Lesson 4.1: Operating Systems

https://codehs.com/course/23283/lesson/4.1

Description	In this lesson, students will learn about the basic functions and types of operating systems. Students will also explore the process for upgrading and installing Windows and Mac operating systems.
Objective	Students will be able to: • Explain the purpose of operating systems • Identify the main types of operating systems • Analyze the upgrade and installation process for operating systems
Activities	4.1.1 Video: Operating Systems 4.1.2 Check for Understanding: Operating Systems Quiz 4.1.3 Example: Detect My OS 4.1.4 Connection: Upgrading a Mac OS 4.1.5 Example: Windows OS Installation Simulation 4.1.6 Free Response: Installing an OS
Prior Knowledge	• This is an introductory lesson and does not require prior knowledge.
Planning Notes	• Decide if students will take notes in a notebook, on paper handouts, or through the "Take Notes" function on CodeHS. • There are Youtube videos associated with this lesson. If your school has a firewall or disabled access, an alternate link can be found in the associated activity. • There are multiple components and activities to this lesson. Consider when you will complete activities as a class and when students will complete activities independently or with a partner. • There is a handout that accompanies this lesson. It can be used as an in-class activity or a homework assignment. Determine how and if this handout will be used.
Standards Addressed	

| **Teaching and Learning Strategies** | ## Lesson Opener:

- Have students brainstorm and write down answers to the discussion questions listed below. Students can work individually or in groups/pairs. Have them share their responses. [5 mins]

Activities:

- Watch the lesson video and complete the corresponding quiz. This quiz is a quick check for understanding [10-15 mins]
- *Understanding Operating Systems* [7-10 mins]
  - Before watching the video, review the questions that students will answer after the video.
  - Have students watch the Understanding Operating Systems video individually or as a class.
  - Give students 2-3 minutes to complete the free-response questions independently.
  - Review the answers as a class to ensure all students understand.
- Explore the *Detect My OS* activity. [3-5 minutes]
  - Before students press run, take a few volunteers to predict which operating system and its version their computer is running.
  - Have students press "Run" to see if their prediction was correct.
  - Extension: challenge to see if they can determine their operating system on their own.
- Mac and Windows Installation Exploration [5-7 mins]
  - Before watching the videos, review the questions that students will answer after the video.
  - Have students watch *Upgrading a Mac OS* either individually or as a class. [1.5 min]
  - Have students complete the *Upgrading Windows Simulation.* [2 mins]
    - Ensure students click 'See HTML in new window' to begin the simulation
    - Students can enter any number into the product code or leave it blank.
    - The simulation is the same, regardless of which option students choose
    - The percentage will restart once it reaches 100%.
- Complete the *Installing an OS* activity [10-15 mins]
  - Think: Give students 5 minutes to answer the questions independently.
  - Pair: Give students 2 minutes to discuss their answers with their partners. Encourage students to add to their answers based on their discussion.
  - Share: Call on a few pairs to share their responses with the class. [5-10 mins]

Lesson Closer: |

	- Have students reflect and discuss their responses to the end of class discussion questions. [5 mins]

Discussion Questions	## Beginning of class:
	
	- Describe a time when your computer did not do what you intended it to do.
	  - *Answers may vary, but the goal here is to connect the specific challenge to the difficulty of speaking with computers.*
	- What makes a computer a computer?
	  - *Answers may vary, sample responses: the ability to perform computations quickly, the ability to access a wide variety of software or applications, the ability to connect to the internet*
	- Have you ever had to upgrade your phone or computer software? What has that experience been like?
	  - *Answers may vary, students may discuss the new features, the time, the need to restart, how they are informed of the upgrade, how some apps will stop running without the upgrade, the bugs that come with an upgrade*
	
	## End of Class:
	
	- What are three things that the operating system is in charge of?
	  - *The operating system controls hardware, runs software, provides a file structure, and manages and allocates memory.*
	- What are the three main types of operating systems?
	  - *Windows, MacOS and Linux.*
	- Write a haiku (5-7-5) that describes the importance of the operating system on a device.
	  - *Sample haiku: Without the OS/Hardware would be without life/Blank screen forever*

Resources/Handouts	[Multitask Challenges (Student)](#) [Multitask Challenges (Teacher)](#)

Vocabulary

Term	Definition
[operating system (OS)](#)	The primary software that runs applications and manages all the hardware, memory and other software on a computer.
[software](#)	A set of computer instructions that tells the computer how to work.

workstation OS	Most commonly used on a desktop or laptop computer and can perform many tasks without an internet connection.
mobile OS	An operating system used on mobile devices, such as a mobile phone or tablet.
server OS	Used on specialized computers that take in requests and send back a response (mail server, web server, etc).
embedded OS	Will only perform one type of task and are used in machines such as an ATM or a GPS system.
firmware	An operating system that is permanently etched into a hardware device such as a keyboard or a video card.
hypervisor	Operating systems that are most commonly used to run multiple operating systems on a computer system at the same time.

Modification: Advanced	Modification: Students Needing Additional Support	Modification: English Language Learners
• Challenge students to research the differences between the main operating systems. How are they similar? What makes them different?	• Print out video slides for students to reference • *Installing an OS* exercise: check-in with students after they have completed the first set of questions before moving on to the Windows OS questions to ensure they understand the key ideas. Alternatively, allow students to answer the Mac OS questions after the Mac OS video and then the Windows OS questions after the simulation.	• Print out video slides for students to reference • Allow students to use a dictionary to translate keywords: operating system, software