



# WHAT ARE SIMPLE MACHINES?

## Lesson Ideas

These curriculum-linked lesson ideas and activity sheets offer a range of learning experiences for primary and middle years students on the topic of simple machines.

## Broad learning outcomes

Using this curriculum material will assist students in achieving the following broad learning outcomes:

- Students will learn how various simple machines work.
- Students will recognise how simple machines are used in real-world situations.
- Students will be able to define and list examples of simple and compound machines.

## English

- Students to write a description and explanation of each type of simple machine. They could collate this information into a text that could be used by a younger class.
- Students to write a definition of 'compound machine' and list some examples.
- Students to brainstorm as many words as possible around the topic of simple machines. These can be recorded in student's books or used to create a class word wall. Students will add to this as they learn new words.
- Students to complete the '**KWL chart**' or '**TWLH chart**' activity sheet.

## Mathematics

- Students to go for a walk around the school looking for different types of simple or compound machines then complete the '**Surrounded by machines**' activity sheet.
- Students to complete the '**Investigating pulleys**' activity sheet. Relate the results to the use of pulleys to gain a mechanical advantage.

## Science

- Students to conduct some experiments using simple or compound machines to move various loads.



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- Students to build a basic see-saw and explore how the weight and placement of the loads on each end affect the balance. Students should record their findings.
- Students to investigate how simple machines act as a force on other objects to push or pull them. How do they help people to exert force on large objects?

### Humanities and Social Sciences (History, Geography, Civics and Citizenship, Economics and Business)

- Students to research to discover how simple machines were used by ancient builders to construct buildings such pyramids.
- Class discussion: How would our lives be different if we had no machines or tools? In groups, students to prepare a speech for the class in response to this question.
- Students to research and discuss the role of machines in the industrial revolution.
- Students to research the history of the wheel. When was it invented, where and for what reason? How has it changed over time?

### Technologies (Design and Technologies, Digital Technologies)

- Students to design a playground using a variety of simple and compound machines. Once designed, students may wish to make a model of one piece of equipment and explain how it utilises one or more simple machines.
- Students to identify a common everyday problem that could be solved by a simple or compound machine. In small groups, students work to design a machine that would be able to do the task. This can be as realistic or as creative as they like. The design should be labelled with the types of simple machines it contains. If time and resources permit, students could use recycled materials to make a model of their machine.
- Students to bring examples of simple machines to create a display table. These could be sorted and classified using the '**Classifying cards**' (printable cards can be found with the activity sheets).
- Provide students with a simple problem to be solved (such as moving a box from one point to another, or from the floor to a shelf). In small groups, students work together to devise a way to solve the problem using simple machines. They consider how they could use a pulley, inclined plane, wheel and axle or a combination of these. Once they have designed a solution, they should test it.



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- Students to watch the '**Simple machines animation**' (in the Extra resources section), identify how many simple machines they can see and explain how they are working.
- Students to complete the '**The simple machine advantage**' activity sheet.
- Class discussion: Why do we need machines and tools?

### Health and Physical Education

- Many pieces of sporting equipment (e.g. bats, fishing rods, racquets etc.) use simple machines or demonstrate the principles of load, effort and fulcrum. Students to choose one piece of equipment and explain how it is used.