SECOND TERM
WEEKLY LESSON NOTES – B8
WEEK 9

Week Ending: 02-06-2023	**DAY:**	**Subject:** Computing	
Duration: 60mins		**Strand:** Communication Networks	
Class: B8	**Class Size:**	**Sub Strand:** Computer Networks	
Content Standard: B8.3.1.1. Identify the concept of computer networking for global communication	**Indicator:** B8.3.1.1.1 Describe the data communication models for networks.		**Lesson:** 1 of 2
Performance Indicator: Learners can describe the data communication models for networks		**Core Competencies:** CC8.2: CP6.1	
Reference: Computing Curriculum Pg. 32			

Activities For Learning & Assessment	**Resources**	**Progression**
Starter (5mins) Revise with learners to review their understanding in the previous lesson. Share performance indicators and introduce the lesson. ***Main (35mins)*** Brainstorm learners to explain data communication models. *Data communication models refer to the conceptual frameworks that describe how data is transmitted and received between communication entities*. Engage learners to give some examples of data communication models. *1. Simplex Model* *2. Half-Duplex Model* *3. Full-Duplex Model* *4. Simplex Stop-and-Wait Model* *5. Pipelining Model* *6. OSI Model* Guide learners to explain the Open System Interconnection (OSI) model. *The Open System Interconnection (OSI) model is a conceptual framework that standardizes the functions of a communication system into seven different layers. Each layer in the OSI model has specific tasks and responsibilities, and they work together to facilitate communication between devices and networks*. Learners to Identify the different layers in the OSI model. *1. Physical Layer: The Physical layer is the lowest layer of the OSI model. It deals with the physical transmission of data, including the electrical, mechanical, and procedural aspects of communication. It defines the physical characteristics of the network, such as cables, connectors, and signaling.*	Pictures and videos	Describing the data communication models for networks

2. Data Link Layer: The Data Link layer provides a reliable and error-free transfer of data between adjacent network nodes. It handles the framing of data into frames, error detection and correction, flow control, and access to the physical medium. *3. Network Layer: The Network layer is responsible for addressing, routing, and forwarding data packets across different networks. It determines the best path for data transmission, handles logical addressing, and manages network congestion.* *4. Transport Layer: The Transport layer ensures reliable delivery of data between end-to-end connections. It breaks down data into smaller segments, manages data sequencing, and provides error detection and recovery mechanisms.* *5. Session Layer: The Session layer establishes, manages, and terminates sessions between communicating devices. It allows for synchronization, checkpointing, and recovery of data in case of failures.* *6. Presentation Layer: The Presentation layer is responsible for data representation, encryption, compression, and formatting. It ensures that data from different systems can be understood by the receiving system.* *7. Application Layer: The Application layer is the highest layer in the OSI model. It provides services directly to the end-user applications. It includes protocols for tasks such as file transfer, email, web browsing, and remote access.* <u>Assessment</u> Fill in the blanks with the appropriate layer of the OSI model. 1. The _____ layer is responsible for addressing and routing data packets across different networks. 2. The _____ layer ensures reliable delivery of data between end-to-end connections. 3. The _____ layer provides a reliable and error-free transfer of data between adjacent network nodes. 4. The _____ layer handles the framing of data into frames, error detection and correction, and flow control. 5. The _____ layer establishes, manages, and terminates sessions between communicating devices. 6. The _____ layer is responsible for data representation, encryption, compression, and formatting. 7. The _____ layer is the lowest layer of the OSI model, dealing with the physical transmission of data. 8. The _____ layer provides services directly to end-user applications. 9. The _____ layer allows for synchronization, checkpointing, and recovery of data in case of failures.		

10. The _____ layer handles the physical characteristics of the network, such as cables and connectors. 11. The _____ layer is responsible for breaking down data into smaller segments, managing data sequencing, and providing error detection and recovery. 12. The _____ layer includes protocols for tasks such as file transfer, email, web browsing, and remote access. ***Reflection** (10mins)* Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson. Take feedback from learners and summarize the lesson.		

Homework/Project Work/Community Engagement Suggestions

- What is the purpose of the OSI model?
- Why is it important to divide the communication process into layers?
- How does the OSI model help troubleshoot network issues?
- Give an example of a protocol that operates at each layer of the OSI model.
- Describe a real-world scenario where the OSI model is used in networking.

Cross-Curriculum Links/Cross-Cutting Issues

None

Potential Misconceptions/Student Learning Difficulties

None

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Performance Indicator: Learners can describe the data communication models for networks		**Core Competencies:** CC8.2: CP6.1	
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Activities For Learning & Assessment	**Resources**	**Progression**
Starter (5mins) Revise with learners to review their understanding in the previous lesson. Share performance indicators and introduce the lesson. ***Main (35mins)*** Discuss the purpose or benefits of the layers in ensuring interoperability of different hardware devices. *1. Modularity: The layered approach allows for modularity in design. Each layer has a specific set of functions and responsibilities, which can be developed and implemented independently. This modularity simplifies the design process and enables the use of different hardware devices from multiple vendors.* *2. Interoperability: The layers ensure interoperability between different hardware devices by providing standardized interfaces and protocols. Each layer communicates with the corresponding layer in another device using well-defined protocols, enabling devices from different manufacturers to communicate seamlessly.* *3. Abstraction: The layers provide a level of abstraction, hiding the complexities of lower layers from the higher layers. Each layer can focus on its specific tasks without needing to understand the intricacies of other layers. This abstraction simplifies development and maintenance and allows for easier upgrades or replacements of specific layers without affecting the overall system.* *4. Flexibility: The layered approach allows for flexibility in adapting to changing technologies and requirements. As long as the interfaces and protocols between layers remain consistent, new hardware devices can be introduced or existing devices can be upgraded without affecting the compatibility with other devices. This flexibility promotes innovation and scalability in communication systems.* *5. Troubleshooting and Maintenance: The layered structure simplifies troubleshooting and maintenance. If an issue occurs, it can be localized to a*	Pictures and videos	Discussing the purpose or benefits of the layers in ensuring interoperability of different hardware devices

specific layer, making it easier to identify and resolve the problem. Network administrators can focus on the affected layer without disrupting the functionality of other layers.

6. Standardization: The layers facilitate standardization of protocols and interfaces, ensuring compatibility and interoperability among different hardware devices. Standards are crucial for creating a common language for communication, allowing devices from various manufacturers to work together seamlessly.

Assessment

Fill in the blanks with the appropriate terms related to the benefits of layered communication in ensuring interoperability of different hardware devices.

1. The _____ approach in communication allows for modularity and independent development of each layer.

2. _____ refers to the seamless communication between devices from different manufacturers.

3. Layers provide a level of _____, hiding the complexities of lower layers from the higher ones.

4. The layered structure enables flexibility in adapting to _____ technologies and requirements.

5. _____ simplifies troubleshooting by localizing issues to specific layers.

6. _____ of protocols and interfaces promotes compatibility and interoperability.

Reflection (10mins)

Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.

Take feedback from learners and summarize the lesson.

Homework/Project Work/Community Engagement Suggestions

- Why is modularity important in the design of communication systems?
- How does interoperability benefit users in a networked environment?
- Explain the concept of abstraction in the context of layered communication.
- Give an example of how the layered approach allows for flexibility in a communication system.
- Why is standardization crucial for ensuring compatibility among different hardware devices?
- How does the layered structure simplify troubleshooting and maintenance?

Cross-Curriculum Links/Cross-Cutting Issues

None

Potential Misconceptions/Student Learning Difficulties

None