

MASTEREIGN

ENRICHMENT GROUP

From Success To Significance



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From Success To Significance



VISION & MISSION

To be Asia Pacific's best and most admired holistic enrichment group.

To thrive as a leading holistic tribe with a heart to serve and a passion to make positive impact in Singapore and the region. The journey is from success to significance.

OUR CULTURE

As a united tribe, we have a continuous growing organizational structure that does not stifle but instead encourage each individual to be innovative and enterprising. That means we have the courage to take creative risks, embrace change and push the envelope to profit others.

We believe in creating value for our customers, bringing benefits to our associates and being the source of tremendous blessing at large.

Our leaders know where they are going and we follow and commit ourselves to the vision. We let tribal customs thrive by mutually respecting and recognizing one another's contributions and talents.

The journey ahead is not without obstacles but in the midst of it all, we remember to celebrate life and cheer everyone to finish strong in the race.

OUR CUSTOMERS

Since 1997, we have served more than a quarter of a million youths and adults in over 300 government schools and educational institutions. Many are customers who have stayed with us for years and on that note, we are grateful and humbled.

Our tribal values which are spelt out in the 4Rs have effectively served as practical guideposts for us to grow and thrive.

RESPONSIBILITY - We can be trusted to do what we have promised. We do what is right with integrity and sincerity.

RELATIONSHIP - We care for the quality of life of each person. We inspire compassion, optimism and fun wherever we are.

RESULTS - We encourage ownership and work practices that lead to a strong finish. We plan wisely, monitor closely and overcome problems through creative solutions. We want only excellent and remarkable outcomes.

REWARDS - We practise sound stewardship principles. We are a generous tribe and we reward the best in the land. We are transparent and fair in our dealings and these are what make this tribe attractive and authentic.



OUR PROGRAMME CONSULTANTS



Theresa Huang

Theresa Huang has been in the education industry since 2005. She has had extensive experience working with children, both in the outdoor and indoor settings. Theresa graduated from the National Institute of Education and has been teaching in a local primary school since 2006, specializing in English, Mathematics and Science. She has had experience working with her younger peers since she was in her teens when she monitored and assisted them. Theresa has conducted and facilitated educational school camps for both primary and secondary students. During her days at Nanyang Technological University and the National Institute of Education, she was involved in management committees that conducted nationwide events for youths and adults. This well-equipped her with the necessary skills for the management of the Centre. Theresa believes that “one never stops learning”. She is currently studying Psychology to better understand children and their needs.

OUR PROGRAMME CONSULTANTS



Shirley Ang

Active, enthusiastic and motivated, that's Shirley! With a passion for bringing joy to children, she embarked on her journey as an educator in year 2005 by attaining a Diploma in Early Childhood Education. She started out as a Program Executive cum Trainer, planning extensive curriculum for kids. She also taught Gym, Music and English to the little ones for over 2 years. Shirley has also trained staff and managed a kindergarten for a few years. As she has always been interested in coaching young minds, she also took on freelance jobs as a trainer and facilitator for personal development programs for children, teenagers and even adults. Her education in Psychology also helps her to understand the needs of children. This is why Shirley believes vehemently in hands-on learning and an exposure to Science at a young age. Her job is a dream come true as she can now play a bigger role in making a positive difference to all the children she encounters.

OUR PROGRAMME CONSULTANTS



Amanda Val Ng

It's been said that a person without passion is as good as a walking zombie. Passion gives a person life, passion makes a person unique. Amanda Val Ng strongly believes in that. She is passionate about communicating with people and empowering children for their future; she loves to connect with children. Having graduated from Nanyang Technological University, National Institute of Education(Singapore), Amanda has been teaching in local and International schools since 2007. Being savvy in social media and active in community services, Amanda was also appointed as an online journalist for the Singapore National Day Parade 2010. She was a Science Representative and a Teacher Mentor for NAIS - Challenge 2020 Collaboration, working with teachers and students from United States. Her education in Psychology facilitates her understanding in children's growth and needs as well as her education career development.

OUR PROGRAMME CONSULTANTS



Hilwa Razali

Hilwa Razali is a Mass Communication graduate from Murdoch University. She has previously taught English, Mathematics and Science at various local primary schools. With many years of experience in teaching children, she is now a dedicated trainer at Little Newton. As a trainer, Hilwa believes that she is able to nurture the young scientists at Little Newton and unleash their potential through fun ways of learning Science. Through inquiry-based and interactive teaching methods, Hilwa aspires to encourage each of the young scientists to explore and discover as learning Science involves opening one's mind to discover the world out there!

Primary 1 Programmes



PP 1001 Making A Tumbler/ Humpty Dumpty (Centre of Gravity)

Students will learn about Gravity and the concept of the Centre of Gravity in this module through the creation of a tumbler called "The Humpty Dumpty that doesn't fall". The creation of the tumbler then leads students to start thinking about the stability of objects seen in everyday life. Placement of the nut at different locations in the tumbler further explains the concept of the Centre of Gravity for students in this experiment.



PP 1003 Paper Chromatography (Colours and the Separation of Colours)

In this lesson, students get to create their own rainbow that doesn't disappear even after a long time. Using apparatus like filter papers and droppers to perform this experiment, students will observe the separation of colours from a water-colour pen through capillary action of filter paper that causes some colours to fade quickly or slowly. This forms the rainbow from which students will be able to compare and understand about primary and secondary colours.



PP 1005 Pan Flute (Sound)

In this lesson, students will get to explore the world of sound by creating their individualised pan flutes! Students will get to experiment by cutting straws into varying lengths to test and listen to the different pitches of sound. They will learn about wavelengths and that a shorter straw equates to a shorter wavelength which in turn produces a higher pitch. This fun lesson allows students to practise formulating hypothesis, listening and analysing the differences between sounds made from different instruments and even the voice that comes out from all of us!



PP 1002 Amazing Parachutes (Air Resistance)

In this lesson, students will be able to create their very own parachutes with the ability to descend slowly to the ground. They will be able to have their hands on items like hexagonal plastic sheets, suspension strings and a soldier figurine to create their parachute. In the process of creating their parachute, students will learn how a simple canopy can take the weight of a person, and get to do trial and error of fixing the length of their suspension strings. The highlight of the programme is the outdoor experiment students do to test out their parachute and they will observe and analyse why certain parachutes descend faster or slower and the reasons for the difference in speed of descent.



PP 1004 UV Beads (Light & Ultraviolet Light)

Getting some sunshine is beneficial for our health but too much exposure to sunlight can be harmful. Using "magical" beads that change colours under the presence of ultraviolet light, students will understand that sunlight consists of visible and invisible light. Ultraviolet rays (UV) which is the invisible light can be subcategorized into UVA, UVB and UVC. Students will understand the harmful effects of UV rays and make use of this knowledge to analyse, predict how and when to carry out protective measures the next time they go out into the sun.



PP 1006 Swinging Phenomenon/ Simple Pendulum (Conversion of Energy)

Through this lesson, students will be able to understand the theory of a swing as they construct a simple pendulum that actually works. They will learn about potential and kinetic energy and how it is converted through the use of apparatus such as pencil rods to act as the bracket supports, string for the length and gravity balls as the pendulums. Students will observe and analyse how the speed of the swing is related to the length of the string and how the gravity balls and seat of the swing also affects the speed.

PP 1007 **Belt Drives** (*Energy Transmission*)

Machines such as treadmills and conveyor belts make use of a pulley system and the science of force transmission. Students will get their hands on apparatus such as a foam boards, bobbins, screws and nuts to create their own fun-to-play-with belt drives to observe, understand and internalize the workings of such systems. Students will also in this lesson understand that the phenomenon of force transmission through the use of friction between the ribbon and the bobbin. This will aid in their understanding in the seemingly complex machines they encounter in their daily lives.

PP 1008 **Windmill** (*Wind Energy*)

Wind is a very powerful source of energy that can be harnessed to develop new forms of energy such as electricity for our homes. With this lesson, students will be able to learn about wind energy and that air flows in a horizontal direction. They will be able to make their own windmill that turns beautifully in the wind and in the process recognise the cause and effect of the wind against the windmill.

Primary 2 Programmes



PP 2001 **Maze-Running Game** (*Magnets*)

Through this lesson, students will be able to understand that magnets have two poles: the North and the South pole. They will explore the attraction and repulsion between poles and the different types of material that allows magnetism to pass through. The Maze-Running game is a mini competition where students are challenged to manoeuvre their magnetic items through a cardboard maze in the shortest possible time without falling into the traps. Students will learn through the findings derived from the game.



PP 2003 **Boomerang** (*Air Resistance*)

The Boomerang intrigues people because of its ability to deliver itself back to the thrower. In this lesson, students will discover that the trick in a returning boomerang lies in its design, which is usually flat and curved and allows for self-rotation. Students will learn that force is required to start the flight of a boomerang and the relationship between the throw, thrust, wings, lift, spin and stability of a boomerang. This popular lesson allows student to practise the process skills of experimenting, performing trial and error and problem solving to be able to throw and receive their boomerangs swiftly!

PP 2005 **Illusion** (*Conceptual Thinking of Vortex*)

When we carry one kilogram of cotton and one kilogram of iron, we will feel that somehow, the iron is heavier than the cotton. When we are sitting on a moving train, it often looks as though the trees outside are running backwards. These phenomena are distorted perceptions called illusions. In this lesson, students will learn about the interesting way that humans perceive and study various kinds of illusion, such as optical illusions, illusions on space, time and movement. Students will be amazed when they observe a series of patterned and complex pictures which can induce virtual illusion.



PP 2002 **Lighting Up a Small Electric Bulb** (*Electric Circuit*)

This lesson allows students to learn about how an electrical circuit works using apparatus such as batteries, battery boxes, tungsten light bulbs and bulb holders. They will also begin to learn about chemical potential energy, electric currents and open and closed circuits. The experiment allows students to gain confidence via trial and error in order to achieve their desired result.



PP 2004 **Wind Vane** (*Wind Energy*)

Wind cannot be seen but we feel the effects of wind when it shakes trees and messes up our hair. In this lesson, students will learn that wind is the flow of air on a large scale and that the speed is the horizontal distance that the air has flowed within a unit time. Students will assemble a wind vane that can determine the direction in which wind is blowing from and learn about the eight different wind directions.

PP 2006 **Paper Bridge Experiment** (*Civil Engineering*)

Do bridges that are used by large number of people and vehicles need to be huge in terms of volume and weight? Through this lesson, students will discover that several sheets of paper and paper cups can support weight greater than what they would expect. Students will learn that bridges are able to withstand tremendous pressure due to the compression and tension force acting on them. They will also explore and understand various types of bridges such as arch, suspension and beam bridges. Students will practise hypothesizing and enhancing their creativity skills as they construct their own bridges.



PP 2007 **Paper Tube Elevator** *(Gravitational Force)*

A world without elevators will be unimaginable and inconvenient. In this lesson students will learn how this amazing invention came about and how an elevator actually works through the construction of a model of an elevator which rises up and down under the effects of pulling force and gravitational attraction force. Students will also be able to understand the effects of gravity and how energy is transferred between complex machines that we use in our daily lives.



PP 2008 **Tiny Somersaulting Capsules** *(Centre of Gravity)*

Not everybody can perform a proper somersault, but our amazing capsule can! In this lesson, students will be able to use apparatus like steel balls, capsules and a cardboard to construct their magical capsules that can somersault down a slope! Students will learn that the steel ball is round so it can roll freely around the capsule, yet, it is heavier than the capsule so when the ball rolls over to the other side of the capsule, the capsule's centre of gravity changes. Then, the other side of the capsule will rise, making the steel ball roll about constantly and thus perform somersaults like an acrobat! Students will now be able to fully understand the concept of centre of gravity and explain how it is found in our everyday lives!

Primary 3 Programmes



PP 3001 **Boats (Buoyancy)**

Why are boats able to float in the sea? If there are two boats of different sizes, which one can carry more goods? In this lesson, students will learn that buoyancy is the ability of an object that allows it to float in water. Objects like the boat will sink if the effect of gravitational force is greater than its buoyancy and it will float upwards if its weight is less than its buoyancy. Students will also be able to apply this understanding in their lives when they go swimming and go for cruises.



PP 3003 **Ants' Kingdom (Insects)**

Ants are insects that can be found almost everywhere on Earth and can lift more than twenty times its own body weight. Students will step into the fascinating world of ants in this lesson. They will learn that ants, like all insects, have three main body parts and the 4 types of ants: queen ants, male ants, worker ants and soldier ants. Students will be able to compare and contrast the different types of ants, analyse their findings and communicate them when they complete this lesson.



PP 3002 **Balloon-Powered Helicopter** *(Action and Reaction)*

Newton's Third Law of Motion states that for every action, there is an equal and opposite reaction. This principle, like all the other theories from Sir Issac Newton applies even with simple actions like clapping our hands. Through this lesson, students will learn about aerodynamics and how the action of air escaping from the balloon can cause the helicopter to go on flight. Students will be given items like balloons, propellor blades and connectors to construct their own helicopters that goes up, up, and away! With this knowledge, students will be able to start noticing action and reaction at work in their daily lives!

PP 3004 **Interesting Solenoids** *(Electromagnetism)*

Electromagnets are "temporary magnets" that have the properties of magnets only when there is a current is flowing around it. With the aid of an intricate apparatus, students will be able to construct a complete electric circuit, which can be used to electrically magnetise a metallic object! With the apparatus, they will be able to control the magnetic property of their electromagnets by energizing or de-energizing it as and when they want. This lesson will generate curiosity and interest of students in magnets and their use in everyday objects such as electric bells and trains.



PP 3005 **Human Skeleton** (*Human Body Knowledge*)

In this lesson, students will learn about the human skeleton and how it works. Students will be able to fix up their own skeletal system and understand that the human skeleton consisting of three parts: the skull, the truncal bones and the limb bones. Learning about the functions of the human skeleton will allow students to better understand themselves and ultimately gain interest in health care education. Students will then be able to analyse and take charge of their bodily needs, exercise regularly and have balanced diets that include Vitamin D and Iron!

PP 3007 **Pop Gun** (*Air Compression*)

Air is colourless and odourless and we can hardly feel its existence unless there is wind. In this lesson, students will be able to explore this important matter that keeps us alive each day. They will use apparatus like plastic syringes and plastic tubings to construct their very own pop guns that can produce a loud 'pop' sound under the effect of air compression. Students will be able to examine how the 'pop' sound is created and infer that although air is light, it can exert powerful pressure. This will also allow students to investigate energy conversion and sound energy that are present in our everyday lives.



PP 3006 **Seed Germination** (*Plants/ Phytobiology*)

Through this lesson, students will learn to appreciate nature and be little Biologists. They will learn interesting facts about plants, for instance, that seedlings are more robust in an environment with sufficient sunshine compared to those that grow in shady places. Students will then be able to grow their own seeds and begin conducting experiments so as to compare the life cycles of various seeds in different conditions. Students' observation skills will be enhanced as they record their findings over a period of time and bring their learning out of the classroom.

PP 3008 **Self-Formulated Toothpaste** (*Chemical Reaction*)

To be able to enjoy our food, we need to clean our teeth daily with toothpaste to have strong and healthy teeth. In this exciting lesson, students will be exposed to a hands-on activity of formulating toothpaste using a mixture of ingredients consisting of water, abrasive, decontaminating, thickening and wetting agents as well as sweetening and flavouring chemical agents. This will be a lesson that will allow students to enhance many process skills such as observing, formulating hypothesis, analysing and evaluating if their experiment works in order to achieve their desired results - a successful toothpaste!

Primary 4 Programmes



PP 4001 **Insects' Movement** (*Insects' Locomotion*)

Through this lesson, students will learn about insects' movements and the general characteristics of insects in order to differentiate insects from other animals. Students will be using a paper card of a ladybird, paper straps and metal clips to construct a paper model of a ladybird with three pairs of limbs, allowing them to observe and understand insects' leg movement and how they move in the natural world. This lesson is designed to enhance students' ability to observe, analyse and evaluate living things. Students will develop greater interest to explore about insects and gain useful skills such as inferring, evaluating as well as learning fundamental scientific knowledge to cultivate a love for nature.

PP 4003 **Dinosaur** (*Fossil Science/ Archaeology*)

Dinosaurs are reptiles that existed on earth about 130 million years ago. There were different kinds of dinosaurs differing in body size, shape and eating habits. In this lesson, students will have an opportunity to work as an archaeologist to chisel off a rectangular block cast of white clay so as to extract a dinosaur figurine embedded within the cast. Students will understand that archaeology is a discipline which studies ancient history of human beings according to objects left behind and materials of ancient mankind. Besides extracting the dinosaur, students will also learn to classify dinosaurs based on the food that they consumed. Dinosaurs can be categorized into herbivores, carnivores or omnivores once their eating habits have been identified.



PP 4002 **Small Flash-light** (*Electric Circuit/ Energy Conversion*)

Electricity is widely used in our daily lives. The simplest electric circuit consists of batteries, electric bulb, wires and switch. Through this lesson, students will learn how to make a small flashlight by constructing a simple electric circuit that allows electric current to flow and illuminate a bulb. Students will learn that electric current only flows through closed circuits and any circuit which is not complete is called an open circuit. They will also be encouraged to investigate, generate possibilities, infer and evaluate certain factors that will influence the luminance of flashlight. This strengthens students' thinking skills and knowledge on electric circuits.

PP 4004 **Woodpecker** (*Gravitational Potential Energy/ Energy Conversion*)

Woodpeckers are birds that can climb and drill into trees. Woodpeckers use their sharp beaks to drill holes and obtain food from trees. In this lesson, students will fix a simple wood pecker model connected to the wood ring on rod via a spring. The experiment will allow students to observe the effect of gravity, and that vibration is the alternate motion that passes by an object's equilibrium point. Thus, this lesson is useful to equip students with more knowledge about woodpeckers as well as about gravity. Students will also be practising their observational and evaluating skills during this lesson.

PP 4005 **Jet Boat** (*Energy Conversion/ Buoyancy/ Forces*)

Jet boats rely on high-pressure air cushion to move. In this lesson, students will construct a jet boat utilizing a quadrilateral foam board and an inflated balloon which upon deflation will produce energy to allow the boat to move forward on water surface. Students will be able to observe that their jet boat model is able to float on water. Students will observe the effect of buoyancy and explore ways to make the jet boat move. This inquiry-based teaching method gives students the opportunity to enhance their learning as they develop useful skills such as observational, inferring, analysing as well as evaluating skills while experimenting with the Science kit.



PP 4007 **Drifting Doll** (*Buoyancy*)

In this lesson, students will be able to create their drifting dolls by placing 2 plastic droppers attached with metal screws in a transparent plastic bottle of blue-coloured water and upon squeezing the plastic bottle, water will flow into the plastic droppers to decrease their buoyancy causing the plastic droppers will sink. Students will be able to observe the reaction of the dolls when the bottle is being squeezed. By pressing on any part of the plastic bottle which is filled with water, the float-sink doll may bear the pressure and allow water in if there are holes. When weight increases, the bobber will sink; if released, water in the bobber will flow out and the bobber will float on the water. This concept is also commonly used in submarines. Also, through this lesson, students will get to enhance their knowledge on buoyancy and learn about Pascal's law. Hence, through hands-on activity of making a float-sink doll, students will learn the principle behind the drifting doll through their own discovery. Over time, inquiry-based and activity-based learning will develop students to become a self-directed learner.

PP 4006 **Jumping Magnet** (*Electric Circuit/ Electromagnetic Induction*)

An electromagnet is an application of the magnetic effect of electric current. The wire of an electromagnet is wound into a coil and an iron-core is placed inside the coil. The live wire causes it to become magnetic. When an electric current passes through the wire, the iron-core inside the coil will be magnetized and thus, creating a temporary magnet. Electromagnets become much more magnetic because of the overlapping of two magnetic fields. The magnetic property of an electromagnet can be controlled by switching on or turning off the electric current. An electromagnet is in fact, a live solenoid with an iron-core. The ferromagnetic core magnifies the magnetic field to thousands of times the strength of the field of the coil alone in an iron-core electromagnet. In this lesson, students will construct an electric circuit to allow a magnetic circular object to flip continuously under the effect of electromagnetic induction. Thus, such hands-on lesson will be useful to enhance students' scientific and technological thinking as well as encourage them to have spirit of exploration.



PP 4008 **Weaving Machine** (*Classification*)

The people in ancient China were masters of cloth weaving. The efficiency of weaving loom was not great until the textile weaving machine was invented by Huang Daopo in the Yuan Dynasty. Today, the weaving machine has incorporated the use of technology to liberate people from the tedious process of making clothes. Through this lesson, students will learn to make their own weaving machine capable of weaving different coloured cotton threads. By making their own simple weaving machine, students will get to learn more about technology and the origin of the weaving machine. Also, this lesson would be helpful to improve students' psychomotor skills and enhance their ability to classify objects.

Primary 5 Programmes



PP 5001 **Surface Tension- Magical Bubbles** (*Surface Tension*)

Air bubbles are made up of mixtures of water and small amount of soap. In this lesson, students will blow air bubbles from a solution containing small amount of soap which is added to reduce the surface tension of water, thus minimising the air bubbles from bursting too easily. This lesson will also enhance students' skills to observe, infer and evaluate as they carry out the process of making the magical bubbles.



PP 5002 **Self-Constructed Helicopter** (*Energy Conversion/ Aerodynamics*)

Through this lesson, students will learn how to construct a helicopter model using plastic propeller blades and rubber bands. The helicopter model in this lesson is different from other helicopter models as it is neither powered by an engine nor electricity. In this lesson, students will make a helicopter that gains its energy by making use of elastic potential energy instead of a rotor. Students will also learn that the helicopter model in this lesson will convert the elastic potential energy into kinetic energy when the helicopter flies in the air. Through constructing their own helicopter, students will understand the principles of helicopter flight. Thus, this will enhance their thinking and spirit of discovery in the long run.



PP 5003 **Tornado** *(Earth Science)*

In this lesson, students will make use of two transparent plastic bottle containers and coloured water to produce swirling waves mimicking the wave actions of a tornado. Through this tornado simulation activity, students will learn the formation principles of a tornado. The bottle with water plays the role as cumulonimbus while the connector acts as the eye and the empty bottle is like the swarm and moist surface airflow. When the water bottle is being shaken, it is like a horizontal flowing of atmosphere. As the water in the bottle rotates downwards, it will form a vortex and thus this process forms a simulation of a tornado.



PP 5005 **Pull String Doll** *(Pulling Force/ Mechanical Energy Transfer)*

In this lesson, students will get to construct a cute doll model with strings attached on it that allows the movement of the doll to be manipulated under the action of a pulling force. Students will observe and learn that when they pull the doll, frictional force will cause the doll to be pushed upwards. When the string is being released and no force is being applied on the doll, it will start to slide down. Through this activity, students will be able to recognise the advantages and disadvantages of friction in our daily lives.



PP 5007 **Bamboo Gyroscope** *(Gravity/ Stability/ Dynamic Forces)*

In this lesson, students will assemble components to construct a symmetrical bamboo gyroscope which will stabilise easily when it is being placed on a finger's pulp due to its low centre of gravity. Students will be able to observe and evaluate that in order to make an object stand still, the centre of gravity must first be set lower before its mass can be distributed evenly from left to right. When the centre of gravity is lowered, the distribution of mass will be even and thus, preventing an object from falling. Through this lesson, students will learn more about the centre of gravity, understand how and why gravity acts on an object to stabilise it. This lesson will also help to encourage students to be more observant and analytical.



PP 5004 **Revolving Doll** *(Energy Conversion/ Electric Circuit)*

In this lesson, students will construct a simple electric circuit attached to a mini motor with a rotator that allows a toy doll to revolve. Students will observe that when the switch of the electric circuit is turned on, the battery will provide power to the engine and cause the axis of the engine to turn around and providing a driving force to the doll. As supporting point, the rear of the paper doll acts as the axis of the circling movement. Students will learn the three forms of mechanical movements: translational motion, rotation motion and vibration and be able to learn and apply the knowledge about energy conversion and different types of motion in their daily lives.



PP 5006 **Musical Bottle** *(Sound Pitch/ Frequency)*

In this lesson, students will fill up plastic test tubes with different volumes of water that produce different tones of sound upon hitting by a rod. Students will infer that sound is the outcome of vibration of objects and it can travel through solid, liquid and gas but not in a vacuum. By making the Musical Bottle, students will learn that when they tap the test tube, the air in the tube will vibrate and thus it will produce sound. As the test tubes are filled with different volumes of water, the sound produced will vary in terms of tone. By varying the vibrations in the test tube, the frequency and tone produced will vary.



PP 5008 **Brush Cart** *(Energy Conversion/ Mechanical Energy Transfer/ Pulling Force)*

In this lesson, students will assemble a brush cart consisting of a brush, a driving electrical motor and batteries. Students will fix a long cotton swab on the axis of an electrical motor and tie a rubber band on the other end of the cotton swab. When the motor is powered, the cotton swab will be moved by the motor and produce a centrifugal force which will cause the brush to vibrate up and down. The brush has elastic deformation, which uses elasticity and drives the brush cart to rotate and move forward. By making a brush cart, students will be able to understand why the brush cart can run and learn more about energy conversion.

Primary 6 Programmes

PP 6001 Thermal Expansion & Contraction

(Thermal Expansion/ Contraction of Objects)

In this lesson, students will use hot water and ice water on objects to demonstrate the effects of thermal expansion and thermal contraction. Students will observe that when they place the set-up in hot water, the heat of the water will cause the air inside the bottle to expand, causing the balloon to inflate. When the set-up is placed in cold water, the cool water will cause the air inside the bottle to contract, causing the balloon to deflate. Students will also learn how a thermometer works. The knowledge gained in this lesson is useful for students as they can apply them in their daily lives.



PP 6003 Self-Made Soft Drinks

(Chemical Reaction)

Soft drinks that we all enjoy drinking tend to make us burp. When we burp, our noses feel uncomfortable. In this lesson, students will understand that such reaction is the result of carbon dioxide becoming carbonic acid that stimulates the nose. Students formulate soft drinks by mixing citric acid solution, baking soda (sodium carbonate), sugar, orange flavouring agent and clean drinking water together in a transparent plastic bottle in this lesson. Through the making of their own soft drinks, students will understand the principle behind soft drinks which will strengthen their spirit of exploration and stimulate their ability in creative thinking as well as product design and manufacturing capabilities.

PP 6005 Electrical Lantern

(Energy Conversion/ Electric Circuit)

In this lesson, students will assemble an electric circuit and connect it to power an electric lantern by utilising the concept of electric circuit and energy conversion. By making their own electric lantern, students will learn that a light bulb will only light up when there is a closed circuit allowing electrical energy to flow through the whole circuit. Students will be able to observe and infer that an electric circuit can be arranged in two manners, either in series or parallel. The knowledge gained in this lesson can easily be applied in students' daily lives.



PP 6007 Roller Coaster (Energy Conversion)

In this lesson, students will assemble paper tracks and roll them up to form a roller coaster track that allows a small metallic ball to roll under the effect of gravitational potential energy and kinetic energy. By making and experimenting with the roller coaster, students will be able to learn that the energy that an object at a height possesses is called gravitational potential energy and an object will have greater gravitational potential energy if its mass is larger or its position is higher. Students will also observe that the metallic ball will gain its kinetic energy once it is set in motion. They will then be able to infer that an object with a larger mass and travelling at a faster speed will have more kinetic energy. This lesson will inspire students' desire for knowledge, creative thinking and the initial design capacity.

PP 6002 Dissolution & Filtration- Where Has the Substance Gone?

(Purification/ Separation Science)

In this lesson, students will set up a miniature filtration apparatus to separate a mixture of water-soluble and water-insoluble substances. Students will be able to make inference based on their observation during the activity and understand the meaning of the terms 'solute' and 'solvent'. During the lesson, students will be engaged through an inquiry-based method of learning with opportunity to ask and answer questions. This will help develop students' ability to observe, classify, infer, analyse and evaluate. These learning skills will be useful to nurture students to become self-directed learners.



PP 6004 Glider (Energy Conversion/ Aerodynamics)

In this lesson, students will construct an elastic potential energy-powered glider by assembling the materials provided in the kit. Students will also learn the theory of a glider which does not have a powered unit on its own but takes off with the counter-force of air on its lifting surface. Students will be able to observe and infer that the self-made glider utilises the elastic potential energy from the rubber band to provide the energy for the glider to take off. When the glider starts to move, the elastic potential energy will be converted into kinetic energy. This will allow students to gain a deeper understanding on the knowledge behind how gliders work.

PP 6006 Steelyard

(Turning Effects of Forces/ Principle of Moments)

A steelyard generally consists of a weigh beam, hook, lifting wire, metal weights and scales. In this lesson, students will construct a steelyard capable of measuring mass of objects utilising the effects of the turning effect of forces. The steelyard that students will make in this lesson employs the principle of lever. To encourage students to be observant and think critically, students will be asked to identify the objects around them that make use of the principle of lever such as scissors and see-saws. This interactive and inquiry-based learning method would encourage students to think critically and apply the knowledge that they learn in their daily lives.

PP 6008 Bird in a Cage

(Energy Conversion/ Virtual Image)

In this lesson, students will assemble an electric circuit and connect it to power a motor with a rotator to enable a card printed on one side with a picture of a bird and the other side with a picture of a cage to spin continuously producing a virtual illusion of a bird in a cage. Through this activity, students will observe that when two or more images appear at a certain speed, it is not possible to distinguish them and they will combine to form another image. Students will understand a phenomenon called visual persistence where light on the retina produced by visual effects in the optical nerve remains for a certain period of time even after the optical image stops or disappears. Through the understanding of optical illusions, students will be able to relate this knowledge to the shooting or screening of films that make use of optical illusion for the basis of the formation of animation, film and other visual media.

Our Partner Schools

North Zone

- Admiralty Primary School
- Ahmad Ibrahim Primary School
- Anchor Green Primary School
- Anderson Primary School
- Canberra Primary School
- CHIJ (OLN) Primary School
- CHIJ St Nicholas (Primary School)
- Chongfu Primary School
- Compassvale Primary School
- Endeavour Primary School
- Evergreen Primary School
- Fernvale Primary School
- Fuchun Primary School
- Greendale Primary School
- Greenwood Primary School
- Horizon Primary School
- Huamin Primary School
- Innova Primary School
- Jiemin Primary School
- Maris Stella High (Primary School)
- Marsiling Primary School
- Mayflower Primary School
- Mee Toh School
- Montfort Junior School
- Nan Chiau Primary School
- Naval Base Primary School
- North Spring Primary School
- North View Primary School
- North Vista Primary School
- Northland Primary School
- Peiyong Primary School
- Punggol Primary School
- Qihua Primary School
- Rivervale Primary School
- Rosyth School
- Sembawang Primary School
- Seng Kang Primary School
- Si Ling Primary School
- Wellington Primary School
- Woodgrove Primary School
- Woodlands Primary School
- Woodlands Ring Primary School
- Xinmin Primary School
- Xishan Primary School
- Yio Chu Kang Primary School
- Yishun Primary School
- Admiralty Secondary School
- Ahmad Ibrahim Secondary School
- Anderson Secondary School
- Bowen Secondary School
- Canberra Secondary School
- CHIJ St Joseph's Convent
- CHIJ St Nicholas (Secondary School)
- Christ Church Secondary School
- Chung Cheng High Sch (Yishun)
- Compassvale Secondary School
- Deyi Secondary School
- Evergreen Secondary School
- Fuchun Secondary School
- Greendale Secondary School
- Hougang Secondary School
- Maris Stella High (Secondary School)
- Marsiling Secondary School
- Montfort Secondary School
- Nan Chiau High School
- Naval Base Secondary School
- North View Secondary School
- North Vista Secondary School
- Northbrooks Secondary School
- Northland Secondary School
- Orchid Park Secondary School
- Pei Hwa Secondary School
- Presbyterian High School
- Punggol Secondary School
- Riverside Secondary School
- Sembawang Secondary School
- Seng Kang Secondary School
- Serangoon Secondary School
- Si Ling Secondary School
- Singapore Sports School
- Woodgrove Secondary School
- Woodlands Ring Secondary School
- Woodlands Secondary School
- Xinmin Secondary School
- Yio Chu Kang Secondary School
- Yishun Secondary School
- Yishun Town Secondary School
- Anderson Junior College
- Serangoon Junior College
- Yishun Junior College

South Zone

- Ai Tong School
- Ang Mo Kio Primary School
- Anglo-Chinese Junior
- Anglo-Chinese Primary School
- Balestier Hill Primary School
- Bendemeer Primary School
- Blangah Rise Primary School
- Catholic High School
- Cedar Primary School
- CHIJ (Kellock)
- CHIJ (Toa Payoh) Primary School
- CHIJ-Our Lady of Good Counsel
- Da Qiao Primary School
- Fairfield Methodist School (Primary School)
- Farrer Park Primary School
- First Toa Payoh Primary School
- Gan Eng Seng Primary School
- Guangyang Primary School
- Holy Innocents' Primary School
- Hong Wen School
- Jing Shan Primary School
- Kheng Cheng School
- Kuo Chuan Presbyterian Primary School
- Marymount Convent School
- New Town Primary School
- Pei Chun Public School
- Pei Tong Primary School
- Queenstown Primary School
- Radin Mas Primary School
- Raffles Girls' Primary School
- River Valley Primary School
- St Andrew's Junior School
- St Gabriel's Primary School
- St Joseph's Institution Junior
- St Margaret's Primary School
- Teck Ghee Primary School
- Townsville Primary School
- Xinghua Primary School
- Yangzheng Primary School
- Zhangde Primary School
- Zhonghua Primary School
- ACS (Independent)
- Ang Mo Kio Secondary School
- Anglo-Chinese (Barker Road) Secondary School
- Balestier Hill Secondary School
- Bartley Secondary School
- Beatty Secondary School
- Bendemeer Secondary School
- Bishan Park Secondary School
- Bukit Merah Secondary School
- Cedar Girls' Secondary School
- CHIJ Secondary School (Toa Payoh)
- CHIJ St Theresa's Convent
- Chong Boon Secondary School
- Clementi Woods Secondary School
- Crescent Girls' School
- Fairfield Methodist School (Secondary School)
- First Toa Payoh Secondary School
- Gan Eng Seng School
- Guangyang Secondary School
- Henderson Secondary School
- Holy Innocents' High School
- Kent Ridge Secondary School
- Kuo Chuan Presbyterian Secondary School
- Mayflower Secondary School
- Outram Secondary School
- Peicai Secondary School
- Peirce Secondary School
- Queenstown Secondary School
- Queensway Secondary School
- Raffles Institution
- Serangoon Garden Secondary School
- Singapore Chinese Girls' School
- St Andrew's Secondary School
- St Gabriel's Secondary School
- St Joseph's Institution
- St Margaret's Secondary School
- Whitley Secondary School
- Yuying Secondary School
- Zhonghua Secondary School
- National Junior College
- Nanyang Junior College

East Zone

- Bedok Green Primary School
- Bedok West Primary School
- Canossa Convent Primary School
- Casuarina Primary School
- Changkat Primary School
- CHIJ Katong Primary School
- Chongzheng Primary School
- Coral Primary School
- Damai Primary School
- East Coast Primary School
- East Spring Primary School
- East View Primary School
- Elias Park Primary School
- Eunoss Primary School
- Fengshan Primary School
- Geylang Methodist School (Primary)
- Gongshang Primary School
- Griffiths Primary School
- Haig Girls' School
- Junyuan Primary School
- Loyang Primary School
- Maha Bodhi School
- Meridian Primary School
- Ngee Ann Primary School
- Northlight School
- Opera Estate Primary School
- Park View Primary School
- Pasir Ris Primary School
- Paya Lebar Methodist Girls Secondary School
- Poi Ching School
- Qiaonan Primary School
- St Anthony's Canossian Primary School
- St Hilda's Primary School
- St Stephen's Primary School
- Tampines North Primary School
- Tampines Primary School
- Tanjong Katong Primary School
- Tao Nan School
- Telok Kurau Primary School
- Temasek Primary School
- White Sands Primary School
- Yu Neng Primary School
- Yumin Primary School
- Anglican High School
- Bedok Green Secondary School
- Bedok North Secondary School
- Bedok South Secondary School
- Bedok Town Secondary School
- Bedok View Secondary School
- Broadrick Secondary School
- Chai Chee Secondary School
- Changkat Changi Secondary School
- CHIJ Katong Convent
- Chung Cheng High School (Main)
- Coral Secondary School
- Damai Secondary School
- Dunman High School
- Dunman Secondary School
- East Spring Secondary School
- East View Secondary School
- Geylang Methodist School (Secondary)
- Greenview Secondary School
- Hai Sing Catholic
- Junyuan Secondary School
- Loyang Secondary School
- MacPherson Secondary School
- Manjusri Secondary School
- Ngee Ann Secondary School
- Pasir Ris Crest Secondary School
- Pasir Ris Secondary School
- Paya Lebar Methodist Girls Primary School
- Ping Yi Secondary School
- Siglap Secondary School
- Springfield Secondary School
- St Anthony's Canossian Secondary School
- St Hilda's Secondary School
- St Patrick's School
- Tampines Secondary School
- Tanjong Katong Girls'
- Tanjong Katong Secondary School
- Telok Kurau Secondary School
- Temasek Secondary School
- Victoria School
- Tampines Junior College
- Temasek Junior College
- Victoria Junior College

West Zone

- Assumption Pathway School
- Beacon Primary School
- Boon Lay Garden Primary School
- Bukit Panjang Primary School
- Bukit Timah Primary School
- Bukit View Primary School
- CHIJ (Our Lady Queen of Peace)
- Chua Chu Kang Primary School
- Clementi Primary School
- Concord Primary School
- Corporation Primary School
- Dazhong Primary School
- De La Salle School
- Fuhua Primary School
- Greenridge Primary School
- Henry Park Primary School
- Hong Kah Primary School
- Jurong Primary School
- Jurong West Primary School
- Juying Primary School
- Keming Primary School
- Kranji Primary School
- Lakeside Primary School
- Lianhua Primary School
- Methodist Girls' School (Primary School)
- Nan Hua Primary School
- Nanyang Primary School
- Pei Hwa Presbyterian Primary School
- Pioneer Primary School
- Princess Elizabeth Primary School
- Qifa Primary School
- Rulang Primary School
- Shuqun Primary School
- South View Primary School
- St Anthony's Primary School
- Teck Whye Primary School
- Unity Primary School
- West Grove Primary School
- West View Primary School
- Xingnan Primary School
- Yew Tee Primary School
- Yuhua Primary School
- Zhenghua Primary School
- Assumption English School
- Boon Lay Secondary School
- Bukit Batok Secondary School
- Bukit Panjang Government High School
- Bukit View Secondary School
- Chestnut Drive Secondary School
- Chua Chu Kang Secondary School
- Clementi Town Secondary School
- Dunearn Secondary School
- Fajar Secondary School
- Fuhua Secondary School
- Greenridge Secondary School
- Hillgrove Secondary School
- Hong Kah Secondary School
- Hua Yi Secondary School
- Hwa Chong Institution
- Jurong Secondary School
- Jurong West Secondary School
- Jurongville Secondary School
- Juying Secondary School
- Kranji Secondary School
- Nan Hua High School
- Nanyang Girls' High School
- New Town Secondary School
- NUS High School of Math and Science
- Pioneer Secondary School
- Regent Secondary School
- River Valley High School
- Shuqun Secondary School
- Swiss Cottage Secondary School
- Tanglin Secondary School
- Teck Whye Secondary School
- Unity Secondary School
- West Spring Secondary School
- Westwood Secondary School
- Yuan Ching Secondary School
- Yuhua Secondary School
- Yusof Ishak Secondary School
- Zhenghua Secondary School
- Anglo-Chinese Junior College
- Jurong Junior College
- Millennia Institute
- Pioneer Junior College



Should you require more information, please contact our education consultants at (65) 6836 6466 or write to info@mastereign.com to make appointments for further discussion.

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