



CLIL LESSON PLAN

Basic Mechanics: The Secrets of the Machines That Help Us



LESSON OVERVIEW

Subject(s)	Physics · Technology
Age Group	11–14 years old
Duration	45 minutes
CEFR Level	B1



LEARNING OBJECTIVES

Content Objectives

- Students will be able to identify and name the three main simple machines (lever, pulley, inclined plane).
- Students will be able to associate an everyday object (e.g., scissors, knife, ramp) with the simple machine it represents.
- Students will be able to describe in a simple sentence how each machine makes work easier (e.g., 'We use a lever to lift heavy objects with less effort').
- Students will be able to classify a set of everyday objects into one of the three categories of simple machines (lever, pulley, inclined plane) and justify their classification using a simple sentence.

Language Objectives

- Students will be able to understand and use key vocabulary related to simple machines (e.g., lever, pulley, inclined plane, wheel, scissors, ramp). Key vocabulary is displayed on a classroom poster throughout the lesson; pronunciation is modelled by the teacher and practised chorally at the start of the session.
- Students will be able to read and associate the name of a simple machine with its graphic representation or with an everyday object.
- Students will be able to correctly label a diagram or drawing with the name of the simple machine.
- Students will be able to write simple descriptive sentences about an object using the structure: 'The [object] is a [simple machine].'
- Students will be able to describe orally what an object is used for using active sentence structures (e.g., 'We use the ramp to lift heavy loads'; 'People use scissors to cut'). Note: passive structures are avoided in student production in line with CLIL recommendations; active forms are modelled and displayed on the board for reference.



- Students will be able to classify an object and present their classification to a small group or to the class, using the sentence frame: '[Object] is a [simple machine] and we use it to [simple action].'
Preparation and rehearsal time in pairs is provided before any group or class presentation.
- Students will be able to interact in the classroom to ask for and give materials during the classification activity, using the Language for Learning phrases displayed on the board.

COMMUNICATION SKILLS

- Identify and associate the name of a simple machine with its graphic representation or with an everyday object.
- Read and follow instructions of up to three steps for assembling or classifying objects. Before beginning each activity, the teacher uses ICQs to verify comprehension (e.g., 'How many steps are there?', 'What do you do first?', 'Are you working alone or in pairs?').
- Read the labels on everyday objects (e.g., bottle openers, tweezers) for classification purposes.
- Listen to and extract the main function of each machine from the teacher's explanation, supported by a short video or physical model. Where possible, the video should be available in students' first languages or include subtitles.
- Follow classroom instructions for working in pairs and handling objects safely.
- Label the classified objects with the name of the simple machine they represent.
- Write simple lists of objects that are levers, pulleys, or inclined planes.
- Complete simple summary sentences using key vocabulary (e.g., 'Scissors are a ___'; 'A ramp is a type of ___').
- Orally describe what an object is used for using active sentence structures and simple action verbs (e.g., 'We use the ramp to move heavy objects more easily'; 'People use scissors to cut').
- Use classroom language to cooperate and negotiate the classification of an object with a partner (e.g., 'Is this a lever or an inclined plane?', 'I think it goes here', 'Do you agree?').
- Present the classified object to a small group or to the class, naming the simple machine it belongs to and what it is used for, after preparation and rehearsal time in pairs.

GRAMMAR, VOCABULARY & PRONUNCIATION

Language of Learning (CALP)

Students at this level are likely to know several of these concepts in their first language. Before introducing the English terms, the teacher elicits prior knowledge: 'Do you know what this is called in your language?' The teacher writes the English term alongside the L1 equivalent on the board and models pronunciation for choral repetition. Receptive recognition is the minimum expectation; active oral use is encouraged where prior knowledge allows.

Physics Concepts: force, resistance, fulcrum, load, mechanical advantage.

Technical Function Terms: reduce effort, transfer force, multiply distance.

Parts Terminology: axis, fulcrum, lever arm, effort arm, load arm.



These terms are introduced during the teacher explanation and the video in the main activities, not as pre-taught vocabulary in isolation. They are displayed on the classroom poster alongside the BICS vocabulary for passive reference throughout the lesson.

Language for Learning (BICS)

These phrases are the primary language target for active student production. They are introduced at the start of the lesson through modelling and choral repetition, displayed on the board for reference, and practised in context during the classification stations and the pair presentation activity.

Phrases for requesting and giving materials:

- 'Can you give me the lever label, please?' • 'Where is the ramp?' • 'Here is the screw.'

Classification and discussion phrases:

- 'Is this a lever or a pulley?' • 'I think it is an inclined plane.' • 'I agree / I disagree.' • 'I am not sure — let us check.'

Descriptive phrases of function (active structures):

- 'We use the [object] to [simple action]' (e.g., 'We use the ramp to lift heavy loads'; 'People use scissors to cut').

Instructions for a classmate:

- 'Put the label here.' • 'Find the bottle opener.' • 'Cut the card.'

Language Through Learning (not planned)

Expressions of Difficulty or Ease: Spontaneous phrases when handling objects (e.g., 'This is so easy!', 'It's really hard to move!', 'Shall we try again?').

Negotiating Meaning and Classification: Questions to a partner or teacher about the category or name of the object (e.g., 'This is a type of lever, right?', 'What is this object called in my language?').

Cause and Effect Language (Simple): Basic connections made when seeing the function (e.g., 'If I pull the rope, the box goes up', 'When I cut, the force is greater').

Identification of Unexpected Vocabulary: Names of unplanned tools or household items (e.g., screwdriver, nail clippers, clothesline).





LOTS — Remembering, Understanding, Applying

- What is the name of the machine that has a pivot point or fulcrum in the middle?
- Are scissors a lever or an inclined plane?
- What simple machine can you use to lift something very high?

HOTS — Analysing, Evaluating, Creating

- A bottle opener and a pair of scissors are both levers — what is different about the position of the fulcrum in each, and how does that difference affect the effort needed to use them? (Analysing)
- A construction company needs to move heavy materials to the top of a building. They can use a pulley system or a ramp. Which would you recommend and why? Consider effort, space and cost in your answer. (Evaluating)
- Design a simple device to help a person lift a heavy object using at least two of the three simple machines studied. Draw and label your design and explain how it reduces effort. (Creating)



GUIDING QUESTIONS FOR TEACHERS

Pre-lesson and in-lesson self-reflection:

- Have I displayed the three target terms (lever, pulley, inclined plane) with visual support before the warm-up, and have I planned the L1-to-L2 elicitation moment so students can activate prior conceptual knowledge before encountering the English vocabulary?
- Am I consistently modelling active sentence structures ('We use the ramp to...'; 'People use scissors to...') in my own explanations, and am I avoiding passive constructions that students are not expected to produce?
- Have I prepared for the possibility that students raise the wheel and axle as a fourth simple machine — do I know how to acknowledge it and redirect the discussion to the three categories studied without dismissing the observation?
- Are the image card sets at each station sufficiently different to prevent groups from copying previous classifications, and does each station have a language support card with sentence starters visible for pair discussion?
- Have I decided which format of the Alphabet Relay (left-side or across-the-middle) is appropriate for this group's level, and have I prepared the alphabet posters in advance?
- After the lesson, do the station classification sheets and the pair presentations provide sufficient evidence that students can correctly identify and categorise everyday objects into the three types of simple machine?





Technology at Home: Students are encouraged to identify examples of simple machines in their homes or daily lives, beyond the classroom (e.g., I use a bottle opener, my bicycle has wheels).

Simple Solutions: Students are asked to think of a simple problem that they solve with a simple machine and share it (e.g., using a ramp to load a heavy bag into a car boot).

Tools from Your Culture: Students are encouraged to identify traditional or specific tools from their culture of origin that are examples of simple machines (e.g., certain agricultural tools, kitchen utensils).

The History of Simplicity: Simple images are used to show how the same machines (the pulley, the inclined plane) were used in ancient civilisations (e.g., pyramids, ships) to do difficult work.

Universal Ingenuity: Promotes awareness that the need to make work easier is universal and that simple machines are an invention shared by all cultures.

Safety and Use: Discusses the importance of using simple tools and machines safely, promoting personal responsibility.

★ 21ST-CENTURY SKILLS

BICS-Related Skills

Communication: Students describe the function and classification of simple machines orally to their partner during the classification stations and to the class during the presentation, using the target vocabulary and sentence frames practised throughout the lesson.

Collaboration: Students work in groups at the classification stations, negotiating which category each object belongs to and dividing responsibilities. Cooperation phrases from the BICS section are used actively throughout.

Social & Cross-Cultural Skills: The Cultural Connection activity invites students to share examples of simple machines from their homes or cultural backgrounds, acknowledging the diversity of the classroom and the universality of human ingenuity.

Time Management: Students must complete the classification at each station within the time allocated before the rotation signal, and prepare

CALP-Related Skills

Critical Thinking: Students analyse the function of each object and match it to the correct simple machine category, applying conceptual knowledge rather than simple recall. The HOTS tasks extend this to comparison and evaluation of machine efficiency.

Problem-solving: The Classification Stations present genuine decisions: students must justify which category an object belongs to, resolve disagreements within the group and handle ambiguous cases (e.g., a knife as both lever and inclined plane).

Productivity & Accountability: Students are responsible for completing the classification sheets at all three stations and for the pair presentation. The self-assessment form requires each student to evaluate their own learning against specific, verifiable criteria.

Creativity (Academic): The HOTS Creating task asks students to design a simple device using at

their pair presentation within two to three minutes.

least two of the three machines studied, drawing, labelling and explaining their design — a genuine act of applied creativity.

METHODOLOGY

Duration	Lesson Flow	Activities	Materials Needed	AI Tools Integration
5'	Warm-up Activities	<p>Move Objects</p> <p>The teacher shows an everyday object (e.g., scissors, bottle opener, tweezers) and asks: 'What is this?' / 'What do we use it for?' / 'Do you know what it is called in your language?'</p> <p>Quick Search</p> <p>The teacher displays a large drawing or poster showing the three simple machines (lever, pulley, inclined plane) with no labels. Pointing to each machine in turn, the teacher asks: 'What is this? Do you know what it is called — in any language?'</p> <p>Students respond freely. Three scenarios are managed:</p> <ul style="list-style-type: none"> Students know the term in their L1 but not in English: the teacher accepts the L1 term, writes both side by side, and highlights similarities or differences (e.g., Spanish palanca / English lever; Spanish polea / English pulley). Students know the term in English: the teacher acknowledges it and invites the student to model pronunciation for the class. Students do not know the term in any language: the teacher provides the English term directly with a simple definition and visual, then 	<p>Real everyday objects (if possible) or large images.</p> <ul style="list-style-type: none"> Drawing of the three simple machines. 	<p>Audio Generator (TTS):</p> <p>Use a TTS tool to play the technical names of the machines (Lever, Pulley, Inclined Plane) clearly and several times, facilitating correct pronunciation.</p>



Duration	Lesson Flow	Activities	Materials Needed	AI Tools Integration
		<p>moves to pronunciation practice.</p> <p>Once all three terms are on the board, the teacher models pronunciation clearly. Students repeat chorally, then individually. The teacher draws attention to stress patterns (e.g., the stress on FUL-crum, the stress on IN-clined).</p>		
20'	Main Activities	<p>Classification Stations</p> <p>The class is divided into three groups. Each group begins at a different station (Lever, Pulley, Inclined Plane) and rotates on the teacher's signal. Rotation is teacher-assigned, not student-chosen.</p> <p>Each station contains:</p> <ul style="list-style-type: none"> • A set of image cards (different at each station) showing everyday objects to classify. • A large piece of card with the station name at the top, where students paste the images they agree belong to that category. • A language support card displaying sentence starters: 'I think this is a [machine] because...'; 'Do you agree?'; 'We use this to...'; 'I am not sure — let us check.' <p>Presentation of Use</p> <p>After the rotation, each group selects one object and prepares a short presentation in pairs (2–3 minutes preparation time). Students use the active sentence frame: '[Object] is a [simple machine] and we use it to [simple action]' (e.g., 'Scissors are a lever and we use them to cut'). The teacher redirects any passive responses to the active frame during feedback.</p>	<p>Three sets of image cards (one set per station, different objects at each).</p> <ul style="list-style-type: none"> • Three large pieces of card or poster paper, labelled with the machine name. • One language support card per station with sentence starters. • Glue. • Active sentence frame displayed on the board. 	<p>Grounded Image Search:</p> <p>If there is debate in a group, the AI search engine is used to show an example of a machine in action.</p>
15'	Wrap-Up & Sharing	<p>Alphabet Relay</p> <p>The class is divided into two or more teams. Each team has a large alphabet poster (letters listed vertically on the left, or</p>	<p>Classified objects.</p> <ul style="list-style-type: none"> • Blackboard. • Alphabet posters (one per team). 	—



Duration	Lesson Flow	Activities	Materials Needed	AI Tools Integration
		<p>arranged horizontally across the middle). On the teacher's signal, the first student writes one word related to the lesson (an object, a machine name, or an action verb). The marker passes to the next student for the next letter.</p> <ul style="list-style-type: none">• Left-side alphabet (easier): the word must start with the corresponding letter (e.g., L → lever, P → pulley, R → ramp).• Alphabet across the middle (more challenging): the word may contain the letter anywhere (e.g., the letter e could be matched with lever, inclined, plane). <p>The teacher selects the format based on the group's level. The activity ends when both teams have filled as many letters as possible or time runs out. A brief whole-class review follows, reading words aloud for pronunciation consolidation.</p> <p>Cultural Connection</p> <p>Students work in pairs for 2–3 minutes to prepare an example using the sentence frame: 'In my home / culture, we use [object]. It is a [simple machine] and we use it to [simple action].' Pairs then share with the class or with another pair. The teacher connects each example to the three categories studied.</p>		
5'	Evaluation & Feedback	<p>Teacher Assessment</p> <ul style="list-style-type: none">• Correct use of active classification structures (e.g., 'Scissors are a lever and we use them to cut').• Correct classification of objects into the three categories (lever, pulley, inclined plane), verified through the station classification sheets and the pair presentation. <p>Student Self-Assessment</p>	<p>Teacher observation sheet.</p> <ul style="list-style-type: none">• Self-assessment sheet with simple icons.	—



Duration	Lesson Flow	Activities	Materials Needed	AI Tools Integration
		<ul style="list-style-type: none">• I can name the three simple machines (lever, pulley, inclined plane).• I can classify scissors as a type of lever.• I can explain what a simple machine does using an active sentence (e.g., 'We use a pulley to lift heavy loads').• I can ask for and give materials to my partner using phrases from class.• I worked well in a team and we finished the classification.		

Co-Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the Foundation for the Development of the Education System (FRSE). Neither the European Union nor FRSE can be held responsible for them. *Project number: 2024-1-PL01-KA220-SCH-000256498*