Lesson 3 - Internal Computing Components

In this lesson, students will learn about storage capacity and the prefixes associated with it. They will understand the difference between kilobytes and megabytes and be able to convert between different units of storage capacity. Students will also learn how to determine the relative storage capacity between two storage devices when expressed in bytes. Through various activities and practice problems, students will develop a solid understanding of storage capacity and its importance in the digital age.

Objectives:

1. Students will be able to define and differentiate between the prefixes associated with storage capacity (e.g., kilo, mega, giga, tera).

2. Students will be able to convert between different units of storage capacity (e.g., kilobytes to megabytes).

3. Students will be able to determine the relative storage capacity between two storage devices when expressed in bytes.

Materials:

- Whiteboard or blackboard

- Markers or chalk

- Chart or handout with storage capacity prefixes (kilo, mega, giga, tera)

- Chart or handout with conversion factors for storage capacity units

- Examples of storage devices (e.g., USB drive, hard drive, DVD)

Bell-Ringer Activity:

1. Display the following question on the board: "What is the difference between kilobytes and megabytes?"

2. Give students a few minutes to think and write down their answers individually.

3. After the time is up, ask a few students to share their answers with the class.

Introduction:

1. Begin the lesson by explaining to students that storage capacity is a measure of how much data can be stored in a storage device.

2. Introduce the concept of prefixes associated with storage capacity (kilo, mega, giga, tera) and explain that these prefixes indicate different levels of magnitude.

3. Show students the chart or handout with the storage capacity prefixes and briefly explain what each prefix represents.

Direct Instruction:

1. Explain to students that each prefix represents a power of 10. For example, kilo represents 10^3, mega represents 10^6, giga represents 10^9, and tera represents 10^12.

2. Discuss the relationship between each prefix and its corresponding power of 10.

3. Provide examples of storage devices and their respective storage capacities in bytes, using the prefixes. For example, a USB drive may have a capacity of 16 gigabytes (16 GB) or a hard drive may have a capacity of 1 terabyte (1 TB).

4. Demonstrate how to convert between different units of storage capacity using the conversion factors. Show examples of converting kilobytes to megabytes, megabytes to gigabytes, and so on.

Guided Practice:

1. Distribute the chart or handout with conversion factors for storage capacity units to each student.

2. Give students a few practice problems to solve in pairs or small groups. For example, ask them to convert 500 kilobytes to megabytes or 2 gigabytes to terabytes.

3. Monitor the students' progress and provide assistance as needed.

Independent Practice:

1. Assign a set of practice problems for students to complete individually. These problems should involve converting between different units of storage capacity and determining the relative storage capacity between two storage devices.

2. Provide students with a worksheet or an online platform where they can submit their answers for review.

Exit Ticket:

1. Distribute an exit ticket to each student.

2. Ask students to answer a few short questions to assess their understanding of the lesson objectives. For example, ask them to define the prefixes kilo, mega, giga, and tera, and provide an example of converting between different units of storage capacity.

Closure:

1. Review the key concepts covered in the lesson, including the prefixes associated with storage capacity and how to convert between different units.

2. Emphasize the importance of understanding storage capacity and its prefixes in the digital age.

3. Encourage students to apply their knowledge of storage capacity in real-life situations, such as when purchasing storage devices or managing digital files.