# *Spinning tops of Aboriginal and Torres Strait Islanders* **Teacher background notes**

**In this investigation, students explore how push/pull forces can be applied to make an object move within the context of spinning tops. They observe the characteristics of successful spinners, and notice how a force is applied to set them in motion, or to make them stop.**

## [Australian Curriculum: Science links](https://assist.asta.edu.au/resource/4138/indigenous-spinning-tops-year-2-cle)

## Learning intentions

Students will be able to:

* ask questions about, and describe changes to, objects and materials;
* identify examples of where science is used in people’s daily lives;
* predict outcomes of investigations;
* use informal measurements to make and compare observations with those of others;
* record and represent observations and communicate ideas in a variety of ways;
* use discussion to sort information and compare ideas.

## Suggested time for this CLE

The time need to complete the *Spinning tops of Aboriginal and Torres Strait* *Islanders* CLE will depend on the depth of the prior knowledge of students, the time to perform the introduction and sorting activities, and the investigation ‘Make a spinning top’ as well as following up with any further extension activities. Allow 2–4 hours.

## Prior conceptual knowledge

Science / Year Foundation / Science Understanding / Physical sciences

Content description:

*The way objects move depends on a variety of factors, including their size and* shape [(ACSSU005)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU005)

## New concepts to be introduced

The concept of push and pull and forces can be challenging for primary students. As young students are not ready to develop a deep understanding of the differences between energy and force, much of the explanation of forces is inaccessible to them. Nevertheless, primary students are capable of observing the relationship between force and movement, and they can be supported to use scientific terms, such as ‘force’, ‘push’, ‘pull’ and comparative terms such as ‘further’, ‘longer’, ‘faster’, 'slower’ appropriately.

During these initial explorations, teachers will encounter various student misconceptions. Purposeful teaching will equip students with the content knowledge and investigation skills they will require to successfully tackle more advanced concepts as they come across them in the upper primary grades and beyond. The activities in this CLE will help students develop their understanding that forces can be a push, pull or a combination of both, that they can vary in strength, and that applying a force differently will affect how an object moves.

## Possible misconceptions

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| **STUDENTS MAY THINK…** | **INSTEAD OF THINKING…** |
| Static objects cannot exert forces (not moving implies no force is exerted). | Static objects can exert a force (e.g. a wall or floor or another object can stop an object from moving). A force is needed to change the motion or direction of an object. |
| Forces start a motion, but do not stop it. Stopping is attributed to the lack of action to keep the object moving: 'The push wore off'. |
| The size or direction of the push, pull, squeeze, or hit does not relate to the subsequent movement of the object. | ‘Pushes’ move an object away from the source of the force, while ‘pulls’ move the object towards the source of the force.  The strength of the force will influence the movement (e.g., a stronger push can cause an object to move faster or further). |
| The specific parts of the object (wheels or legs, for instance) have an in-built ability to move. 'People move because they have legs.' | An object moves because a force has been exerted on it. |
| Things as either moving or not moving. | There are different kinds of motion such as ‘at rest’, ‘speeding up’, ‘slowing down’, ‘travelling at a constant speed’ or ‘changing direction’. |
| Pushes and pulls always cause movement or keep objects moving. | Moving, stopping and at rest objects are subjected to push and pull forces and the effects of the applied force will depend on the object and other forces (e.g. friction, gravity) acting on the object. |

## Links to further information

Australian Academy of Science. 2012. *Push-Pull Year 2 Physical sciences*, *PrimaryConnections*, <https://primaryconnections.org.au/resources-and-pedagogies/curriculum-units/push-pull>

‘Pushes and Pulls’, Victoria Department of Education and Early Childhood Development website, <http://www.education.vic.gov.au/school/teachers/teachingresources/discipline/science/continuum/Pages/pushespulls.aspx>