Physical World Unit/Moving Things

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| **Stage**  | **Timing: 7-8 weeks/ 1 hour per week** |
| **Knowledge and Understanding Outcomes** | **Skills Outcomes** |
| Objects move in different ways; objects have different shapes; objects move in different ways depending on their shape. | Science K-10* STe‑1VA shows interest in and enthusiasm for science and technology, responding to their curiosity, questions and perceived needs, wants and opportunities
* STe‑4WS explores their immediate surroundings by questioning, observing using their senses and communicating to share their observations and ideas
* STe‑5WT uses a simple design process to produce solutions with identified purposes
* Ste-6NE identifies the way objects move depends on a variety of factors
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| **Content – Key Ideas** | **Values and Attitudes Outcomes** |
| Students develop an understanding on how things move. They explore the push and pull forces they can use to move objects in such ways such as sliding, bouncing, and spinning. Through investigations, students observe and gather evidence about rolling objects and explore the idea of fair testing. | * STe‑1VA shows interest in and enthusiasm for science and technology, responding to their curiosity, questions and perceived needs, wants and opportunities
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| **Vocabulary**  | **Learning Support** |
| Push, pull, motion, force, bouncing, spinning, rolling, power etc. | ***Students with learning difficulties******Gifted and talented students*** |
| **Assessment** | **Learning across the Curriculum** |
| Students will be able to:* Identify and describe some things that move, the ways they move and the parts that enable them to move.

Represent ideas about movement through drawing, writing and discussion. | Aboriginal and Torres Strait Islander histories and cultures Asia and Australia’s engagement with Asia Sustainability Critical and creative thinking Ethical understanding Information and communication technology ability Intercultural understanding Literacy Numeracy Personal and social capability Civics and citizenship Difference and diversity Work and enterprise  |
| **Quality Teaching Framework** |
| ***Intellectual Quality***Deep KnowledgeDeep UnderstandingProblematic KnowledgeHigher-Order ThinkingMetalanguageSubstantive Communication | ***Quality Learning Environment***Explicit Quality CriteriaEngagementHigh expectationsSocial SupportStudents’ self-regulationStudent direction | ***Significance***Background KnowledgeCultural KnowledgeKnowledge IntegrationInclusivityConnectednessNarrative |

**Lesson 1 - Focus**

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| Outcome | Content | Teaching and Learning Activities | Resources | Notes and Register |
| STe‑1VASTe‑4WSSTe‑6NE | Early Stage 1 - Working ScientificallyStudents communicate by:using a range of methods to share observations and ideas, such as drawing, informal and guided discussion, role-play, contributing to joint construction of short texts and/or using digital technologies (ACSIS012)  * working in groups to reflect on what they found interesting, liked or disliked about what they did, what was or was not expected and what they would do differently
 | Lesson 1:**Movers and Shakers**1. Introduce and play musical statues, in which students move freely to music.
2. Introduce the idea of being still, such as;

'What does it mean to be still?'"Have you ever had to be still?""Where and when do you have to be still?"3. Play musical statues as a class or in pairs. | Music/CD |  |

**Lesson 2 - Focus**

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| Outcome | Content | Teaching and Learning Activities | Resources | Notes and Register |
| STe‑1VASTe‑4WSSTe‑6NE | Early Stage 1 - Natural Environment The way objects move depends on a variety of factors, including their size and shape. (ACSSU005)Students:* observe the way a variety of familiar objects move, e.g. sliding, rolling, spinning and bouncing on the ground
* identify that the way an object moves depends on its size and shape, e.g. tennis balls and blocks
 | Lesson 2:**On the Hunt for things that move;**1. Talk about how toys, animals, people and transport may move e.g. roll, slide, push, pull, fly, cogs etc.2. What gives these objects the energy for movement?3. Using an I-pad or digital camera explore how things move around the school/classroom such as bikes, small animals, cars, leaves or toys allow the students to discuss in small groups their findings.4. If possible discuss as a whole class the pictures they took.5. Ask students to write/draw in their science journals something they saw move inside the classroom, in the school grounds or outside the school grounds. | Scootle resources**Pushing and pulling** TFL-ID L700<http://www.scootle.edu.au/ec/resolve/view/L700>Assorted moving toys, camera/I-Pad |  |

**Lesson 3 - Focus**

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 | Lesson 3:**Animals that move:**1. Children discuss and demonstrate the movement of a variety of animals.2. Introduce selected small animals to the class.3. Children observe, discuss and role play various movements of animals such as jump like a kangaroo, fly like a bird, slither like a snake and climb like a monkey.4. Classify animals how they move, writing their observations in the science journal.  | Assorted moving animals poster/pictures |  |

**Lesson 4 - Focus**

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 | Lesson 4:**To investigate how far cars will travel with and without a push or a pull.****Observing and exploring** (asks questions, pose problems, find out what is currently known)* What does a push feel like? In groups of three, students take turns to rock the middle person forwards and backwards without letting them fall over. What does the pusher feel like? What does the catcher feel like? What does the person being pushed feel like?

What does a pull feel like? With a strong rope and in small groups students have a tug-o-war. When your team is being pulled how does it feel? When you are pulling how does it feel? When is the marker in the middle of the rope not moving?Discuss: What is making you move? (energy) Where did the energy come from? (the push) Who supplied the energy for the push? (students) Where does our energy come from? (food, rest, water)How far can we make them move?Students bring toy/model cars for the activity. (or the teacher provides them)Look at the collection of cars; predict what will make them move.Look at the differences - will these make a difference? (Weight, size, length etc.).How can we make our cars move? (push, pull) How can we make them move faster?Let each student use their car to see who can push it the farthest without rolling over. Whose car went the farthest? Why did some cars move further than others? (harder push, wooden surface instead of carpet, wheels) How can we get our car to move further? (push it harder)**Hypothesising and predicting** (define a problem that can be investigated scientifically)* What do we want to find out? Teacher poses the problem: How far can we get our car to travel without pushing or pulling it?
* Students discuss how they could make their car move without pushing or pulling it. (ramps)
* What do you think will happen? Students predict what will happen when their car is released on the ramp? (Assessment activity)
 | Assorted toy cars, rope Or skipping rope, ramps i.e. books, metre ruler |  |

**Lesson 5 - Focus**

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 | **Devising and testing** (describe a procedure for collecting data, identify appropriate equipment to carry out the procedure* Introduce the CMS (‘Cows Moo Softly’) concept of investigation i.e. **C**hange one thing, **M**easure one thing, keeping everything else the **same**. With teacher direction discuss whether the last test was fair (different cars, different surfaces, different pushes)
* How can we make our next test fair? What can we keep the same? (ramp height, ramp surface) What can we change? (cars)
* Students discuss with teacher guidance the designs before choosing one ramp for the investigation.
* What will we need to test our prediction? (ramp, cars, method of recording)
* In small groups students design on paper a ramp using materials that can be found in the classroom. (Long blocks, paint boards, plasticine boards, blocks etc.)
* Provide each student with a different matchbox or plastic car.
* With teacher direction students discuss: How will we keep track of how far the cars travelled, which cars were used? Which ramp was used? (tables, recount, pictures)
* In small groups students construct a table for recording data. After teacher led discussion one table is chosen and refined if necessary.
* How will we measure and record the information? (masking tape, measuring tape, table, textas) From where will we measure the distance?

 **Collecting and recording** (use the procedure and equipment to collect and record data)* Students release their cars on the ramp in turn, marking how far they travelled.
* On a large class recording table teacher models how to record the type of car, type of ramp and how far they travelled.

**Analysing and drawing conclusions** (reach a conclusion which is communicated to others)* Whose car travelled the farthest? Look at the table to see whose car travelled the farthest

Discuss: Was it a fair test? (different cars, same ramp, same surface) | Ramps, cars, paper,Lego, plasticine, blocks, paint boards, match box cars and plastic cars, textas, tape |  |

**Lesson 6 - Focus**

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 | Lesson 6:* Students should now have a stronger understanding of energy causing push and pull in living things. Teacher re-introduces concept of how nonliving things can move independently with energy sourced by different mediums for example, batteries. Students bring in their favourite moving toy to show to class. Students should be able to explain what the toy is; what it can do; what its energy source is and how it moves (rolls, spin, fly.)This allows teacher to assess, observe and analyse what is currently known by students, whilst students help each other by peer tutoring. Some students may show deep understanding by questioning specifically how an object moves without batteries, such as with rubber bands or cogs. Teacher should answer these questions as the need arises; however allow students to use their problem solving skills initially. It is important to keep this task as open-ended as possible, and allow students to explore the topic further and seek answers to questions by thinking and experimenting. As a class, students collect and record their data on a large poster. To extend this activity, teacher could create a graph with the students of which was the most popular way for a toy to move - roll, spin, fly? This requires the students to use their higher order thinking skills; to synthesise and evaluate the knowledge they have acquired.
 | Assorted moving toys such as toys with cogs, batteries, solar power, elastic bands |  |

**Lesson 7 - Focus**

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 | CONCLUDING THE UNIT* Students work with buddies to create their own short multimedia presentation (3-4 slides) of the things they have learnt, answering the content questions. Students may use digital photos from initial work with buddies and photos from experiment with toy cars. Buddies will need to give positive support to students and allow students to do as much of the presentation as they feel they are able. Students may just wish to paste pictures of objects which can be pushed or pulled or they may choose to show different examples of energy. The completion of the presentation can be used to conclude the unit. The class may decide to celebrate their learning by inviting other classes or parents to come and watch their presentations. Students may present their work independently or with their buddies. Presentations may also be uploaded to the school intranet or website. The teacher takes anecdotal notes about the presentations and adds this to information gained from other assessments to provide an overview on student learning and understanding.
 | Cameras/I-Pads, digital media |  |