


# EDUCATOR GUIDE

## TARGET AUDIENCE

Ages 10 -17 – Upper elementary to high school students

## OVERVIEW

Cloud Community is a Minecraft Education experience that introduces students to modern, AI-ready datacenters through hands-on, scenario-based missions focused on sustainability and cybersecurity.

Inside a virtual datacenter, students construct eco-friendly facilities, manage cooling and energy demands, and respond to cybersecurity threats, with each activity linking gameplay to real-world STEM concepts and Microsoft's sustainability and security initiatives. A nearby Minecraft village represents the community that depends on the datacenter, allowing students to see the direct impact of their decisions as they work to keep the town powered, connected, and secure.

## ESSENTIAL QUESTION

"How can technology leaders design and operate Datacenters that balance environmental sustainability with robust cybersecurity in an AI-driven world?"

## MATERIALS NEEDED

- Computers with Minecraft Education installed
- Cloud Community

## LESSON DURATION

1 Class Period (45-60 minutes)

## LEARNING OBJECTIVES

Students will:

- Explain how AI-ready datacenters are built and why they matter
- Identify advanced datacenter technologies
- Recognize sustainable energy challenges & solutions
- Understand cybersecurity operations (SOC) in a datacenter
- Explore tech career pathways

## KEY VOCABULARY

**Edge node**: a device or server located close to where data is generated, processing information locally instead of sending it to a central system.

**Latency**: the delay between a request being made and the response being received.

**Cyberspace**: the virtual environment created by interconnected digital networks where online communication and data exchange occur.

**Edge computing**: a computing approach that processes data near its source to reduce latency and bandwidth use.

**Cybersecurity**: the practice of protecting systems, networks, and data from digital attacks or unauthorised access.

**SOC (Security Operations Centre)**: a centralised team or facility that continuously monitors, detects, and responds to cybersecurity threats.

**Sustainability**: the practice of meeting present needs in ways that protect resources, environments, and wellbeing so future generations can meet their own needs.

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# Introduction

Cloud Community offers educators an innovative platform to engage students in real-world challenges by seamlessly blending sustainability and cybersecurity concepts into its gameplay and story. Designed in alignment with Microsoft's core focus areas, the game introduces students to environmentally responsible technology practices, such as using low-carbon building materials, deploying renewable energy sources, and exploring advanced cooling solutions, through interactive missions that highlight positive advancements in Datacenter operations. Simultaneously, Cloud Community brings digital security to life through a simulated Security Operations Center (SOC) mission, allowing learners to step into the role of a SOC analyst responding to cyber threats, honing skills like pattern recognition, critical thinking, and teamwork in a student-friendly environment. This educator guide provides the resources and structure needed to help integrate Cloud Community into the classroom, empowering students to understand and navigate the intersection of sustainability and cybersecurity while sparking interest in future technology careers.



# LESSON OVERVIEW

| | |
|---|---|
| **Lesson Goal** | Students will gain an understanding of how AI cloud services operate by exploring the construction and sustainability of datacenters, identifying advanced technologies and energy solutions, participating in cybersecurity operations, and discovering diverse technology career pathways through interactive problem-solving in Cloud Community. |
| **Core Concepts** | • **Sustainable AI Infrastructure:** Modern Datacenters must be designed and built using environmentally responsible materials and systems to support the growing demands of artificial intelligence.<br>• **Energy Systems & Environmental Trade-offs:** Balancing renewable energy sources, backup power, and fluctuating demand requires strategic decision-making to minimise environmental impact while maintaining performance.<br>• **Edge Computing & Network Efficiency:** Placing computing power closer to where data is generated reduces latency, improves speed, and increases the reliability of digital services. |

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| | |
|---|---|
| | • **Cybersecurity & Human–AI Collaboration:** Effective Datacenter security relies on both artificial intelligence and skilled professionals working together to detect, classify, and respond to cyber threats.<br><br>**Technology's Societal Impact & Career Pathways:** Datacenters play a critical role in supporting communities and create diverse career opportunities across engineering, sustainability, cybersecurity, and AI. |
| **Lesson Structure** | The learning experience is divided into five engaging activities.<br><br>1. If We Build It .....<br>2. Stay Cool<br>3. Cartside Computing<br>4. Power Up!<br>5. SecOps |
| **Teaching Flow** | 1. Pre-Lesson Setup<br><br>2. Lesson Delivery<br><br>3. Post-Lesson Reflection |

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## CURRICULUM CONNECTIONS

| | |
|---|---|
| **CSTA Standards (2026)** | **3A-IC-27** Use tools and methods for collaboration on a project to increase connectivity of people in diverse cultures and career fields.<br><br>**1B-NI-05**<br><br>Discuss real-world cybersecurity problems and how personal information can be protected.<br><br>**2-NI-05** Explain how physical and digital security measures protect electronic information.<br><br>**3A-NI-05**<br><br>Give examples to illustrate how sensitive data can be affected by malware and other attacks. |

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| | |
|---|---|
| | **3A-NI-06**<br><br>Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical impacts.<br><br>**3A-NI-07**<br><br>Compare various security measures, considering tradeoffs between the usability and security of a computing system**.** |
| **ISTE** | **1.2 Digital Citizen -** Students recognize the responsibilities and opportunities for positively contributing to their digital communities.<br><br>**1.3 Knowledge Constructor -** Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.<br><br>**1.5 Computational Thinker -** Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. |
| **AI4K12** | **Big Idea 5:** Societal Impact of AI<br><br>**Big Idea 3:** Learning (Machine Learning Systems)<br><br>**Big Idea 2:** Representation & Reasoning |

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# PREPARING

## Getting Started – Minecraft Education

Minecraft Education offers a unique learning platform where students can engage in creative builds and various game elements.

Here's how to get setup:

1. Go to Download | Minecraft Education to download and install Minecraft Education.

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2. If you do not have a valid O365 EDU account, you can still try a free demo on Windows, Mac or iPad.
3. Review the lesson plan and resources to begin.

Once you are set-up with Minecraft Education, you should:

- Use this Educator Guide, Lesson Plan, and Classroom Presentation to help you prepare for your Cloud Community experience.
- Play through the Cloud Community game to get more familiar with the gameplay!

# PRE-LESSON ACTIVITIES

## Setting The Scene

Play Cloud Community – Introduction video for students

Explain to the students that they will have the opportunity to explore how AI cloud services operate. They will face a series of activities to assist in the construction and complete problem-solving tasks related to a Microsoft Datacenter.

## Essential Question and Theme

“How can technology leaders design and operate Datacenters that balance environmental sustainability with robust cybersecurity in an AI-driven world?”

## Activity Discussion

Referring to slides 2–9 in the educator PowerPoint, introduce students to the topic and complete the pre-lesson activity. Note that instructions and scripts are located in the notes section of the PowerPoint. Print slide six as required.

# STUDENT TUTORIAL

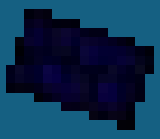
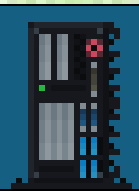
## Beginning Game Play

The game will start with the players standing in a classroom. As they approach the teacher, an animation will play. After speaking with the teacher, the player is teleported home.



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## Essential Tools

| Name | Description | Image |
|---|---|---|
| Home | Used to return to the house |  |
| Wrench | Used to turn the water pipes |  |
| Solar Panel | Used to generate solar power |  |
| Turbine | Used to generate wind energy |  |
| Hydrogen | Used to purchase additional hydrogen |  |
| Edge Node | Used to power edge computer |  |

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# ACTIVITY 1 – If WE BUILD IT...

In this activity, players help build the facility and learn about sustainable materials. NPCs also explain how the datacenter benefits nearby villages.

The construction activity itself involves:

1. Please take a moment to talk to the Retired Grandparent; they will provide instructions throughout this activity.



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2 Collect the items from the chest next to the construction worker, then collect the cobblestone, sand, gravel and water from the quarry.



3 Then place the correct items into the cement mixer.



4 Drive the cement mixer truck to the construction site. Exit the truck and speak with the NPC



5 Return to the truck and pour the concrete into the designated section. Select to pour when the target changes from red to green.



6 Use the crane to move recycled steel beams from piles to their designated positions at the construction site. The transparent yellow beams will change when the metal beams pass through them.



**Key Takeaway:** The rising demand for artificial intelligence necessitates the construction of new datacenters. Incorporating sustainable materials, such as locally sourced cement and recycled steel beams can help minimize the environmental footprint of these facilities.

## ACTIVITY 2 – STAY COOL

In this activity, the player must solve a short series of pipe puzzles in order to connect server racks to chilling units and cooling towers.

Completing the puzzle involves using the wrench tool to hit preplaced pipes. Hitting the pipes will turn them 90 degrees. Connecting all the pipes to form an unbroken chain between the servers, chillers, and cooling towers completes the activity.

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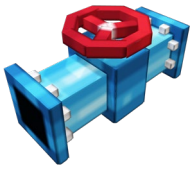
1. Please take a moment to talk to a Trusted Adult; from there, you will speak with the project manager, who will explain more about the water cooling system. He will need your help to fix it.



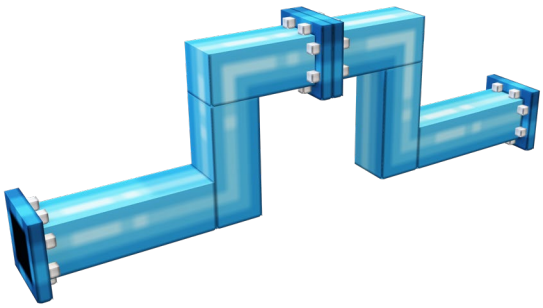
2. After the animation, use the wrench from the project manager to rotate the yellow pipes until no connections remain open.



3. When the combination is correct, the water valve will open, and all the pipes will turn blue.



**Key Takeaway:** Datacenters cool servers for efficiency and protection; water cooling is one option.





## ACTIVITY 3 – Cartside Computing

In this activity, students move away from the datacenter setting and into a diamond mine environment. An AI Agent is controlling minecarts full of diamonds travelling through a cave with lava hazards. The AI Agent pauses to process decisions (as shown in animations), but latency causes delays—some minecarts fall into the lava and are destroyed. An NPC explains the problem and suggests that students “travel through cyberspace” to understand why the signal is slow.

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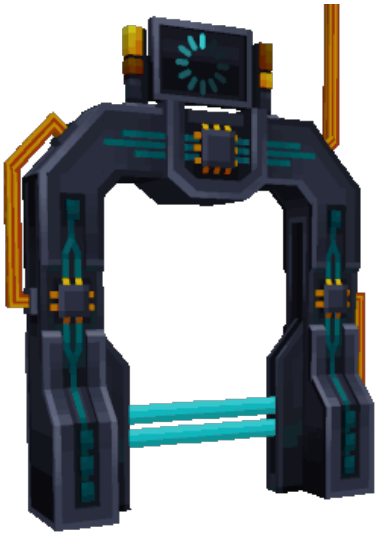
| | |
|---|---|
| 1 | After talking to Older Brother, the Engineer will explain the next task. |
| 2 | Listen to the Engineer explain the concept of Edge Computing by watching the animation of the agent and the diamonds. |
| 3 | Race on a cyberbike along a long course to reach the datacenter to see how long it takes you to travel.<br><br>There are obstacles to dodge, and different surfaces allow the cyberbike to travel more slowly or faster. |
| 4 | After that, you'll be asked to fix the edge node, which will fix the connection. |
| 5 | Travel again on the cyberbike and observe how the path differs. |
| 6 | Once completed, watch how the agents' response time has improved. |







**Key Takeaway:** Edge computing places computing closer to the end user, reducing lag.



## ACTIVITY 4 – Power Up!

This activity focuses on how datacenters meet their energy needs using sustainable power sources. Students will learn why renewable energy is critical for reducing a datacenter's carbon footprint by building renewable energy sources to power the datacenters as it's demand increases.

The three power sources explored in this activity include

| Solar | Wind | Hydrogen |
|---|---|---|

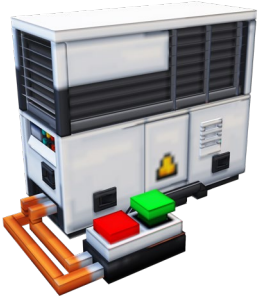
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Energy is generated by converting sunlight into electricity or heat using solar thermal systems.



Energy is produced by harnessing the kinetic power of moving air through wind turbines to generate electricity.

Energy obtained by using hydrogen as a fuel, releasing power through combustion or electrochemical reactions, such as fuel cells, with water as the primary by-product



**1**

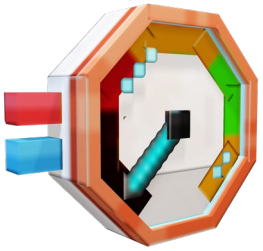
After talking to Trusted Adult, the Engineer will explain the importance of sustainable energy and its role in minimizing environmental impact. You must manage the rising energy demands of a virtual datacenter by building renewable power generators.



**2**

You will receive three plots at a time to construct wind or solar generators.
When building on the plots, you will need to consider two factors:

1. The weather forecast from the Engineer
2. How much money do you have to build?



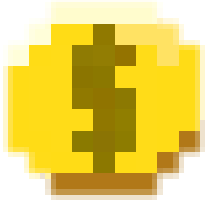
**3**

When you're done, test the energy demand and watch to see if you stay within the green energy zone.
Energy demand can be balanced by using hydrogen generated on days when solar or wind power is unavailable.



**4**

If you are successful, an additional three plots will open for you to place more solar or wind generators.



**5**

Remember to check how much money you have to spend so you can ensure that each plot is filled.

**6**

The activity ends if too much time is spent outside the green zone or if power is maintained for the required duration.

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**IMPORTANT**

**Weather Impact:**

Students will need to learn to balance energy sources by combining wind and solar rather than relying on a single source.

- Weather events affect generation:
    - Overcast days reduce solar output.
    - Still air reduces wind output.

**Challenge:**

- Once all plots are filled, **demand spikes** push energy needs beyond the base load.
- Students must run to a **hydrogen generator** and activate it for temporary backup power. Hydrogen fuel is limited, so students need to manage its use strategically.

**Key Takeaway:** Datacenters use sustainable energy to manage power consumption and reduce environmental impact.



# ACTIVITY 5 – SecOps

This activity introduces students to the role of cybersecurity in protecting datacenters and the communities they serve. It begins with a short tour of the SOC environment.

1. After talking to Older Sister, talk to the team leader. This NPC will explain how AI and machine learning help classify incoming signals and alert analysts to potential threats.



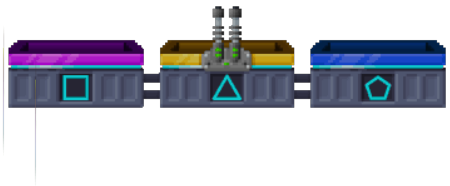
2. Students play a game modelled on a “Space Invaders” style interface. Threats move from the top to the bottom of a large screen representing the SOC monitoring system.

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3

Students are equipped with:

- An **ID device** to identify threats.
- A set of **threat response catchers** for handling specific threat types.



4

When students hit a potential threat with the ID device:

- **False positives** turn **green** and can be ignored.
- **True positives** turn blue, pink and yellow and change shape to represent a specific threat type.



5

Students then use the correct catcher to neutralise each true positive by aligning it and capturing it in the corresponding treat-response catcher.

**Challenge Progression:**

- The first attempt is overwhelming because the AI filter is turned off.
- An NPC activates the AI filter, showing how AI assists in managing large volumes of alerts.

During the timed activity, students earn points for accurately sorting threats, lose points for missed threats, and may replay the challenge to achieve a higher score.

**Key Takeaway:** SecOps protects the datacenter and the community that uses it from cyber threats.



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# LESSON REVIEW

## Completion of the Activities

When students complete the final activity, they will be teleported back to their room, where they are asked to write their final paper for school. They are then teleported back to their classroom, where the teacher congratulates them on their hard work. Students can then access their certificate for successfully completing all the tasks.

## Reflection Questions

- What was your favourite activity?
- Name one way datacenters help society.
- Why are datacenters important for the growing demand for AI?
- What type of career opportunities do datacenters offer?
- How can datacenters reduce their impact on the environment?

# LEARNING CHECK – Years 4 -6

Name: _____ Date: _____

**Part A: Vocabulary Match**

Draw a line to match each word to its meaning.

| | | | |
|---|---|---|---|
| Edge Computing | ○ | ○ | Protecting computers and data from hackers |
| Cybersecurity | ○ | ○ | Using resources carefully so future generations are protected |
| Sustainability | ○ | ○ | A team that monitors and responds to cyber threats |
| Latency | ○ | ○ | A delay between sending and receiving information |
| SOC | ○ | ○ | Processing data closer to where it is created |

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**Part B: If We Build It... (Sustainability)**

1. Why do we need new datacenters?

---

2. Name TWO sustainable materials used in the construction activity:

- _____
- _____

3. Why is it important to use recycled or low-carbon materials?

---

---

**Part C: Stay Cool (Cooling Systems)**

1. Why do servers need cooling?

☐ To make them look better
☐ To stop them from overheating
☐ To save internet data

2. What happened when you connected the pipes correctly?

---

**Part D: Cartside Computing (Edge Computing)**

1. What problem was happening with the minecarts?

---

2. What caused the delay?

☐ Too many diamonds
☐ High latency
☐ Broken tracks

3. How did adding an edge node fix the problem?

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**Part E: Power Up! (Renewable Energy)**

Circle the renewable energy sources used:

| Coal | Solar | Wind | Oil | Hydrogen |
|---|---|---|---|---|

1. Why shouldn't we rely on only one energy source?

2. What happened when energy stayed "in the green"?

**Part F: SecOps (Cybersecurity)**

1. What is the job of a SOC team?

2. What is a "true positive" threat?

3. How did AI help during the activity?

**Reflection**

1. One thing I learned about datacenters:

2. One way datacenters help communities:

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# LEARNING CHECK – Years 7 -10

Name: _____ Date: _____

**Section A: Short Response (Concept Understanding)**

1. Explain why AI growth increases the need for new datacenters.

---

2. Describe two environmental trade-offs datacenters must manage.

---

3. Compare renewable energy and hydrogen backup power.
   When is hydrogen most useful?

---

**Section B: Systems Thinking – Cooling & Efficiency**

In Activity 2, students connected water cooling systems.

1. Explain how cooling systems improve performance and protect infrastructure.

---

2. What might happen if cooling systems fail in a real-world datacenter?

Provide at least two consequences.

- _____

- _____

**Section C: Edge Computing & Latency**

1. Define latency in your own words.

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2. Using the minecart example, explain how edge computing reduces latency.

---

3. Identify one real-world application where edge computing is essential and justify your reasoning.

---

**Section D: Cybersecurity & Human–AI Collaboration**

1. Why was the SecOps challenge overwhelming without AI filtering?

---

2. Explain how AI and human analysts work together in a SOC.

---

**Section E: Scenario-Based Problem Solving**

**Scenario:**
A datacenter experiences:

- A sudden spike in AI demand
- Overcast weather
- Low wind
- Increased cyber threats

Using knowledge from Cloud Community, explain how you would:

1. Maintain power stability
2. Protect the system from cyber threats
3. Reduce environmental impact

Provide a structured response (minimum 8–10 sentences).

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**Section F: Career Pathways Reflection**

Identify two careers connected to datacenters (e.g., sustainability engineer, cybersecurity analyst, AI engineer).

For each career:

- Describe the role
- Identify one key skill required
- Explain why the role is important

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# ANSWER KEY – Worksheet (Y4-6)

**Part A: Vocabulary Match**

Edge computing = processing data closer to where it is created
Cybersecurity = protecting systems and data from attacks
Sustainability = using resources carefully for the future
Latency = delay between request and response
SOC = team that monitors/responds to threats

---

**Part B: If We Build It... (Sustainability)**

1. **Why do we need new datacenters?**
   Because AI and internet services are growing, and more computing power is needed to store and process data.
2. **Two sustainable materials:**

- Recycled steel beams
- Locally sourced / low-carbon cement

3. **Why use recycled/low-carbon materials?**
   To reduce pollution, lower carbon emissions, and protect the environment.

---

**Part C: Stay Cool (Cooling Systems)**

1. ✓ To stop them from overheating
2. When pipes were connected correctly, the water valve opened and the pipes turned blue.

---

**Part D: Cartside Computing (Edge Computing)**

1. Minecarts were falling into lava because the AI decision was delayed.
2. ✓ High latency
3. Adding an edge node reduced the distance data had to travel, making decisions faster and preventing delays.

---

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**Part E: Power Up! (Renewable Energy)**

Circle: Solar, Wind, Hydrogen

1. We shouldn't rely on one source because weather affects solar and wind. If one fails, another can help.
2. The score increased and the datacenter stayed powered.

---

**Part F: SecOps (Cybersecurity)**

1. The SOC team monitors threats and protects the datacenter from cyberattacks.
2. A true positive is a real cyber threat that must be stopped.
3. AI helped by filtering and sorting threats so humans could focus on real dangers.

---

**Reflection (Sample Strong Responses)**

• Datacenters power AI, websites, and online services.
• They help communities by keeping hospitals, schools, and businesses connected.

---

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# ANSWER KEY – Worksheet (Y7-10)

**Section A: Concept Understanding**

1. **Why AI increases need for datacenters:**
   AI systems require large amounts of data processing and storage. As AI use increases globally, more infrastructure is needed to handle computation, storage, and real-time services.
2. **Two environmental trade-offs:**

- High energy consumption vs. sustainability goals
- Cooling efficiency vs. water usage
- Reliability (backup systems) vs. carbon emissions

3. **Renewable vs. Hydrogen:**
   Renewables (solar/wind) provide clean ongoing energy but depend on weather. Hydrogen acts as backup power when renewables cannot meet demand, ensuring reliability.

---

**Section B: Cooling & Efficiency**

1. Cooling prevents overheating, maintains performance, extends hardware lifespan, and reduces system failures.
2. If cooling fails:

- Servers overheat and shut down
- Data loss or service outages
- Hardware damage
- Fire risk in extreme cases

---

**Section C: Edge Computing & Latency**

1. Latency is the time delay between sending data and receiving a response.
2. In the minecart example, decisions were slow because data traveled too far. Adding an edge node moved processing closer, reducing travel time and preventing failure.
3. Real-world applications (acceptable examples):

- Self-driving cars (need instant decisions)

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- Online gaming
- Remote surgery
- Smart traffic systems
  Justification should explain need for low delay.

---

**Section D: Cybersecurity & Human–AI Collaboration**

1. Without AI filtering, too many alerts overwhelmed the analyst, making it hard to identify real threats.
2. AI detects patterns and filters alerts; humans make complex decisions, interpret context, and respond strategically.

---

**Section E: Scenario-Based Problem Solving**

(Example of a High-Quality 8–10 Sentence Response)

To maintain power stability, I would balance wind and solar energy and activate hydrogen backup during peak demand. Since weather conditions reduce renewable output, hydrogen provides temporary support. I would also monitor energy levels carefully to keep them in the green zone. To protect the system from cyber threats, I would activate AI filtering in the SOC to manage alerts efficiently. Human analysts would focus on true positives and respond quickly. To reduce environmental impact, I would prioritize renewable energy over fossil fuels and use hydrogen only when necessary. Sustainable materials and efficient cooling systems would further reduce emissions. Combining energy management and cybersecurity ensures the datacenter remains reliable and environmentally responsible.

(Assess for: use of sustainability, energy balancing, cybersecurity, AI collaboration concepts.)

---

**Section F: Career Pathways**

Example responses:

**1. Sustainability Engineer**
Role: Designs energy-efficient systems for datacenters
Skill: Environmental systems analysis
Importance: Reduces carbon footprint

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**2. Cybersecurity Analyst**
Role: Monitors and responds to cyber threats
Skill: Threat detection and critical thinking
Importance: Protects data and infrastructure

Other acceptable careers:

- Datacenter Engineer
- AI Engineer
- Network Engineer
- Cloud Architect
- SOC Analyst

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