & FIXINGS (Continued)

Order code	Description	Price
70-6096	Standoff 12.70mm (0.50in) Pack of 10	£2.99
70-6098	Standoff 25.40mm (1.00in) Pack of 10	£3.75
70-6099	Standoff 38.10mm (1.50in) Pack of 10	£7.75
70-6100	Standoff 50.80mm (2.00in) Pack of 10	£7.75
70-6101	Standoff 63.50mm (2.50in) Pack of 4	£5.49
70-6102	Standoff 76.20mm (3.00in) Pack of 4	£6.75
70-6104	Standoff 127.00mm (5.00in) Pack of 4	£8.49
70-6105	Standoff 152.00mm (6.00in) Pack of 4	£9.49
70-6284	Standoff Assorted Pack	£14.99
70-6082	Standoff Coupler 12.7mm (0.5 inch) Pack 25	£2.99
70-6083	Standoff Coupler 25.4mm (1 inch) Pack 25	£4.75
70-8162	Star Drive Coupler 8-32 x 0.500 (25-pack)	£1.99
70-8161	Star Drive Coupler 8-32 x 1.000 (25-pack)	£2.99
70-6124	Rubber Bands Pack 20	£1.99
70-6111	Rubber Links Pack of 4	£7.49
70-6172	Double Sided Hook & Loop Strip 1524mm (5ft.)	£4.75
70-6170	Hook & Loop Adhesive Strip (5')	£9.49
70-6336	Bearing Pop Rivets Pk50	£7.75

STRUCTURE

Order code	Description	Price
70-6350	Aluminium C-Channel 1x2x1x25 Pack 6	£27.99
70-6351	Aluminium C-Channel 1x2x1x35 Pack 6	£33.99
70-7957	Aluminium C-Channel 1x3x1x35 Pack 6	£33.99
70-6352	Aluminium C-Channel 1x5x1x25 Pack 6	£37.49
70-6353	Aluminium C-Channel 1x5x1x35 Pack 6	£42.49
70-6354	Aluminium Angle 2x2x35 Pack 6	£33.99
70-6355	Aluminium Bar 1x25 Pack 16	£27.99
70-6356	Aluminium Plate 25x5 Pack 6	£23.49
70-6125	Standard Aluminium Structure Kit	£76.99
70-6189	Long Aluminium Structure Kit	£76.99
70-6166	C-Channel 1x2x1x35 Pack of 2	£8.49
70-6133	C-Channel 1x5x1x25 Pack of 4	£16.99
70-6134	C-Channel 1x5x1x35 Pack of 4	£18.99
70-6137	Angle 2x2x25 Pack of 4	£14.49
70-6138	Angle 2x2x35 Pack of 4	£16.99
70-6139	Angle 3x3x35 Pack of 4	£18.99
70-6136	Bar 1x25 Pack of 8	£12.49
70-6202	Plate 15x5 Pack of 2	£4.75
70-6135	Plate 25x5 Pack of 4	£14.49
70-6216	Base Plate 30x15 Pack of 2	£27.99
70-6140	Chassis Rail 2x1x25 Pk4	£14.49
70-6141	Chassis Rail 2x1x35 Pk4	£16.99
70-6115	Chassis Kit Large 35x35 holes	£23.99
70-6288	Chassis Kit Small 15x16	£18.99
70-6394	C-Channel Coupler Gusset (8-pack)	£18.99
70-6152	45 Degree Gusset Pk 6	£4.75
70-6396	90-Degree Gusset Set (4-pack)	£12.49
70-6395	Angle Corner Gusset (4-pack)	£18.99

STRUCTURE (Continued)

Order code	Description	Price
70-6397	Angle Coupler Gusset (8-pack)	£18.99
70-6207	Assorted Gusset Pack - pack of 6 - 2x Angle, 2x Plus, 2x Pivot	£7.49
70-6186	Hinges Pk2	£9.49
70-6169	Adhesive Foam	£9.49
70-6171	Cinch Strap (5-pack)	£9.49
70-6180	Latex Tubing	£9.49
70-6073	Thick Anti-slip Mat 304mm x 380mm	£2.49
70-6074	Thin Anti-slip Mat 304mm x 380mm	£2.49
70-6341	VEX Booster Kit	£169.99

CORTEX LEGACY PRODUCTS

Order code	Description	Price
70-6331	VEX Clawbot Kit (Cortex NOT included)	£144.99
70-6303	VEX Metal & Hardware Kit	£76.99
70-6147	Advanced Sensor Kit	£93.49
70-6359	Analogue Accelerometer V1.0	£37.49
70-6301	Bumper Switch Pack of 2	£10.19
70-6393	Flashlight	£12.49
70-6316	LED Indicator Pack	£7.74
70-6300	Light Sensor	£10.81
70-6314	Limit Switch Pack of 2	£12.49
70-6296	Line Tracker	£37.49
70-6298	Optical Shaft Encoder Pack of 2	£18.99
70-6337	Potentiometer Pack of 2	£12.49
70-6297	Ultrasonic Range Finder	£22.84
70-8154	V5 Inertial Sensor	£37.13
70-8198	V5 Vision Sensor	£67.99
70-6231	2-Wire Extension Cable 305mm Pk 4	£6.32
70-6230	2-Wire Extension Cable 610mm Pk 4	£6.32
70-6229	2-Wire Extension Cable 915mm Pk 4	£7.75
70-6228	2-Wire Extension Cable Bundle	£7.74
70-6329	29 Type Motor Controller	£9.49
70-6317	2-Wire Motor 393	£14.49
70-6273	Motor 393 Replacement Gears	£3.85
70-6252	Coiled Handset Cable	£3.60
70-6330	Cortex Microcontroller	£209.99
70-6313	Cortex Wire Retaining Clips	£3.06
70-6218	Jumper Clip Pack of 5	£1.99
70-6275	Partner Joystick	£27.99
70-6328	Robotics VEXnet Joystick	£144.99
70-6071	VEXnet Key 2.0	£37.49
70-6253	VEXnet System Bundle	£349.99
70-6213	USB Programming Hardware Kit	£38.35
70-6260	AAA Batteries for VEXnet Joystick	£10.19
70-6254	AAA Battery Charger	£25.49
70-7954	Battery Clip (4-pack)	£2.88
70-6269	Battery Extension Cable	£4.75
70-6339	Battery Strap Pack of 2	£4.75
70-6348	Power Expander	£38.35
70-6233	Smart Charger V2	£15.99
70-6342	VEXnet Backup Battery Holder	£9.49

For more information visit www.rapidonline.com/VEXV5

Robotic Arms

DOBOT
M1 4-Axis Cooperative Robotic Arm

The Dobot M1 is a cost-effective robotic arm suitable for light industrial use as part of an intelligent industrial system.

The M1's high precision, wide working range, complete functions and secondary development ability, make it suitable for multiple types of assembly line work such as soldering, visual recognition and PCB loading.

No complex installation is required, the M1 can be connected just in one step. It's lightweight design means that it can be installed or moved by a single person.

With a repetitive positioning accuracy of up to 0.02mm, a maximum working range of 400mm and a maximum load of 1.5kg, the M1 is a serious and effective lightweight industrial robotic arm.

A standardized intelligent interface and open programming language make the M1 highly adaptable. With a range of different accessories, M1 can perform many diverse functions in an industrial environment.

Package includes:

- M1 robotic arm with AC power cable, PSU and DC power cable
- 4-pin connector
- Emergency stop switch kit
- DB9 serial cable
- Network cable
- M3x10 screws and 2.5mm key
- Suction cup, air pump, air tube & 4-pin connector
- Gripper
- Pen holder & pen
- **Dobot type M1**

Base not included.

Note: *For professional use only. Please note that no 3D Printing or Laser Engraving accessories are included in this package.*

Type	Order code	1+
M1 robotic arm	**70-0484**	4027.76

567743

DOBOT
Magician Robotic Arm

Meet **Dobot Magician** - the desktop robotic arm with incredible **accuracy** and repeatability. Dobot is **versatile** - it can be controlled via a PC, remote control, gesture control or programmed to operate as a standalone unit.

Dobot Magician's control software is called DobotStudio. It has a wealth of integrated features including Teach and Playback mode (no coding required!), graphical programming via Blockly and text programming. Dobot can also be controlled via a Leap Motion gesture control unit, remote joystick and via Bluetooth or WiFi.

Because Dobot's movements are so accurate, it is an excellent way to learn about control, automation and how industrial robots work without the need for large machinery.

Dobot comes at just a fraction of the size and cost of its industrial equivalent making it **ideal for the classroom** environment. Dobot also offers a large amount of flexibility through its Extended Input and Output (EIO) ports which allow users to connect their own sensors, motors, servos or additional microcontrollers.

- Number of axes 4
- Maximum payload 500g
- Maximum reach 320mm
- Position accuracy 0.2mm
- Robot power supply 12V/7A
- Power consumption 60W maximum
- Weight 3.4kg
- Base footprint 158 x 158mm
- Made from aluminium alloy and ABS
- DC Power adaptor (included) 100 to 240V AC, 50/60Hz

Supplied with everything you need to use Dobot: *Dobot Magician robot arm; power supply; 3 different end effectors - claw, suction cup and pen; USB cable; WiFi module; bluetooth module; joystick remote control; DobotStudio software. This version does not include a laser engraver or 3D print extruder.*

Type	Order code	1+
Robotic arm	**70-0480**	919.05

564463

DOBOT
Sliding Rail Kit

An extra metre brings you endless possibilities!

As Dobot Magician's official accessory, the sliding rail kit expands its functional area to a whole new extent. With interchangeable tool heads and graphical programming environment, you'll design complicated workflows like a pro.

From organizing objects, to writing a long letter, this simple accessory will make industry 4.0 approachable like never before. The rail is made from a single piece of steel using high precision CNC milling. And it runs like silk.

The sliding rail is supplied with wire set, tool kit, attachments and assembly instructions.

Specifications

- Max. payload: 5kg
- Effective travel distance: 1000mm
- Maximum speed: 150mm/s
- Maximum acceleration: 150mm/s²
- Repeat positioning accuracy: 0.01mm
- Absolute positioning accuracy: 0.25mm
- Dimensions (L x W x H): 132 x 120 x 55mm
- Weight: 4.7kg

Dobot not included.

Type	Order code	1+
Sliding rail kit	**70-0481**	877.03

565241

DOBOT
Conveyor Belt Kit

The simplest mini production line ever.

The conveyor kit for the Dobot Magician gives you a complete production line simulation. The kit consists of a conveyor belt with adjustable speed, a distance sensor and a colour sensor. Combined with the powerful and programmable Dobot Magician, these are the ideal essentials for you to create a highly effective simulated production line, or even apply it to an actual factory scenario.

The conveyor belt is supplied complete with 40 wooden cubes, a demonstration positioning board and user manual.

Conveyor belt

- Max. payload: 500g
- Effective delivering distance: 600mm
- Maximum speed: 120mm/s
- Maximum acceleration: 1100mm/s²
- Dimensions: 700 x 215 x 60mm
- Weight: 4.2kg

Dobot not included.

Distance measuring sensor unit

- Measurable range: 20 to 150mm
- Signal: analog output
- Input: 4.5 to 5.5V

Colour recognising sensor unit

- Input: 3 to 5V
- Detectable: non-glowing object
- White LED embedded, on/off controllable

Type	Order code	1+
Conveyor belt kit	**70-0482**	308.80

565242

Pricing

Pricing correct at time of going to press. For up-to-date pricing visit **www.rapidonline.com**

Robotic Arm and Optional USB PC Interface

This Robot Arm helps you get to grips, literally, with the basics of robotic technology. Following the detailed instructions, you can build your own wire-controlled Robot Arm, and control its movements via the remote control box. Alternatively, you can operate the Robot Arm from your PC by installing the optional USB Interface Kit (sold separately). The robot has 5 motors and 5 joints and features base rotation, elbow and wrist motion and a gripping function. A built-in searchlight means you can even operate the Robot Arm in the dark.

- Educational kit includes all necessary parts (except tools)
- Supplied complete with wired hand controller
- Add the optional USB interface and software (sold separately) to control your robotic arm from your PC
- No soldering required
- Maximum lift 100g
- Dimensions 37.5 x 16.1 x 23cm
- Weight 658g
- Requires 4x D batteries (not supplied)
- Optional USB Interface Kit is compatible with Windows Vista, Windows® XP and Windows® 7

Not suitable for children under 5 due to inclusion of small parts

Type	Order code	1+
Robotic arm	**06-9349**	23.34
USB interface	**06-9350**	19.47

518239

406-4202 Robotic Arm by HEXBUG

How do industrial robots - the kind that are used on assembly lines - actually work?

Now you can unlock the secrets ofthese sophisticated machines by building one of your own! The VEX® Robotics Robotic Arm is a completely functional construction kit inspired by real industrial robot arms. It is hand-powered and can pick up and relocate items using four degrees of freedom and an articulated grabber hand. The whole crane can rotate through 360°, allowing it to perform the complex actions of its real-life counterpart.

Children and robotics enthusiasts alike will have fun building this STEM-based kit that pays special attention to important scientific principals including gear reductions and power transfer through the robotic arm's intricate gearing.

HEXBUG® hopes to inspire future generations of engineers and designers by allowing them to explore this exciting field through the fun of hands-on creative play.

- Over 350 pieces
- Pick up objects with the expandable claw
- 140mm (5.5in) grip
- Four points of motion
- Two alternate builds - Chopper and Scorpion
- Complaint with CPSIA standards
- No batteries required
- Suitable for age 8 years and up

A motorised version of the Robotic Arm is also available, please see order code **70-0397**.

Type	Order code	1+
Robotic arm	**70-0389**	24.99

564493

406-4323 Motorised Robotic Arm by HEXBUG

How do industrial robots - the kind that are used on assembly lines - actually work?

Now you can unlock the secrets of these sophisticated machines by building one of your own! The VEX® Robotics Motorised Robotic Arm is a completely functional construction kit inspired by real industrial robot arms. It is operated by four battery-powered motors and can pick up and relocate items using four degrees of freedom and an articulated grabber hand. The whole crane can rotate through 360°, allowing it to perform the complex actions of its real-life counterpart.

Children and robotics enthusiasts alike will have fun building this STEM-based kit that pays special attention to important scientific principals including gear reductions and power transfer through the robotic arm's intricate gearing.

HEXBUG® hopes to inspire future generations of engineers and designers by allowing them to explore this exciting field through the fun of hands-on creative play.

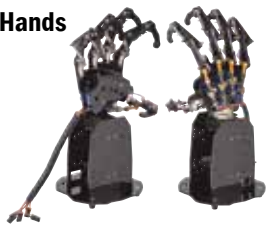
- Motorised version
- Over 350 pieces
- Pick up objects with the expandable claw
- 140mm (5.5in) grip
- Four points of motion
- Two alternate builds - Chopper and Scorpion
- Complaint with CPSIA standards
- Takes 3x C batteries (not included)
- Suitable for age 8 years and up

A hand operated version of the Robotic Arm is also available. Please see order code **70-0389**.

Type	Order code	1+
Motorised robotic arm	**70-0397**	74.99

564501

Bionic Robot Hands



These bionic robot hands are made from acrylic material and each have 5 micro metal servos, joints and a base.

Their special mechanical structure allows every finger or thumb to be controlled separately within its range. Each digit has a spring damping structure that protects it from excessive mechanical stress. With its 24-channel servo driver, all actions can be controlled via PC software, supporting online debug and wireless control.

The bionic robot hands can be controlled by Arduino and other Servo controllers. It can grasp a 500g object and it is the best option for DIY robot hand demonstrations. The servos can be connected directly to the Arduino IO expansion shield or the Romeo robot microcontroller.

- Each digit can be controlled separately
- Special spring damping structure for effective protection
- Acrylic material
- Lightweight, weigh less than 900g
- Ready assembled
- Compatible with Arduino and other microcontrollers
- Requires a 5V, 2A power supply (not included)
- Available in left and right hand versions

Type	Order code	1+
Right	**75-0215**	156.77
Left	**75-0216**	172.89

568391

RA1-PRO Metallic Programmable Robot Arm Kit

The Arexx big metal Robot Arm is ideally suited for school and educational projects and helps to learn the basics of electronics, mechanics and programming.

The robot arm is controlled by a powerful ATMEGA64 microcontroller that is programmable via Open Source Tools in C. The user can upload his own programs simply and easily via the supplied USB interface and the Uploader software. The I/O inputs and outputs together with the flexible I2C bus system allow the addition of extra modules, enabling the robot to react to its environment.

Pack includes: - Complete Robot Arm construction set (mechanics and electronics), USB interface with lead and CD-ROM containing all required software and manuals.

What can be done with the Robot Arm?

- Transfer example and new programs into the Robot Arm
- Control the Robot Arm via a keyboard
- Control and program the Robot Arm via the RACS software
- Extend the Robot Arm with ready-to-use extension modules so that it can hear, feel and see in order to react to its environment
- Just like genuine robots can build e.g. cars, this robot can also do some tasks for you
- The Robot Arm can communicate with its environment and many other units through its I2C interface
- Artificial intelligence: The Robot Arm improves its software automatically through its self-learning software
- **Arexx type RA1-PRO**

Type	Order code	1+
Metallic robot arm	**64-0733**	231.57

562066

Mini Programmable Robot Arm

The Arexx Mini Robot Arm is an affordable robot for the hobbyist. It is ideally suited to learning the basics of electronics, mechanics and programming. The robot arm is controlled by a powerful ATMEGA64 microcontroller that is programmable via Open Source Tools in C. The user can upload his own programs simply and easily via the supplied USB interface and the Uploader software. The I/O inputs and outputs together with the flexible I2C bus system allow the addition of extra modules enabling the robot to react to its environment.

Pack includes: - Complete Robot Arm construction set (mechanics and electronics), USB interface with lead and CD-ROM containing all required software and manuals.

What can we do with the Robot Arm?

- Transfer example and new programs into the Robot Arm
- Control the Robot Arm via a keyboard
- Control and program the Robot Arm via the RACS software
- Extend the Robot Arm with ready-to-use extension modules so that it can hear, feel and see in order to react to its environment
- Just as genuine robots can build e.g. cars, this robot can also do some tasks for you
- The Robot Arm can communicate with its environment and many other units via its I2C interface
- Artificial intelligence: The Robot Arm improves its software automatically via its self-learning software

Type	Order code	1+
Mini robot arm	**13-1417**	104.11

519538

micro:bit Robots

Robo:Bit for BBC micro:bit and Accessories

If you have a **BBC micro:bit** then you should get the Robo:Bit buggy. Using the basic kit, you can learn about controlling motors and use the accelerometers or compass on the micro:bit to aid navigation and collision detection. You can also make a very cool remote control robot by using another micro:bit and the radio function.

The **Robo:Bit buggy** can be assembled very quickly using only a screwdriver. No soldering is required making it a great beginners kit and the chunky wheels and powerful motors mean it works well on any surface.

There are also available a number of optional accessories to make the Robo:Bit buggy even more versatile:

The **Ultrasonic Distance Sensor** lets the robot detect objects before it collides with them allowing you to program it to avoid them. It can also be used to create a 'follow me' program where the robot tries to stay a certain distance from the object in front of it.

The **Line Follower Sensor Pack** uses two line sensors to follow a black line and keep the buggy on track. You can write more complex programs that behave as required when you meet a T-junction or crossroads.

We all like adding blinky LEDs to our electronic creations, whether it is a robot, weather station or something that reads and displays sensor data. Now with **McRoboFace** you can add emotions to everything at the same time as adding blinkies. It also comes in grey or white.

All the 17 RGB LEDs are fully addressable and can be controlled by most processors in the field using standard 'neopixel' code. This includes Raspberry Pi, Crumble, Arduino, ESP8266, micro:bit and Codebug.

The **Robo:Bit** robotics controller is a ready-assembled robotics controller board that's ready to be used with your **BBC micro:bit**, just add battery power (3 or 4 AA is ideal, but not included) and motors of your choice to make your own DIY robot. Use a small box, ice-cream carton or similar to house everything and you can build a really affordable robot for your school, coding club or home.

Robo:Bit has been cleverly designed so that with a few hexagonal pillars and screws, you can fit the motors, battery box, front casters, line following sensors and even ultrasonic distance sensors and have a very neat and simple robot!

Robo:Bit uses the ever popular DRV8833 motor driver which allows you to use most small motors that operate in the 3 to 6V range.

Connections are provided for lots of the BBC micro:bit pins, and all have immediate 3-pin access to power (3.3V) and ground. There are three separate pins for 5V if you need the extra voltage (but don't feed back 5V to the micro:bit as it won't like it!). This is the GVS (Ground, Volts, Signal) system for sensors and servos etc.

On the left side of the board (the 'front' of the robot) is a set of 4 offset holes into which you can simply poke an HC-SR04 ultrasonic distance sensor. The offset holes and gold plating ensure a good connection, but you can also solder it in permanently for added robustness.

The Robo:Bit fixings pack contains screws, hexagonal pillars and a Pololu caster. This allows you to fit standard yellow motors (not included) and immediately get a robot working.

Also available is the **Talon Grabber** (75-5008) that has a jaw that can be controlled using standard servo code, as well as the specific code added to the Bit:Bot package.

Also available is the **Robo:Bit MK3** (75-5014) that includes, along with the buggy, the line following sensor, ultrasonic distance sensor, integrated pen holder, and the LED light bar.

- Have fun and learn robotics at the same time
- Quick to assemble with just a screwdriver
- Chunky wheels and powerful motor
- Ideal for many projects
- Batteries and micro:bit sold separately

Type	Order code	1+
Robo:Bit Buggy MK3	**75-5014**	27.18
Line sensor	**75-0127**	5.00
McRoboFace white	**75-0147**	6.50
HC-SR04 v2	**75-0146**	3.50
Talon/grabber	**75-5008**	10.00

565005

Raspberry Pi Robots

Ultimate Initio 4WD Robot Platform for Raspberry Pi with RoboHAT

The **Ultimate Initio** is a 4WD robot platform that is ideal for use with **Raspberry Pi** single board computer. The platform is a doddle to assemble and easy to use and comes with the RoboHAT robotics board and an assembled 2DOF pan-tilt servo assembly, as well as a number of other sensors that make this platform extremely flexible and perfect for a wide range of projects.

The main chassis comes pre-built, with the wheels, motors, gearboxes, battery box, wheel sensors all in place. The powerful 170-size motor is is coupled to a high-quality gearbox and there are built-in speed encoders on each side. Each wheel can be individually decoupled from the gearbox so you can run the robot in 1WD, 2WD or 3WD modes if you want.

Kit contents:

- Main Initio chassis (with wheels, motors, gearboxes, battery box, wheel sensors, screws and all mountings)
- **RoboHAT** Robotics Controller Board **75-0824**
- Pan-Tilt 2DOF assembly with servos (ready assembled)
- 2x IR Obstacle sensors
- 2x IR Line sensors
- 1x Ultrasonic sensor
- All connecting cables as required for above items
- Build instructions and example code can be found on the **4tronix** website

- Ideal for line following projects
- 6-cell battery box with switch (batteries not supplied)
- No soldering or gluing required
- Wiring already assembled
- Fixings for replacement stepper motors (not included)
- Injection moulded from tough ABS
- Includes mountings for additional boards and sensors
- Wheel size ø55 x 28mm
- Chassis size 180 x 120 x 93mm
- Height of top plate with wheels attached 110mm

Note: *Raspberry Pi not included.* **Note**: *Batteries not included.*

Type	Order code	1+
Ultimate Initio	**75-0282**	76.50

565325

Robot Chassis

2WD & 4WD Servo Robot Platforms

The **2WD and 4WD Robot Platforms from Rapid** give you the opportunity to build a simple robot at a bargain price. They're based around an anodised aluminium chassis which is pre-cut for servos. The chassis also has a useful set of mounting holes and slots for additional hardware such as a microcontroller or sensors. These platforms are compatible with any microcontroller such as the Arduino, OrangePip, PICAXE, Genie and others, as **servos do not require additional motor drivers**.

All the parts for the platform are included in the box: 1 x anodised aluminium chassis, screws and nuts, just add your own microcontroller. The 2WD platform also includes 2 x servos, 2 x wheels with tyres, and 1 x castor. The 4WD platform also includes 4 x servos, and 4 x wheels with tyres.

- Strong, colourful aluminium chassis
- Supplied with servos
- All screws and nuts included
- Compatible with Arduino, OrangePip, PICAXE, Genie and others
- **Does not require motor drivers**

Type	Order code	1+
2WD	**70-6415**	13.63
4WD	**70-6416**	14.78

560642

2WD & 4WD Motor Robot Platform Kits

This mini motor robot platform kit is available in 2wd or 4wd versions. The platform uses 2 or 4 DC motor gearboxes for drive, with speeds up to 100rpm and torque of 1.3kg/cm at 800mA. The robust red anodised aluminium chassis can stand up to knocks and tumbles and features additional mounting holes so that other hardware such as microcontrollers or sensors may be mounted.

The platforms are compatible with microcontrollers such as the Arduino, Orangepip, PICAXE, Genie, etc. The kit includes motors, chassis and fixings and wheels.

- Easy to assemble kit
- 60mm Diameter wheels with silicon tyres
- Wheels press-fit onto motor gearbox output shafts
- Power supply 4.5 to 6V DC
- Supplied with all fixings required

Type	Order code	1+
2WD Motor robot	**70-6417**	11.41
4WD Motor robot	**70-6418**	16.39

564035

Full range of robotics online

www.rapidonline.com/education

Magician Chassis

The Magician Chassis is a quick and easy way of using your preferred microcontroller system (such as PICAXE, GENIE, Arduino) in robotics applications. The self assembly kit comes complete with two high torque motors with built-in gearboxes, wheels, rollerball front wheel and 3xAA battery holder. The cleverly perforated chassis allows you to easily mount your PCBs using PCB pillars and screws.

- Overall dimensions 175 x 125 x 75mm
- Requires some simple assembly
- 65mm diameter wheels

Type	Order code	1+
Magician Chassis	**13-1192**	20.32

518246

RP-5 Robot Tank Track Chassis

The RP5 is a tank track style chassis, which is an ideal base for building mobile robots. The chassis has built-in motors and gearboxes which you can easily interface with PICAXE, GENIE, Arduino or any other microcontroller system, as well as radio control systems.

The RP5 tank track chassis is supplied ready assembled – just add your own control system and batteries!

- Dimensions: 175 x 135 x 60mm
- 2x 280 type motors
- 80:1 gear ratio
- Rubber tank tracks
- 6x AA Battery holder included

Type	Order code	1+
Tank Chassis	**13-1194**	36.12

518247

Accelerometers & Compass Sensors

HC-SR504 Ultrasonic Ranging Module

The HC-SR504 is a non-contact ultrasonic ranging module with a 20 to 4000mm range. The module includes ultrasonic transmitter, receiver, and control circuit - all on a compact circuit board.

- Easy to use
- Ranging accuracy up to 3mm
- Compact dimensions

Technical specification

Voltage	5V DC
Current	15mA
Frequency	40Hz
Range	20 to 4000mm
Measurement angle	15°
Trigger input signal	10µs TTL pulse
Echo output signal	Input TTL lever signal + range in proportion
Dimensions	45 x 20 x 15mm

Type	Order code	1+	10+	50+
HC-SR504	**74-1109**	2.80	2.54	2.37

565684

Sharp Infrared Distance Sensors

These infrared distance sensors are ideal for use in robotics projects because of their ease of use. The sensors give an analogue output which has a 2V variation between the maximum and minimum distances meaning they can be interfaced with just about any microcontroller.

Two versions are available and should be selected based on the distance that you wish to measure.

- Easy to use
- 5V supply required
- Analogue output
- 3-way JST connector - a suitable connecting cable with 30cm leads is available separately (**70-6412**)

Type	Order code	1+
4-30cm Optical sensor	**70-6407**	9.09
10-80cm Optical sens.	**70-6408**	9.77

554062

Triple-Axis Accelerometer Breakout Boards

The **Adafruit Triple-Axis Accelerometers** offer adjustable sensitivity and a choice of either I2C or SPI bus connectivity. Select from ±2, 4, 8 or 16g sensitivity; ±2g gives a higher resolution for slow movements while ±16g is best for high speed tracking. They can be configured to detect various events, such as a single tap or free-fall.

Supplied as a fully assembled and tested accelerometer boards plus a strip of 0.1in pitch header pins for you to solder on as required. Adafruit provide a free tutorials to help get you started, please refer to the individual product pages for details.

- 3-axis accelerometers with adjustable full scale
- Detect free-fall events etc.
- I2C or SPI connectivity
- Breadboard friendly

Type	Order code	1+
ADXL345	**73-5332**	17.13
LIS3DH	**73-5283**	4.85

563257

Line Follower Sensors

Optical Switch Phototransistor Output

These **reflective sensors** from **Vishay** contain an infrared emitter and phototransistor in a leaded plastic package designed to exclude visible light. The specification and feature set of these optical sensors makes them ideal for line tracking and following and also suitable for applications such as **position sensor** for shaft encoder, detection of reflective materials, limit switch for mechanical motion, etc.

- Available in standard and long lead versions
- Peak operating distance 2.5mm
- Operating range 0.2 to 15mm
- Typical output current 1mA
- Daylight blocking filter
- Emitter wavelength 950nm
- Dimensions 10.2 x 5.8 x 7mm
- Package includes 2x mounting clips

Type	Order code	1+
Optical switch	**60-8260**	0.894
Optcl swtch long legs	**60-8261**	0.58

559424

Gyro Sensors

L3GD20 Triple-Axis Gyro Breakout Board

The **Adafruit L3GD20 3-axis Gyro Breakout Board** has an adjustable full scale of ±250, ±500 or ±2000 degrees per second. It's simple to interface to a microcontroller with both I2C and SPI connectivity. Then add 3.3 to 5V logic and power compatibility and you have a very useful and versatile little board.

Supplied as a fully assembled and tested gyro board plus a strip of 0.1in header pins for you to solder on as required. Adafruit provide **a free library** as an example to help get you started.

- ±250 to ±2000 degree per second full scale (42 to 333rpm)
- On-chip temperature sensor
- 3.3 to 5V logic and power compatible
- I2C and SPI connectivity
- Dimensions 30.7 x 19.1 x 3mm (1.2 x 0.75 x 0.12in)
- Adafruit part no.: 1032

Type	Order code	1+
Gyro breakout board	**73-5397**	12.85

563269

GPS Modules

Grove - Physical Sensor Modules

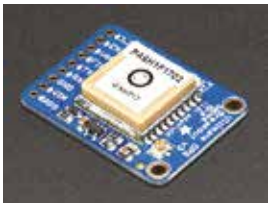
The **Physical Sensor modules from Seeed Studio** provides a range of specialist sensors to microcontrollers and computers such as the Arduino, Raspberry Pi etc.. The range includes gas and alcohol sensors, plus fingerprint, vibration, and touch sensors. There's even a module to measure galvanic skin response from any microcontroller with a spare analog port.

Type	Order code	1+
Fingerprint sensor	**75-0446**	37.78
Galvanic skin sensor	**75-0453**	7.54
Gas sensor CO	**75-0462**	5.63
Gas sensor LPG	**75-0467**	7.30
Magnetic switch	**75-0469**	2.18
Piezo sensor	**75-0449**	5.42
Sound sensor	**75-0448**	3.74
Sound sensor	**75-0460**	4.47
Touch sensor	**75-0452**	12.34
Temperature sensor	**75-0459**	8.90

560372

adafruit

Ultimate GPS Breakout Board MTK3339 Chipset 66 Channel Version 3



A **GPS** breakout board designed around the **MTK3339** chipset. This high quality GPS module can track up to 22 satellites on 66 channels and also features a built-in antenna and -165dB tracking, high sensitivity receiver. Location update rate is up to 10 per second and power usage is only 20mA during navigation.

The module has a built in data-logging capability that can log time, date, longitude, latitude, and height is logged every 15 seconds and only when there is a fix. The internal FLASH can store about 16 hours of data. When a bigger antenna is required, any 3V active GPS antenna can be connected via the uFL connector. The module will automatically detect the active antenna and switch over.

Includes one fully assembled and tested module, header for breadboarding, CR1220 coin cell holder (coin cell not included).

- Onboard ultra-low dropout 3.3V regulator
- 5V Friendly design and only 20mA current draw
- Breadboard friendly + two mounting holes
- ENABLE pin to turn off module using any microcontroller pin or switch
- Footprint for optional coin cell to keep RTC running and allow warm starts
- Fix status LED

Type	Order code	1+
GPS Breakout board	**75-0496**	41.09

559280

adafruit

Ultimate GPS HAT for Raspberry Pi A+, B+ or 2

The Ultimate GPS HAT has a built-in Real Time Clock (RTC) and a GPS module, adding precision time and location to a Raspberry Pi Model A+, B+, or Pi 2. The module has an internal patch antenna that works quite well when used outdoors. A u.FL connector enables connection to an external antenna. Additional features include status LEDs, PPS output on fix, and it is possible to obtain 7 years timekeeping by using a CR1220 backup battery (not supplied).

- Fully assembled GPS and PCB + 2 x 20 GPIO header
- Sensitivity -165 dBm
- 10Hz Updates
- 66 Channels
- Only 20mA current draw
- Break-outs for all the Raspberry Pi's extra pins
- Plenty of prototyping area for adding LEDs, sensors, etc.
- Requires a 12mm coin battery (e.g.CR1220)

Type	Order code	1+
GPS HAT	**75-0504**	46.22

559287

Sensor Robots

CIC
Line Tracking Mouse Kit

A sound-activated robot mouse that can follow a black line on a white background.

- A sharp sound, such as a handclap, sets the mouse tracking a line, using three photointerrupters as its eyes
- Self assembly kit includes:
- A programmed IC
- 2 sets of geared motors
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)

Requires 4x AA batteries (not included).

Type	Order code	1+
Line tracking mouse	**13-1035**	17.64

060686

CIC
Line Tracking Robot

The Line Tracking Robot will help keep you on the right track if you are interested in basic robotics. Follow the detailed instructions and you can assemble a robot that will follow the route you have designed for him. The Line Tracking Robot has 2 photo interruptors as eyes which can distinguish black from white using infrared rays. Create a route using black tape or a marker pen and the robot will follow it.

- Easy to assemble as no soldering is necessary
- All parts supplied (excluding tools)
- Suitable for Key Stages 3, 4 and 5
- Finished robot height 10.5 cm
- 2 x AA batteries required (not supplied)

Type	Order code	1+
Line Tracking Robot	**06-9348**	13.81

518244

CIC
Sound Reversing Car Kit

A small robot car that responds to sound.

- Using a microphone as a sound detector, the car reverses and turns when it 'hears' a sharp sound such as a handclap or the sound generated by hitting an obstacle

Requires 2x AA batteries (not included).

Type	Order code	1+
Sound reversing car	**13-1030**	8.55

060685

CIC
Follow-Me Robot

You can build your own faithful friend with the Follow Me Sound-Detecting Robot. This little chap responds to clapping sounds. With 4 built-in microphones, he detects the source of the sound and will turn and move towards it with a flash of his eyes and a beep. If he doesn't hear a signal for 2 minutes he will go into sleeping mode.

- Educational kit suitable for Key Stages 3, 4 and 5
- Kit includes all necessary parts (except tools)
- Full assembly instructions provided
- No soldering required
- Robot effective within 1 metre of sound source
- Finished robot heights 15cm
- Requires 4 x AAA batteries (not supplied)

Not suitable for children under 5 due to presence of small parts.

Type	Order code	1+
Follow-Me Robot	**06-9347**	25.36

518243

CIC
Escape Robot Kit

The Escape robot kit enables you to build a robot that never fails to find its way out of a maze. The Escape robot makes use of three infrared emitting diodes and one infrared receiving module to send and receive signals to detect obstacles. It contains an in-built microprocessor which enables it to think and process information about its environment.

- Soldering required
- Suitable for **Key Stages 2, 3 & 4** (ages 7 to 16)

Requires 4x AAA batteries (not included).

Type	Order code	1+
Escape robot	**13-1090**	14.47

070721

Rapid

Robot Duck

This pack contains all of the basic components for the creation of a two-legged robot duck. However, it does not include all of the instructions, allowing your pupils to conduct creative investigation.

- Suitable for **Key Stages 2 & 3** (ages 7 to 14)

Requires 1x AA battery (not included).

Type	Order code	1+
Two legged robot duck	**13-0884**	4.98

010548

TEP

Jitterbugs

Create a fantastic motorised jitterbug, which jumps and moves, by utilising a spinning off-centre mass (see **06-0698**, for off-centre mass wheels).

- The bug's battery and motor are hung underneath, so that a graphic image can be glued to the top plate
- This great value product, comes complete with all components, instructions, plus a choice of 3 graphic images
- Suitable for **Key Stages 2 & 3** (ages 7 to 14)

Requires 1x AA battery (not included).

Type	Order code	1+
Jitterbug	**13-0790**	1.84

066880

STEAM resources

Visit our STEAM lab for project ideas

www.rapidonline.com/steam-lab

Wooden Robotic Kits

CIC

Automech Kit

A motorised racing car kit based around pre-punched wooden parts and a modular gearbox kit.

- No soldering required
- Pulley operation
- Tools required: modelling knife, screwdriver and long nose pliers
- Supplied complete with, switch, battery holder and all parts needed
- Suitable for **Key Stage 2+** (ages 7 and above)

Requires 2x AA cells (not included).

Type	Order code	1+	5+	10+	20+
Automech	**13-0998**	10.47	9.68	8.99	8.17

066808

Servos

FEETECH

SCS15 Smart Control Digital Servo with Metal Gears and Brackets

The **SCServo** is a multipurpose UART BUS **robot** servo designed for use with Arduino. The unit can work in both servo mode and wheel mode. The servo mode can be wired together in robots to control limbs and set them at specific angles. The wheel mode is intended for wheel-type operations. The SCServo can give feedback on the values of position, temperature, load, speed and input voltage, as well as having the ability to set parameters such as speed of rotation, max. output torque, operating voltage limit, operating temperature limit, etc.

To connect to Arduino The TTLinker control board is required (available separately as **37-1333**). The TTLinker is a signal conversion board. Arduino needs to convert its UART signals to the half duplex type and through TTLinker connect to SCServo. The TTLinker also has more interfaces to make provision for more sensors.

- Supplied with metal gears and brackets
- A 70mm wheel with tyre is also available (**37-1334**)
- SCServo is easily controlled by Arduino
- The SCServo has a unique ID number to identify on BUS network
- Operating voltage range 6 to 8.4V
- 73 rpm Max. operating speed at 8.4V

Type	Order code	1+	5+	10+
SCS15 Servo	**37-1332**	25.75	23.76	22.99
TTLinker board	**37-1333**	3.43		
70mm Wheel and tyre	**37-1334**	0.54		
3-Pin servo cable	**37-1337**	0.613		

559635

FEETECH

FS90R Analog Micro Servo Continuous Rotation

The **FS90R** is an analog micro servo that is capable of continuous rotation clockwise or anti-clockwise, as opposed to moving to a set position. The servo is ideal for the beginning roboticist and is perfect for use with the Motor Shield for **Arduino**. The servo can be controlled using any servo code, hardware or library and to control with an Arduino, just connect the orange control wire to pin 9 or 10 and use the Servo library included with the Arduino IDE.

Also available is a wheel (**37-1338**) that can be attached directly to the servo. The servo and wheel are also available as a package (**37-1336**).

- Good for making simple moving robots
- Small dimensions means servo can fit in confined spaces
- Lightweight
- Operating voltage 4.8 to 6V
- A 3-pin 10cm cable is available for connecting servos

Type	Order code	1+
FS90R 360° Servo	**37-1335**	5.36
Servo and wheel	**37-1336**	3.46
Wheel for servo	**37-1338**	1.65

559636

FEETECH

FS90 Mini Servo 120° Operating Speed 0.12sec/60°

The **FS90** is an analog micro servo that has 120° of rotation. The servo is ideal for the beginning roboticist and is perfect for use with the Motor Shield for **Arduino**. The servo can be controlled using any servo code, hardware or library and to control with an Arduino, just connect the orange control wire to pin 9 or 10 and use the Servo library included with the Arduino IDE.

- Good for making simple moving robots
- Small dimensions means servo can fit in confined spaces
- Lightweight
- Operating voltage 4.8 to 6V
- A 3-pin 10cm cable is available for connecting servos (**37-1337**)

Type	Order code	1+	25+
FS90 Servo	**37-1339**	3.48	3.13

560555

Rapid

Tower Pro SG90 Mini Servo

The Tower Pro SG90 Mini Servo is a low-cost, well specified servo ideal for use in radio-controlled models and for interfacing with microcontroller systems like Arduino, Raspberry Pi, PICAXE, etc.

- Size: 23 x 12.2 x 29mm
- Low-cost, high quality
- Supplied complete with control horns and mounting screws
- **Tower Pro type SG90**

Type	Order code	1+	25+	50+
Mini servo	**37-1330**	3.85	3.41	3.08

530144

MODELCRAFT

BMS-410C Plastic Gear JR Standard Servo Analogue Servo

The Modelcraft BMS-410C Standard Servo is not only economical, but ideal for many applications in **Radio Control** modelling owing to its **standard dimensions**. It is also compatible with microcontroller systems such as PICAXE, Arduino and Raspberry Pi.

- Standard dimensions
- Includes control horn and screw
- **Modelcraft type BMS-410C**

Type	Order code	1+
Plastic gear servo	**49-9395**	6.76

534062

MODELCRAFT

Servo Tape 230 x 65 x 2mm

Double-sided adhesive foam tape to attach servos, receivers, gyro systems and other radio control components.

- Good adhesion
- Size 230 x 65 x 2mm
- Supplied in packs of 2

Type	Order code	1+
Servo Tape	**51-2318**	2.63

524229

MODELCRAFT

Micro Servo MC1811

Affordable micro servo from Modelcraft, suitable for use as a replacement servo for ARF models or as part of the standard equipment for the hobby workshop.

- Mounting material included

Type	Order code	1+
Micro Servo	**51-2338**	7.07

524249

Motors & Gearboxes

seeed studio

Mini Vibration Motor 3V 2.0mm Circular

The **Mini Vibration Motor from Seeed Studio** operates from 3V DC and vibrates constantly when energised. The motor is not sensitive to the polarity of the voltage applied.

- ø 10 x 2mm

Type	Order code	1+
Vibration motor	**75-0416**	0.957

560351

Mini Vibration Motor 3V Rectangular

The **Mini Vibration Motor from Seeed Studio** operates from 3V DC and vibrates constantly when energised. The motor is not sensitive to the polarity of the voltage applied.

- Operating Voltage: 2.2 to 3.6V DC
- Rated Voltage: 3.0V DC
- Rated Speed: 12,000 90mA max
- Stall Current: 120mA max
- Starting Voltage: 2.0V DC max
- Mechanical Noise: 50db(A) max
- Weight: 2g approx.
- Dimension: 12 x 4.6 x 4.6mm

Type	Order code	1+
Vibration motor	**75-0417**	2.19

560352

3V, 13100 RPM DC Motor

A low-cost miniature DC motor with many applications including models, robotics and educational demonstration equipment.

- Operating voltage 1.5 to 4.5V DC
- Two flat sides make the motor ideal for mounting on a PCB
- Rotates counter-clockwise when viewed from shaft end
- Solder tag termination

Technical specification

Rated voltage	3V DC
No load current	0.34A max.
No load speed	16,400rpm ± 15%
Rated load	8.0 g.cm
Rated load current	1.07A max.
Rated load speed	13,100rpm ± 12%
Length excluding shaft	25mm
Diameter	20mm
Width across flats	15.1mm
Shaft length	9.4mm
Shaft diameter	2mm
Weight	17g approx.

MOQ 2

Type	Order code	2+	25+	100+
3V, 13,100 rpm	**37-0140**	0.757	0.573	0.43

061539

Miniature Motor 3V 5240rpm

A low-cost miniature motor offering a higher stall torque.

- Ideal for models, robotics, etc.
- Operating voltage 1.5 to 4.5V DC
- Rotates clockwise when viewed from shaft end
- Solder tag termination

Technical specification

Rated voltage	3V DC
No load current	0.13A max.
No load speed	6700rpm ±15%
Rated load	10.0 g.cm
Rated load current	0.45A max.
Rated load speed	5240rpm ±12%
Length excluding shaft	26.9mm
Diameter	23.8mm
Shaft length	8.6mm
Shaft diameter	2mm
Weight	28g approx.

Type	Order code	1+	25+	100+
3V, 5240 rpm motor	**37-0142**	1.11	0.783	0.718

061541

Miniature Motor 3V 8000rpm

A high torque miniature DC motor for higher power requirements.

- Operating voltage 1.5 to 6.0V DC
- Rotates clockwise when viewed from shaft end
- Solder tag termination

Technical specification

Rated voltage	3V DC
No load current	0.23A max.
No load speed	9000rpm ±15%
Rated load	10.0 g.cm
Rated load current	0.63A max.
Rated load speed	8000rpm ±12%
Length excluding shaft	30.5mm
Diameter	24.2mm
Shaft length	12mm
Shaft diameter	2mm
Weight	42g approx.

Type	Order code	1+	25+	100+
3V, 8000 rpm motor	**37-0144**	1.09	0.834	0.712

061542

EMG30 Motor with Gearbox and Integrated Encoder

The EMG30 is a 12V motor and 30:1 reduction gearbox in a single unit giving a 1.5 to 200rpm output speed. It also has a built-in hall-effect motor encoder which gives precise control.

- Terminated with a 6-way JST connector for easy connection
- Mounting bracket available separately (**70-6406**)
- Can be controlled via I2C using the MD25 driver

Technical specification

Rated voltage	12V
Rated torque	1.5kg/cm
Rated speed	170rpm
Rated current	530mA
No load speed	516
No load current	150mA
Stall current	2.5A
Rated output	4.22W
Encoder counts per o/p shaft turn	360

Type	Order code	1+
EMG30 Motor	**70-6404**	26.94

554056

Solar Motor Worm Drive Gear Box

A worm drive gearbox in an aluminium housing powered by a solar motor.

- Shaft length 125mm approx.

Type	Order code	1+
Worm drive gearbox	**06-1592**	5.63

553715

Self Adhesive Motor Mount

A push fit motor mount to suit our range of miniature motors.

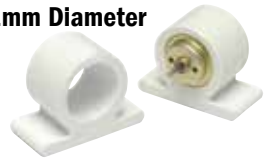
- Base has self adhesive surface for easy mounting of the motor as required
- Colour may vary
- Supplied in **packs of 10**

Type	Order code	1+
Motor mount	**37-0360**	2.17

064468

Motor Clip 21mm Diameter

Suitable for holding a motor to a flat surface.



- Ideal for use with motors with a diameter of 21mm

MOQ 3

Type	Order code	3+
21mm Motor clip	**06-6054**	0.29

079036

Motor Clip

Suitable for holding a motor.

- Heat in hot water to soften for easier fitting
- Ideal for use with motors with a diameter of 21 and 23.8mm
- Paper packaging may be required with 21mm motors

MOQ 10

Type	Order code	10+
21/23.8mm dia. Motors	**06-6052**	0.099

078968

EMG30 Aluminium Mounting Bracket

Aluminium mounting bracket designed for the EMG30 motor.

- Robust construction
- 74 x 25 x 45mm

Type	Order code	1+
Mounting bracket	**70-6406**	2.99

554077

100mm Diameter Robot Wheel

This 100mm diameter wheel is fitted with a 5mm hub and retaining grub screw, which means it can be easily fitted to a motor that has a 5mm shaft with a flat.

- Ideal for use with the EMG30 motor
- Rubber tyre
- 5mm Hub with retaining grub screw
- Supplied **singly**

Type	Order code	1+
100mm Robot wheel	**70-6411**	8.81

554059

MDS25 Dual H-Bridge Driver

Designed to work with the EMG30 motors, the MDS25 can drive two motors and is controlled by serial or I2C making it compatible with most microcontroller platforms.

The board has two modes of operation which allow direct individual control of each motor or the ability to send a speed and turn command when using two motors. An onboard 5V regulator allows you to use the 12V batteries that will power your robot to also power your microcontroller or other electronics.

- 2x 6-way JST connectors for easy interface with EMG30 motors
- Can be controlled via serial or I2C connection
- Compatible with a wide range of microcontrollers including Arduino and PICAXE
- Returns 360 counts per revolution when used with the EMG30
- Up to 2.8A per motor
- On-board 5V 300mA regulator for powering your microcontroller

Type	Order code	1+
Dual H-bridge driver	**70-6405**	34.54

554057

MFA / COMO DRILLS

Geared Motor Accessory Kit

A kit containing a useful selection of mechanical parts, ideal for the construction of motorised models, robots, buggies, technology projects, etc.

- Motorised gearbox
- Wheels
- Hardware
- Gears
- Rack and pinion
- Perforated metal sheet and strips
- Axles/shafts
- Nuts
- Bolts and washers
- Chain and sprockets
- Worm drive
- Toggle switch
- Size D 1.5V zinc-chloride battery and battery box

Type	Order code	1+	5+
Geared motor kit	**37-1100**	23.30	22.66

064471

Rapid

Submarine Motor

A submarine motor encased in a plastic housing with a rubber sucker for attachment.

- Motor pulls apart to insert battery
- Twisting the battery starts the motor
- Dimensions 120mm(L) approx.

Requires 1x AA battery (not included).

Type	Order code	1+
Submarine motor	**06-6050**	1.84

078967

Rapid

Economy Gearbox and Motor

An economy gearbox with clear casing.

- Complete with 3V motor
- Helps pupils to understand the mechanics and movement of gears and motors
- Reduction ratio 40:1
- Output shaft diameter 4mm

Type	Order code	1+
Economy gearbox	**37-0165**	3.77

010556

Kitting Service

Don't forget we offer a bespoke kitting service

education@rapidonline.com

CIC

2-in-1 Gearbox

A gearbox kit which contains:

- Electric motor (3-6V)
- 2 sets of gears giving either a 60:1 or 288:1 reduction (approx. 200 or 42rpm)
- Gearbox chassis and shafts

Type	Order code	1+
2-in-1 Gearbox	**13-1020**	3.98

064472

Rapid

Buggy Accessory Kit

A great chance for you to buy a bumper pack of model accessories, whilst also making a super saving.

- 2x caterpiller tracks
- 100x card axle supports
- 100x gears in assorted sizes and colours
- 100x wheels in assorted colours
- 20x 3V motors
- 20x S/A motor mounts
- Supplied in an educational storage tray with lid
- **Supplied as a pack**

Type	Order code	1+
Model accessory kit	**13-0162**	40.13

070728

AmpFlow

E30-150 77mm (3in) 24V Motors and Gearboxes

Ampflow E30-150 motors are designed to give the best possible performance at the lowest possible price.

Using ferrite magnets and with a nominal voltage of 24V, these motors have a peak power of 1.0hp making them ideal for heavy-duty robotics, motorised vehicles and automation applications.

A 9-tooth sprocket and key suitable for the motor shaft is available separately, please see order code **37-0289**.

The motors are available with or without an 8.3:1 reduction chain-drive gearbox.

- Motor diameter: 79mm
- Motor length: 102mm
- Peak power: 0.75kW (1.0hp)
- Motor RPM 5600

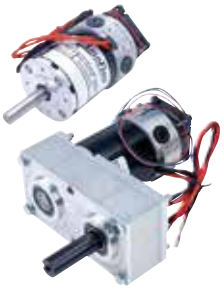
Type	Order code	1+
Motor	**37-0311**	75.98

565848

AmpFlow

A28-150-F 77mm (3in) Diameter High Performance Motors and Gearboxes

The Ampflow A28-150-F series are designed to give the highest possible performance from brushed DC motors.



Using rare-earth neodymium magnets and with a nominal voltage of 24 (or 48V), these motors have a peak power of 3.0hp (4.6hp for 48V model) making them ideal for high performance, heavy-duty robotics, motorised vehicles and automation applications. They are fitted with a fan and are drilled with vent holes to allow flow-through cooling which allows longer duty cycles and even higher power outputs.

A 9-tooth sprocket and key suitable for the motor shaft is available separately, please see order code **37-0289**.

The motors are available in 24V and 48V ratings with or without **an 8.3:1 reduction chain-drive gearbox.**

Replacement brushes, order code 37-0285, are available separately.

Type		Order code	1+
Motor	24V	**37-0313**	342.89
Motor and gearbox	48V	**37-0318**	299.00

565850

AmpFlow

Sprocket and Key for E30 and A28 Motors

These sprockets have a 12.7mm (½in) bore to fit Ampflow E30 and A28 motors and are supplied with a suitable key.

The sprockets have 9 teeth and work with #35 roller chain.

Type	Order code	1+
Sprocket and key	**37-0289**	14.69

565229

AmpFlow

E30-400 79mm Diameter (3in) 24V Motors and Gearboxes

Ampflow E30-400 motors are designed to give the best possible performance at the lowest possible price.

Using ferrite magnets and with a nominal voltage of 24V, these motors have a peak power of 2.1hp making them ideal for heavy-duty robotics, motorised vehicles and automation applications.

A 9-tooth sprocket and key suitable for the motor shaft is available separately, please see order code **37-0289**.

The motors are available with or without an 8.3:1 reduction chain-drive gearbox.

- Motor diameter: 79mm
- Motor length: 147mm
- Peak power: 1.58kW (2.1hp)
- Motor RPM 5700

Type	Order code	1+
Motor	**37-0281**	114.00
Motor with gearbox	**37-0288**	280.84

565226

Replacement Brushes and Brush Caps for Ampflow Motors

Replacement brush sets and brush caps for Ampflow A40-300 and A28-400 motors.

- Replacement caps fit both A40-300 and A28-400 motors

Type	Order code	1+
Brushes for A28-400	**37-0285**	41.29
Brushes for A40-300	**37-0287**	25.80
Brush caps (4)	**37-0293**	9.00

565786

High-Traction Drive Wheels with Keyed Hubs

These wheels are from the Colson Performa range, which has long been a favourite of combat robot builders.

The non-marking thermoplastic elastomer tread is permanently bonded to a ribbed polyolefin wheel core which is fitted with a 19.05mm (¾in) aluminium hub with a 6.35mm (¼in) key-way. Each wheel comes with a 6.35mm (¼in) key and two steel discs for holding the wheel in place on the end of a 19.05mm (¾in) shaft.

- Wheel diameter 152mm (6in)
- Shaft diameter 19.05mm (¾in)
- Ideal for direct fitting to AmpFlow gear-motors **37-0283**, **37-0288** & **37-0291**

Type	Order code	1+
150mm keyed wheel	**37-0389**	30.39
200mm keyed wheel	**37-0290**	39.27
250mm keyed wheel	**37-0292**	24.36

565692

Motor Accessories

TB6612 1.2A DC/Stepper/Solenoid Motor Driver Breakout Board

The **Adafruit Solenoid/ Stepper Motor Driver Breakout Board** is a versatile high current driver able to control 2 x bidirectional DC motors, 1 x stepper motor or 2 x solenoids. It uses a TB6612 dual H-bridge chip that can supply 1.2A, which isn't that high in real terms but it's a huge current compared to the recommended 20mA output from an Arduino GPIO pin for example. The chip has built-in flyback diodes to prevent damage due to inductive kick-back and Adafruit have added reverse polarity protection on the motor power input as well. The H-bridges are disabled at power-up to prevent twitching when power is applied. All the logic inputs are 3.3 to 5V compatible so you can run the driver board from an Arduino or Raspberry Pi, while the motor power has a separate input from 4.5 to 13.5V DC. There's a separate PWM input on each H-bridge so that you can control the motor speed.

Supplied as an fully assembled and tested board plus a strip of 0.1in header pins for you to solder on as required. Adafruit supply a free tutorial to get you started. An ideal board for those times when you just want to get something working quickly.

- Dual H-bridge breakout board
- Flyback diodes and reverse motor power protected
- Motors disabled on power up
- 2 x bidirectional DC motors, 1 x stepper motor, 2 x solenoids
- Up to 1.2A drive current per motor
- 3.3 to 5V logic and power compatible
- Separate motor power from 4.5 to 13.5V DC
- Adafruit part no.: 2448

Type	Order code	1+
Breakout board	**73-5310**	5.09

563235

2305 Haptic Motor Controller (DRV2605L)

The **Adafruit DRV2605L Haptic Motor Controller** adds effects to haptic motor control giving you freedom to choose more interesting or informative vibrations. The DRV2605L chip has a library of 123 effects such as click, double click, ramp, and hum, including various intensities; it's a very smart chip. To make your project easier, Adafruit supply a tutorial and code library for Arduino. This should be simple to convert to any microcontroller. The board uses I2C so connecting to it is quick and simple and with Adafruit's library you should be up and running in no time. It is specified to work with Linear Resonance Actuator (LRA) and Eccentric Rotating Mass (ERM) type motors, though Adafruit have only tested it with ERM motors.

Supplied as a fully assembled board plus 1 x 5-pin header for you to solder on if your project needs it.

Haptic or vibration motors are available separately.

- Make haptic feedback motors more interesting and informative
- Have different effects for different conditions rather than a single buzz
- Works with 3 to 5V power and logic

Type	Order code	1+
Haptic motor driver	**75-0568**	7.78

561285

815 Servo/PWM Driver 16 Channel 12-bit

The **Adafruit PCA9635 PWM/servo driver breakout board** will drive 16-channels with 12-bit PWM (Pulse Width Modulation) at up to 1.6kHz. This versatile board can drive servos or LEDs or anything else that needs PWM with output voltages up to 6V. Uses a miserly 2 x I2C pins on the microcontroller, and the I2C address selection means you can have up to 62 of these boards for a total of 992 channels! Adafruit supplies a software library you can download and a tutorial to get you started.

Supplied as a fully assembled board plus 4 sets of 3 x 4 male straight headers, a 2-pin terminal block, and 1 x 6 0.1in header pins for breadboarding. The microcontroller, servos and LEDs are available separately.

Available either as a breakout board or as an Arduino shield.

- Drive 16 x servos or 16 x LEDs with 12-bit PWM up to 1.6kHz
- 5V compliant, compatible with 3.3V Arduino
- Drive outputs up to 6V, ie LEDs with 3.4V Vf
- I2C driver with built-in clock reduces microcontroller overhead
- Terminal block for power with reverse polarity protection

Type	Order code	1+
Servo/PWM driver	**75-0565**	14.64

561282

Stepper Motor Control/Driver

The L293D is a monolithic integrated, high voltage, high current, 4-channel driver.

- L293E is a quad push-pull driver capable of delivering output currents up to 1A per channel
- L297 generates four phase drive signals for two phase bipolar and four phase unipolar stepper motors in microcomputer controlled applications

Technical specification

Device	Function	Package	Order code
L293D	Accepts DTL/TTL logic levels, will drive inductive loads, DC and stepper motors, switching power transistors.	DIL-16	**82-0192**
L293E	TTL compatible control, inhibit input on each pair of drivers, external connections for sensing resistors.	DIL-20	**82-0194**
L297	Motor can be driven in half-step, normal and wave drive modes, on-chip PWM chopper circuits permit switch-mode control of the current in the windings. Requires only clock, direction and mode input signals.	DIL-20	**82-0198**

Type	Order code	1+	10+	25+	100+
L293D	**82-0192**	3.58	2.52	2.19	1.68
L293E	**82-0194**	2.88	2.20	2.06	
L297	**82-0198**	6.91	5.75	5.49	

034479

Plastic Pulleys

A range of plastic pulleys ideal for use with our range of miniature motors.

- Rigid black plastic with deep V-grooves
- All sizes include motor spindle stand-offs
- Excellent for robots, mechanical constructions, science experiments as well as functional tasks
- 10mm pulley will interference fit on to a 2mm shaft
- Other pulleys will interference fit on to a 3.2mm shaft

Technical specification

Order code	Diameter	Width
37-0342	10mm	10.7mm
37-0344	20mm	5.8mm
37-0346	30mm	5.9mm
37-0348	40mm	5.9mm

MOQ 10 - In Multiples of 10

Type	Order code	10+
10mm dia.	**37-0342**	0.176
MOQ 5		
	Order code	5+
20mm dia.	**37-0344**	0.17
30mm dia.	**37-0346**	0.17
MOQ 4		
	Order code	4+
40mm dia.	**37-0348**	0.25

071522