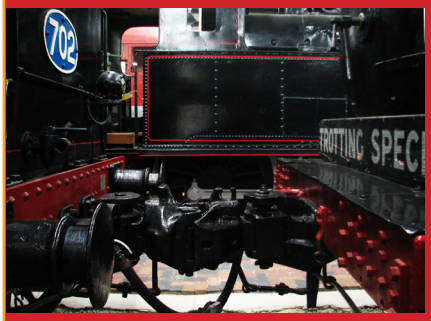
Push and Pull - Simple Machines

To the teacher

About the Pack



Teacher

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The pack is designed around the display and rolling stock in the Fitch Pavilion, which relates to simple machines - Push and Pull. **Worksheet** is **self-guided** and is supported with a **Museum map** and **Answer sheet**.

About Push and Pull - Simple Machines at the Museum

Definitions to know:

Work - done when an applied force causes an object to move in the direction of the force

Energy - ability to cause change; can change the speed, direction, shape or temperature of an object

Load - the weight being lifted by the simple machine

Effort - effort is the force placed on the simple machine to move the load

What are simple machines?

- simple machines are tools that make work easier
- simple machines make work easier for us by allowing us to **push or pull** over increased distance
- they have few or no moving parts
- simple machines give us an advantage by changing the amount, speed, or direction of forces

Types of simple machines

Two groups:

Inclined planes

- ramp
- wedge
- screw

Levers

- lever
- wheel and axle
- pulley

In the Museum you find many simple machines - wheels, axles, ramps, levers, pulleys

You can also find may complex machines made up of two or more simple machines working together. The railway uses many different types of machines to make work easier for people.

Science **Year 3**	
Curriculum content descriptions With guidance, identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge (ACSIS053)	**Elaborations** • choosing questions to investigate from a list of possibilities • jointly constructing questions that may form the basis for investigation • listing shared experiences as a whole class and identifying possible investigations • working in groups to discuss things that might happen during an investigation
Science **Year 4**	
Processing and analysing data and information Compare results with predictions, suggesting possible reasons for findings (ACSIS216)	**Elaborations** • discussing how well predictions matched results from an investigation and proposing reasons for findings • comparing, in small groups, proposed reasons for findings and explaining their reasoning
Maths **Year 3**	
Measurement and Geometry Measure, order and compare objects using familiar metric units of length, mass and capacity (ACMMG061)	**Elaborations** • recognising the importance of using common units of measurement • recognising and using centimetres and metres, grams and kilograms, and millilitres and litres
Maths **Year 4**	
Curriculum content descriptions Compare angles and classify them as equal to, greater than, or less than, a right angle (ACMMG089)	**Elaborations** • creating angles and comparing them to a right angle using digital technologies

Science **Year 7**	
Science Understanding Change to an object's motion is caused by unbalanced forces, including Earth's gravitational attraction, acting on the object (ACSSU117) • investigating a simple machine such as lever or pulley system	**Elaborations** • investigating the effects of applying • different forces to familiar objects • investigating common situations where forces are balanced, such as stationary objects, and unbalanced, such as falling objects • investigating a simple machine such as a lever or pulley system • exploring how gravity affects objects on the surface of Earth

Design and Technologied **Foundation to Year 2**	
Knowledge and Understanding Explore the characteristics and properties of materials and components that are used to produce designed solutions (ACTDEK004)	**Elaborations** • developing new meanings for objects and action during play, for example exploring how household packaging can be used to represent other objects • exploring systems used in the classroom or community for creatively dealing with problems and needs, for example storage systems for equipment, traffic system flow for drop and go zones, the use of hoists and ramps to facilitate access • exploring facilities in local environments for accessibility and environmental impact, for example location of bike tracks and sporting fields using digital maps to view local area • experimenting with techniques to combine or alter materials to satisfy a function

Resource design

This pack has been designed in accordance with the SACSA framework. Material is most suitable for **Year 3, Year 4, Year 5, Year 6, Year 7.**

For the Student

Suggested **Support Material,** comprising of sheets A to E, which will help you in your preparation. Bring your **Worksheet** - comprised of seven questions, when you visit the Museum.

Push and Pull Worksheet

1 Locomotives push and pull many different types of things.
Explore the Fitch Pavilion
Draw a line to match the name of the wagon to the photo

SAR Carriage 3

Provision Van

Caboose No 4367

Wooden Tool and Goods Van No 251

2

Find the Glenelg Line Signal, located near row 3.
Find a lever, wheel and pulley. You can operate
this interactive exhibit.

Pull the lever to move the signal. If the arm is pointing straight out should the train stop or go? (Clue: read the instructions)

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Demonstrate/explain how this lever makes heavy work easier

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3

Go to the large platform - Break of Gauge Platform
in the Fitch Pavilion

What simple machines can you find on the platform?

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Is the machine a example of a lever or a pulley?

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do you push or pull the machine?

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.....

also discuss

- ramps/platforms versus stairs
- luggage and goods
- height of ramps
- energy and force to move objects
- do you need less energy and force to move objects with a platform

4 Power/energy

Introduction

Types of power/energy have been used over time to help move wagons, vans, carriages etc

Find the MIC 4 (refer to your map and photo)
Complete the sentence, by underlining the correct answer.
The car was operated by steam/motor/hand?

Find the locomotive - Rx93
Underline the type of power that moves this locomotive

electricity people chemical diesel steam movement

Find the fire truck in the photo. It is near the entrance of the Fitch Pavilion. Sorry you cannot move this exhibit.

Can you find a lever, axle or wheels? How is the truck moved?

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Look at the display in The Long Journey - Women In Railways.

Find the red Hard Yakka 3 wheel Pump Trike

Complete the sentence, by underlining the correct answer.

The trike was operated by motor/steam/hand?

Is the trike moved by pushing or pulling?

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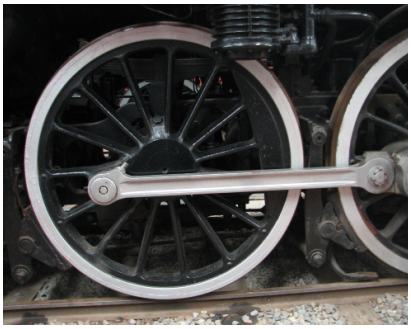
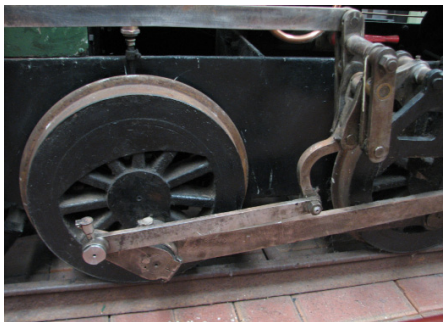
Can you find a lever?

5





Wheel and Axle
Introduction

- *the axle is a rod that goes through the wheel and lets the wheel turn*

Explore the museum. Discuss the size of locomotive wheels. Look for the axle.

How was the Explosives Van moved?

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6

Go to the Model Railway and the display cases (refer to your map)
List the toys and models that can be pushed and pulled.
Discuss the objects in the Model Railway how are they moved/ powered in real life.

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