Lesson 11: OSI Model

In this lesson, students will learn about the seven-layer Open Systems Interconnection (OSI) model and its importance in computer networking. They will be introduced to each layer of the OSI model and understand their specific purposes. Through activities and independent research, students will match networking protocols to the appropriate layer, engage in role play to demonstrate the functions of each layer, and summarize their findings in a brief presentation. The lesson will conclude with an exit ticket to assess students' understanding of the OSI model and its layers.

## **Objectives:**

By the end of this lesson, students will be able to:

- Describe the purpose of each layer in the seven-layer Open Systems Interconnection (OSI) model.

- Describe the use of contemporary networking protocols in the seven-layer OSI model.

## **Materials:**

- Slides or presentation on the OSI model

- Activity sheets related to the content covered in the slides

- Whiteboard or blackboard

- Markers or chalk

- Exit tickets

## **Bell-Ringer Activity (5 minutes):**

- Display a diagram of the TCP/IP model on the board.

- Ask students to recall the layers of the TCP/IP model that were covered in the previous lesson.

- Discuss briefly with the students the purpose of each layer in the TCP/IP model.

## **Introduction (10 minutes):**

- Introduce the OSI model as a conceptual model for understanding how network protocols work together.

- Explain that the OSI model consists of seven layers, each with its own specific purpose.

- Discuss the importance of understanding the OSI model in the field of computer networking.

## **Direct Instruction (20 minutes):**

- Present the seven layers of the OSI model one by one, providing a brief description and the purpose of each layer:

1. Physical Layer: Transmits raw bit streams over physical media.

2. Data Link Layer: Provides error-free transmission of data frames between nodes over a physical link.

3. Network Layer: Manages the addressing and routing of data packets across multiple networks.

4. Transport Layer: Provides reliable and transparent transfer of data between end systems.

5. Session Layer: Establishes, manages, and terminates connections between applications.

6. Presentation Layer: Translates, encrypts, and compresses data for transmission.

7. Application Layer: Provides network services to end-user applications.

- Relate each layer to the corresponding layer in the TCP/IP model discussed in the previous lesson.

## **Guided Practice (25 minutes):**

- Distribute activity sheets to the students.

- Instruct the students to complete the activity sheet by matching the descriptions of networking protocols to the appropriate layer of the OSI model.

- Circulate the classroom to provide assistance and answer any questions.

## **Independent Practice (20 minutes):**

- Assign a short research task to the students.

- Instruct them to choose one layer of the OSI model and research a contemporary networking protocol that operates at that layer.

- Students should prepare a brief presentation summarizing their findings.

## **Exit Ticket (5 minutes):**

- Distribute exit tickets to the students.

- Ask them to write down the names of at least three layers of the OSI model and their corresponding purposes.

## **Closure (5 minutes):**

- Review the exit tickets to assess students' understanding of the OSI model.

- Summarize the key points covered in the lesson.

- Emphasize the importance of understanding the OSI model in the field of computer networking.

**Common Core Standards:**

- CCSS.ELA-LITERACY.RST.9-10.3 - Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

- CCSS.ELA-LITERACY.RST.9-10.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.