Lesson 4: Network Topologies

In this lesson, students will learn about network topologies, which define the physical or logical layout of a network. They will be introduced to four main topologies: star, bus, mesh, and ring. The advantages and disadvantages of each topology will be discussed, and students will engage in activities to analyze and compare them. They will also practice selecting appropriate topologies for different scenarios. By the end of the lesson, students will have a solid understanding of network topologies and be able to apply their knowledge in real-world situations.

## **Objectives:**

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

1. Draw and describe a star, bus, mesh, and ring topology.

2. Describe the advantages and disadvantages of the star, bus, mesh, and ring topologies.

3. Select an appropriate topology for a given scenario.

## **Materials:**

- Slides or visual aids illustrating the four network topologies (star, bus, mesh, and ring)

- Activity sheets listing the advantages and disadvantages of each topology

- Paper and pencils for drawing topologies

- Scenarios for selecting appropriate topologies

- Quiz questions related to the network topologies

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

- Display a slide with a network diagram and ask students to identify the type of network topology shown.

- Discuss their answers as a class and briefly review the concept of network topologies.

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

- Introduce the concept of network topologies and explain that they define the physical or logical layout of a network.

- Show slides or visual aids illustrating the four network topologies: star, bus, mesh, and ring.

- Explain that each topology has its own advantages and disadvantages, which will be discussed in detail later in the lesson.

## **Direct Instruction (15 minutes):**

- Present each network topology one by one, explaining its structure and how data is transferred between nodes.

- Provide examples and real-life applications of each topology to help students understand their practical use.

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

- Distribute activity sheets listing the advantages and disadvantages of each topology.

- In pairs or small groups, students discuss and analyze the advantages and disadvantages of each topology.

- Encourage students to think critically and consider different scenarios where each topology might be more suitable.

## **Independent Practice (30 minutes):**

- Provide students with a set of scenarios where they need to select an appropriate network topology.

- In pairs or individually, students draw the topology that would be most suitable for each scenario and justify their answers.

- Circulate the classroom to provide guidance and support as needed.

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

- Administer a quick quiz with questions related to the network topologies covered in the lesson.

- The quiz may include identifying topologies, matching advantages/disadvantages, or selecting appropriate topologies for given scenarios.

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

- Review the key concepts covered in the lesson, including the four network topologies, their advantages and disadvantages, and selecting appropriate topologies for different scenarios.

- Encourage students to continue exploring and researching network topologies to deepen their understanding of computer networks.

**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.