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Worksheet

This Worksheet is designed to guide educators on how the comic strips can be integrated into their classroom. Teachers can adjust based on student level and depth of discussion needed.

Topic N° 5 – Electronics and Automation

Lesson Duration: [Suggested number of sessions/days]

Lesson Plan

1 Pedagogical objectives [Suggested duration]

By the end of this activity, students will:

- Understand the basic functions of key electronic components: circuits, resistors, capacitors, and transistors.
- Explore real-world applications of these components in electronic systems.
- Encourage critical and creative thinking about how electronic components work together.
- Develop analytical skills by interpreting technological metaphors in a narrative format.
- Strengthen communication and collaboration through group discussion and reflection.

2 Introduction: What is Automation in Electronics? [Suggested duration]

Electronics is the science of controlling electric current to perform useful tasks. At its heart are tiny components – like resistors, capacitors, and transistors – that work together to make devices function.

Imagine this: You're watching a superhero movie, and the hero charges up their suit using a mysterious energy source. Behind the scenes, circuits made up of everyday components are doing just that – controlling energy, regulating power, and activating systems.

In this comic strip, we dive into the origin story of these "super components" – each with a unique power that, when united, helps bring technology to life!



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3 Explore the Storyline [Suggested duration]

Teacher's Role: Present the comic strip and guide the discussion.

Student Task: Read the comic strip and analyse:

- What is happening in the story?
- How do the characters (components) interact with each other?
- What roles do the resistor, capacitor, and transistor play in solving problems or facing challenges?
- How does the story reflect real-life principles of electronics?

Discussion: The teacher and students analyse the scientific/technological principles in the comic.

Topics for discussion might include:

- The function of each component in a circuit (e.g. resistors limit current, capacitors store energy, transistors act as switches).
- How these components interact in real electronic devices.
- The metaphorical representation of collaboration and system design through the superhero team.
- Connections between the storyline and real-world electronics applications (e.g. smartphones, computers, robotics).

Activities

- **Activity 1: Observation and Reflection [Suggested duration]**

Objective: Help students recognize key concepts visually.

Instructions: Observe the following images and identify which ones are related to electronics and its core components. Justify your choices.

Materials: Use or display images such as:

- A printed circuit board (PCB)
- A resistor
- A battery
- A transistor
- A banana
- A capacitor
- A toy robot
- A magnet



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Discussion Questions:

- How do these images relate to electronics?
- What common patterns do you notice among the selected items? (e.g., "They all involve the control or flow of electrical energy.")

- **Activity 2: Combine the Elements [Suggested duration]**

Objective: Reinforce understanding by linking concepts with definitions.

Instructions: Links each concept to its corresponding definition.

Concept	Definition
Resistor	Limits or regulates the flow of electric current in a circuit.
Capacitor	Stores electrical energy temporarily and releases it when needed.
Transistor	Acts as a switch or amplifier to control the flow of electricity.
Circuit	A complete and closed path through which electric current can flow.
Power Source	Provides the electrical energy needed for the circuit to function.

- **Activity 3: Reflective questions**
- **Activity 3.1. Mini-challenge: Creation and Imagination [Suggested duration]**

Objective: Encourage students to think creatively and apply their knowledge.

Instructions: Imagine you are an expert in electronics. Propose an invention, scenario or solution related to this topic.

- Describe your idea in a few sentences.
- Make a diagram or a short comic strip explaining how it works.

Example: "I invented a smart wristband that uses a temperature sensor and a transistor-based circuit to alert you when you have a fever. It's powered by a tiny battery and uses a capacitor to manage quick power bursts for notifications."



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Activity 3.2. Group or pair discussions [Suggested duration]

- What do you think about the impact of electronics on our daily lives?
- What advantages and disadvantages can you identify? (Encourage discussion on topics like convenience, sustainability, overreliance on technology, etc.)
- What did you learn about the function of each electronic component?
- If you were one of the components in the superhero story, which one would you be and why?
- Can you think of a real-life object that uses these components?

Conclusion and Review

Quick summary: Summarize the 3 most important points about the topic.

Example:

- Electronic components like resistors, capacitors, and transistors are the building blocks of all modern technology.
- These components work together in circuits to control the flow, storage, and amplification of electrical energy.
- Understanding how they function helps us design smarter, more efficient systems — from smartphones to robots.

Final Quiz: Answer the following questions in one sentence.

1. What is electronics in one sentence?
Example: Electronics is the field of science and technology that deals with controlling electric current using various components to perform specific tasks.
2. Give an example of a concrete application.
Example: A smartphone uses electronic circuits made of transistors, resistors, and capacitors to process information and connect to the internet.
3. What do you think will be the future of electronics?
Example: Electronics will continue to evolve with smarter, smaller, and more energy-efficient components powering everything from wearable health monitors to intelligent machines.

Remember: Understanding electronics is essential because it powers the tools, systems, and innovations that shape the world we live in – and the future we're building.