

LESSON 6: A Problem–Solution Paragraph

Learning Goals: By the end of this lesson, you will be able to identify a problem and its causes, discuss possible engineering solutions, use linking expressions, and write a coherent problem–solution paragraph.

1. Engineering challenge: The energy problem

A town generates electricity using solar panels and wind turbines. However, electricity production decreases on cloudy days and when there is little wind. The town needs a reliable energy supply 24 hours a day.

- 1. What is the main problem?
- 2. What could happen if the problem is not solved?
- 3. What solutions would you recommend?

2. How is a problem–solution paragraph organised?

Part 1: The Problem	Part 2: The Solution
<ul style="list-style-type: none">• Identify the issue• Explain its causes• Describe its consequences	<ul style="list-style-type: none">• Introduce a possible solution• Explain how it works• Describe its expected benefits

3. Language toolkit

Introducing a problem	One major problem is... / A key challenge is...
Explaining causes	This is caused by... / This occurs because...
Describing consequences	As a result,... / This can lead to...
Proposing solutions	One possible solution is... / This problem could be addressed by...
Explaining benefits	This would reduce... / This could improve...
Concluding	In conclusion,... / Therefore,...

4. Reading: Battery innovations and renewable energy

One major challenge in adopting renewable energy is its inconsistency. Power availability is inconsistent because solar and wind energy are reliant on weather conditions, which can lead to fluctuations in energy supply. This issue needs a solution to maintain a stable energy supply, especially when conditions are not ideal. To address this, researchers at Columbia University have developed a new battery with an advanced electrolyte composition, enabling longer storage of renewable energy. This solution could avoid power shortages by retaining stored energy for use during low sunlight or weak wind conditions. Unlike current storage options, this battery operates through more charge cycles, dealing with the frequent need for replacements. Additionally, its improved energy density offers a solution to space constraints in storage facilities. The use of sustainable materials aids at solving the environmental impact of traditional batteries, making this option both efficient and eco-friendly. In conclusion, with widespread adoption, this technology could drastically reduce dependency on fossil fuels, providing a sustainable answer to energy instability issues.

<https://www.sciencedaily.com/releases/2024/09/240916153438.htm>

Reading task: Complete the chart with information from the text.

What is the main problem?
What causes the problem?
What are its consequences?
What solutions are proposed?
What benefits could these solutions provide?

5. Engineering problem–solution analysis

Match each problem with a possible solution from the reading. Then discuss the questions below.

Problem	Possible Solution
1. Inconsistent renewable energy supply	A. Use more sustainable materials
2. Frequent battery replacement	B. Improve energy density
3. Limited storage space	C. Develop batteries that last through more charge cycles
4. Environmental impact of battery materials	D. Improve energy storage

- ✓ Write the correct letter next to each problem: 1. ____ 2. ____ 3. ____ 4. ____
- ✓ Which solution addresses the most important problem? Why?
- ✓ Which solution could reduce maintenance costs?
- ✓ Which solution could have the greatest environmental benefit?
- ✓ What additional information would engineers need before implementing these solutions?

6. Put the Sentences in the Correct Order

Instructions: Number the sentences from 1 to 8 to create a coherent problem–solution paragraph.

Reducing Energy Waste in University Buildings

- This system could monitor electricity use and switch off equipment in empty rooms.
- As a result, electricity consumption increases, leading to higher costs and unnecessary environmental damage.
- One possible solution is to introduce an energy management system.
- This often occurs because lights, air conditioners and computers are left on when they are not needed.
- In conclusion, combining technology with changes in behaviour could make university buildings more energy-efficient and sustainable.
- In addition, installing energy-efficient lighting and improving insulation could reduce energy demand.
- Students and staff could also contribute by adopting more responsible energy-use habits.
- One major problem in university buildings is energy waste.

- ✓ Which linking expressions help you identify the logical order of the paragraph?