What are the curriculum highlights?

The process of children actively building, exploring, investigating, enquiring and communicating together benefits their development in innumerable ways over and above the more traditional learning parameters. See the curriculum grid for more details. Here is an overview:

Design and technology
Making solutions to match real needs; choosing appropriate materials and processes; designing, making, testing and modifying; exploring systems and subsystems, and safety and control systems; using 2-dimensional instructions; creating 3-dimensional models; working cooperatively in a team, and more.

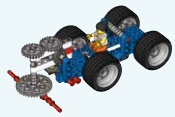
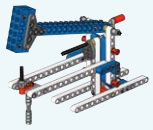
Science
Investigating, collecting, storing and transferring energy; force, speed, and the effect of friction; simple machines, calibrating and reading scales, scientific fair testing, purposeful enquiry, predicting and measuring, collating data, drawing conclusions, and more.

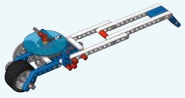
Mathematics
Maths in the service of science and technology; measuring distance, time, speed (velocity), and weight (mass); notions of accuracy in calibrating and reading scales; tabulating and interpreting data; informally calculating ratios, and more.

Curriculum grid
Grab a pencil and note pad and sit just for a few minutes watching and listening as a pair of your 'Buddy Builders' collaborate on any of the LEGO® activities. Note down key knowledge, skills and attitudinal outcomes as they become apparent to you.

We are sure the many valuable academic, creative, problem-solving and social aspects of the activities will speak for themselves.

The major skill and knowledge outcomes most schools require for lesson planning are listed in the Curriculum grid on the following pages.

	Sweeper	Fishing Rod	Freewheeling	The Hammer
				
FORCES & MOTION				
Design and technology curriculum: Identifying a need and developing ideas. Working as individuals and in teams. Use materials and components as well as modular construction kits to design and make high-quality working prototypes. Use appropriate testing to identify improvements. Assembling and disassembling a range of familiar products and testing how well they meet the intended purpose.	• Investigating pulley drives for safety and gears for speed • Controlling friction and slip • Designing and making: the most efficient push along cleaning machine	• Investigating the ratchet and pawl as a safety system • Investigating automatic mechanical control of motion • Designing and making: a fishing game with easy-to-understand rules and a fair scoring system	• Investigating the effects of different wheel sizes and tyre material on vehicle efficiency (working characteristics of materials) • Wheels and axles to move loads • Designing and making: a downhill runner vehicle that rolls as far as possible	• Investigating mechanical control and timing of complex actions by cams and levers • Investigating how industries test quality of components • Designing and making: a mechanical toy with as many actions as possible
Science curriculum: Scientific enquiry including predicting and measuring the effect of variables on the performance of simple machines. Careful observation, measurement and recording.	• Balanced and unbalanced forces • Friction	• Reducing speed and increasing force using string and pulleys (block and tackle)	• Inclined planes • Friction	• Inclined planes • Friction
Mathematics' curriculum: Using and applying mathematical ideas. Calculations using all number operations. Calculate and use notions of area, averages and ratios. Measure time, distance and (force) weight to a suitable degree of accuracy. Use word equations; solve simple equations to calculate speed. Identify patterns in results; collect and handle data in tables. Communicate mathematical ideas in speech, and in written and graphic forms.	• Measuring distance • Ratios • Notions of efficiency as a percent or fraction	• Measuring distance • Estimating and comparing force, speed • Designing and evaluating fair scoring systems and fair rules for games • Ratios and fractions	• Reading and calibrating scales • Measuring distance, mass • Working with negative numbers (at bottom of hill, rolling the car backwards to zero) • Exploring limits to accuracy • Calculating averages	• Measuring number of 'impacts' per unit time • Estimating and comparing LEGO® element grip forces • Expressing relative grip forces using mathematical terms

	Trundle Wheel	Letter Balance	Click-Clock	
				
MEASUREMENTS				
Design and technology curriculum: Identifying a need and developing ideas. Working as individuals and in teams. Use materials and components as well as modular construction kits to design and make high-quality working prototypes. Use appropriate testing to identify improvements. Assembling and disassembling a range of familiar products and testing how well they meet the intended purpose.	• Investigating gearing down and complex gearing • Designing scales that are accurate and easily readable by the user • Designing and making: the most accurate and easy-to-use distance measuring device	• Investigating lever and linkage systems • Designing scales that are accurate and easily readable • Designing and making: the most accurate and easy-to-use weighing machine	• Investigating feedback control systems (pendulum and escapement) and gearing up • Designing scales that are accurate and easily readable • Designing and making: the longest running and most accurate time measuring device	
Science curriculum: Scientific enquiry including predicting and measuring the effect of variables on the performance of simple machines. Careful observation, measurement and recording.	• Calibrating and reading scales • Measuring distance to limits of accuracy	• Balancing forces • Calibrating and reading scales • Measuring weight to limits of accuracy	• The pendulum • Calibrating and reading scales • Measuring weight to limits of accuracy	
Mathematics' curriculum: Using and applying mathematical ideas. Calculations using all number operations. Calculate and use notions of area, averages and ratios. Measure time, distance and (force) weight to a suitable degree of accuracy. Use word equations; solve simple equations to calculate speed. Identify patterns in results; collect and handle data in tables. Communicate mathematical ideas in speech, and in written and graphic forms.	• Reading and calibrating scales • Measuring distance • Counting up, counting down • Comparing accuracy of different measuring methods • Ratios and fractions • Expressing the degree of error	• Reading and calibrating scales • Measuring mass • Comparing accuracy of different measuring methods • Working with negative numbers • Expressing the degree of error	• Measuring time • Reading and calibrating scales • Comparing accuracy of different measuring methods • Expressing the degree of error	

	Windmill 	Land Yacht 	Flywheeler 	
ENERGY				
Design and technology curriculum: Identifying a need and developing ideas. Working as individuals and in teams. Use materials and components as well as modular construction kits to design and make high-quality working prototypes. Use appropriate testing to identify improvements. Assembling and disassembling a range of familiar products and testing how well they meet the intended purpose.	• Investigating sail material, shape, and area for effectiveness in capturing wind energy • Investigating structures • Designing and making: the most effective energy storage and release system for a windmill	• Investigating sail shape, area and angle to wind for effectiveness in capturing wind energy • Investigating mechanisms for efficient energy for use in transport • Designing and making: the most efficient omni-directional wind powered vehicle	• Investigating the flywheel as a speed control (gearing up) and safety mechanism • Investigating the flywheel as an energy store • Using gears to increase speed • Designing and making: the smoothest running vehicle that rolls furthest using its onboard energy store	
Science curriculum: Scientific enquiry including predicting and measuring the effect of variables on the performance of simple machines. Careful observation, measurement and recording.	• Capturing wind energy to run machines • Storing and transferring energy; kinetic to potential energy transformations • Balanced and unbalanced forces	• Capturing wind energy for transport • Transforming energy by gearing down • Forces and wind resistance • Balanced and unbalanced forces	• Storing kinetic/ moving energy • Friction • Balanced and unbalanced forces	
Mathematics' curriculum: Using and applying mathematical ideas. Calculations using all number operations. Calculate and use notions of area, averages and ratios. Measure time, distance and (force) weight to a suitable degree of accuracy. Use word equations; solve simple equations to calculate speed. Identify patterns in results; collect and handle data in tables. Communicate mathematical ideas in speech, and in written and graphic forms.	• Measuring force in time and area • Estimating and comparing speed and efficiency related to sail shape and area	• Estimating and measuring distance, area, time and angle • Expressing speed and efficiency, related to the angle to wind. • Expressing speed and efficiency, related to the shape and area of the sail	• Measuring distance and time • Expressing speed and distance travelled related to the mass of the flywheels	

	Power Car	Dragster	The Walker	Dogbot
				
POWERED MACHINES				
Design and technology curriculum: Identifying a need and developing ideas. Working as individuals and in teams. Use materials and components as well as modular construction kits to design and make high-quality working prototypes. Use appropriate testing to identify improvements. Assembling and disassembling a range of familiar products and testing how well they meet the intended purpose.	• Investigating gearing down, different tyre types and wheel types to give more torque • Investigating the speed and pulling power of different arrangements of gears and wheels • Designing and making: a powered vehicle that can pull the heaviest possible load	• Investigating gearing up • Designing and making: a dragster that will travel the furthest when released from a launcher	• Investigating cranks, levers, and linkages on stability and stride distance to produce walking or reciprocating movements • Investigating ratchets to control slippage and create one-way movement • Investigating relative positions of cranks to produce a variety of life-like 'gaits' • Investigating the worm gear for extreme gearing down • Designing and making: a walker that can tackle the steepest hills and most difficult terrain	• Investigating levers, linkages, cams and cranks to produce complex timed and controlled movements • Investigating pulleys and slip for safety • Using a variety of materials to create a 'skin' for a dynamic model • Designing and making: an 'animatronic' creature that simulates dog-like behaviour
Science curriculum: Scientific enquiry including predicting and measuring the effect of variables on the performance of simple machines. Careful observation, measurement and recording.	• Investigating the effects of load on friction; reducing friction • Inclined planes and work	• Investigating the transfer of movement and energy • Investigating relationship between speed and mass; momentum and kinetic energy	• Careful observation of the way a person moves in order to compare with the way a walker actually moves	• Careful observation of the way a dog moves to compare with Dogbot's movements
Mathematics' curriculum: Using and applying mathematical ideas. Calculations using all number operations. Calculate and use notions of area, averages and ratios. Measure time, distance and (force) weight to a suitable degree of accuracy. Use word equations; solve simple equations to calculate speed. Identify patterns in results; collect and handle data in tables. Communicate mathematical ideas in speech, and in written and graphic forms.	• Measuring distance and time of travel • Measuring and expressing angle of slope • Notions and calculations of wheel diameter and circumference related to distance travelled per rotation	• Measuring distance and time of travel • Noticing patterns of distance travelled related to wheel mass	• Measuring distance, time • Calculating speed • Noticing pattern of stride length related to crank length • Measuring and expressing angle of slope	• Measuring and expressing the degree and direction of movement of 'body parts', and number of actions per unit of time • Noticing patterns of eye movements related to fulcrum position in cams • Evaluating and expressing model performance (behaviour), qualitatively and quantitatively