

Simple Machines

Before Reading

Motivation / Purpose

The purpose of this text is to explain how simple machines make it easier for people to do work. The text links with the key learning area *Science* and the strand *Physical Science*.

Text Type

Draw students' attention to the:

- chapter titles
- photographs and labels
- glossary and index.

Ask, "What type of book is this?" (Explanation)

Visual Literacy

Describe what is happening on the front cover. How is the boy moving the bricks?

Browse through the pages of this text and examine the design and colours used. How do the design features such as boxes, headings, borders and background images remind you of machines and tools?

Background Knowledge

Ask students to explain what a machine is. Then explain to them what a simple machine is – a machine with no or few moving parts.

Name the simple machines discussed in the book (lever, inclined plane, wedge, screw, wheel and axle, and pulley) and ask students to list what they know about each one.

Phonological Awareness

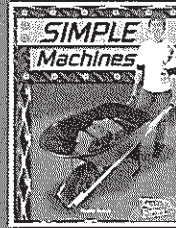
Make sure students know these phonological patterns:

- ar: far (p.5), parts (p.6), arm (p.9), apart (p.14)
- long e: easier (p.4), lever (p.8), piece (p.9)
- ew: use (p.6), used (p.8), screw (p.16)
- u: push (p.5), pull (p.5), pulley (p.22)

Find words in the text containing these sounds. Make two flash cards for each word. Underline the letters representing the sounds. Place cards face down. Have students turn over two cards at a time. If the two words have the same sound, the player keeps the cards. If the words contain different sounds, the play moves to the next person. The winner is the player with the most pairs.

Vocabulary

applied, axe, axle, chisel, effort, fulcrum, inclined, lever, machine, plane, pull, pulley, push, ramp, screw, shaft, simple, wedge, wheel



Write p _ _ ts. Ask students to fill in the missing letters to make the /ar/ sound in parts. Repeat with other words from the list above.

High Frequency Words

another, apart, easy, heavy, lift, moving, objects, parts, up, use, used, without, work

Have students write the words using Look, Cover, Write, Check. Discuss strategies for decoding and recalling words: breaking a word into syllables (with-out); identifying prefixes, suffixes and base words (apart – a + part); looking for smaller words within words (used – use).

During Reading

Vocabulary in Context

Check students' understanding of words in the vocabulary box. Have them define familiar words. Remind them to check the meaning of unfamiliar words as they read, using the text or glossary. Ensure students understand the difference between key words and high frequency words. Write a sentence from the text containing key words. Ask the students to identify the key words in the sentence that are specific to the topic.

Checking for Meaning

Literal:

What are the two types of simple machines? (p.6, p.7)
What can a lever be used to lift? (p.8)
What is a screw often used for? (p.19)

Inferential:

How can the head of a hammer be used as a lever?
Why would it be easier for a person in a wheelchair to use a ramp rather than stairs?
What sorts of things might a pulley be used to lift?

Make sure students understand the difference between literal and inferential information.

Response:

What new facts did you learn about simple machines?

Grammatical Patterns

Make sure students understand the following components of an explanation:

- Identifying statement about what is to be explained: *A simple machine is a machine with no, or few, moving parts. Simple machines can be easy to use, but they still do a lot of work.* (p.5)
- Series of events explaining the phenomena: *A lever has an arm that moves about a point called a fulcrum. When effort is applied to one end of the lever, the other end goes up or down.* (p.9)
- Concluding statement: *With a pulley, one person can lift an object that it would take many people to lift without a pulley.* (p.23)
- General nouns: *machine* (p.4), *people* (p.4), *objects* (p.5)
- Technical language: *lever* (p.8), *fulcrum* (p.9), *plane* (p.12), *inclined* (p.12)
- Timeless present tense: *A plane is a flat surface.* (p.12)
- Adverbial phrases of time: *When effort is applied to one end of the lever, ...* (p.9), *As the wheel on the pulley turns, ...* (p.23)
- Noun groups to build information: *an inclined plane* (p.12), *the pointed edge* (p.14)

Fluency / Punctuation Patterns

Commas separate principal clauses in compound sentences, and adverbial phrases in complex sentences, to explain cause and effect: *Screws are often used to hold objects in place, or to hold two objects together.* (p.19) *As the wheel on the pulley turns, the rope or chain moves and the heavy object is lifted or lowered.* (p.23) Demonstrate how to read these sentences, grouping clauses or phrases together, and pausing at the commas. Have students reread the sentences three times to gain fluency.

These punctuation patterns occur in the text:

- Commas separate items in lists: *push, pull, lift or carry* (p.5), *helicopters, ferris wheels and steering wheels* (p.21) Note the omission of the comma before 'or' or 'and'.
- Apostrophes indicate a contraction: *don't* (p.5), *wouldn't* (p.10)
- Capital letter for proper nouns: *David, Michelangelo, Italy* (p.15)

Critical Literacy

What did the author need to know to write this text? How well did this book explain simple machines? Why is it useful to understand how things work?

Linking Visual and Written

Discuss the use of labels in this text. How do the labels help you understand the different parts of the simple machines? Examine the use of labels on pages 6–7 to list items not mentioned in the text.

Look at the photograph on page 11. What simple machine is the boy using? (a lever) What is the other name we call the item the boy is using? (a wheelbarrow)

After Reading

Ask students to list what they know about simple machines after reading the text, and compare this list with those they prepared before reading. Find sentences of cause and effect and read the beginning clause or phrase, then ask students to read the effect. For example, read "*When effort is applied to one end of the lever, ...*" (p.9), then students read "*the other end goes up or down.*" Find more examples of cause-and-effect sentences in the text to read in this way.

Activities

Students will:

- use technical vocabulary to complete a cloze activity
- add suffixes to base words to fill the gaps in sentences
- find and record words containing a particular sound
- match parts of sentences to make statements of cause and effect, and write glossary definitions.

Comprehension (meaning) Vocabulary (structure) Phonics (visual) Writing (structure)

