**K- 2 COMPUTING SYSTEMS**

| **GradeK-2** **Lesson duration: 10 days** |
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| **Topic/Title of lesson: Introduction to Computing Devices** |

| **STANDARD(s) ADDRESSED***(Include the performance expectation number and text of each standard.)* |  **8.1.2.CS.2:** Explain the functions of common software and hardware components of computing systems.  |
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| **CS PRACTICE(s)** *that students will engage in throughout the lesson.* | Pattern recognition, Algorithmic thinking |
| **CS CORE IDEA(s) or** **SUB-CONCEPT(s)** *related to the performance expectation(s).* | A computing system is composed of software and hardware.  |
| **CENTRAL FOCUS** *(The central focus is an overarching goal of the lesson or big idea for student learning.)* | Individuals use a wide range of computing devices. Some are stationary and some are mobile. |
| **EU/EQ** (*The enduring understanding(s) and/or essential question(s) that guide the lesson.)* | What is computer hardware? What is computer software?Why do you need both hardware and software inorder for your computer system is work properly? |
| **PRIOR KNOWLEDGE AND CONCEPTIONS** *(What prior knowledge, skills and/or academic language do these students need to have that will help them be successful with this lesson? Any misconceptions you may anticipate?)* | Using pencil and paperShape recognition Letter recognition  |

**UDL/PLANNED SUPPORT**

*(Discuss the universally designed decisions guided by learner diversity and/or individualized adaptations for the variety of learners in your class/group who may require different strategies/support (e.g., children with IEPs or 504 plans, English language learners, children at different points in the developmental continuum, struggling readers, and/or gifted children).*

| **UDL:***How are you universally designing your lesson with your focus learner in mind? What other characteristics of diverse learners are considering through UDL?* | **Multiple means of representation** | **Multiple means of expression** | **Multiple Means of engagement** |
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| Vocabulary will be printed in the classroom, and provided in their worksheet. Terms will be spoken as they are applied in the lesson. Illustrations of various hardware components will be displayed.  | Students can communicate what they know verbally, worksheet completion (individually or with a peer), and exit slip.  | Students can participate by volunteering in the activity, discussion, think-pair-share, individual work. |
| **ADAPTATIONS with focus learner noted:** *If you were not able to meet your focus learners needs through UDL, what individual adaptations will you use to meet your focus learners needs (especially ELLS)* |  |

| **ACADEMIC VOCABULARY/****LANGUAGE**  | *Relevant vocabulary:* *Developing:* computer, hardware, software, apps, keyboard, laptop, desktop, microphone, mouse, headphone, printer, screen, speakers, tablet, smartphone.*Advancing*: applications or apps, programs, central processing unit (CPU), computing, computing devices, computer, document, external hardware, external storage, hard drive, input/output, internal hardware, memory, mobile device, monitor, motherboard, presentation software, scanner, software, storage, troubleshooting, virus, wearable devices | *Describe the supports for each language demand in this lesson. Address whole class and individual needs.*Vocabulary will be printed in the classroom, and provided in their worksheet. Students will work with letter tiles to practice spelling words. Terms will be spoken as they are applied in the lesson. |
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| **LEARNING OBJECTIVES** | **LEARNING CRITERIA** *(How will you know that students have met and/or are moving toward meeting that LO?)* | **ASSESSMENT** *(What will be the pre assessment, formative, or summative assessment(s) in this lesson?)* |
| Define a computing system.  | Students explain in their own words. | Whole class discussion, think-pair-share with notes, exit slip.  |
| Explain that difference between stationary, mobile and wearable computing devices. | Students categorize a group of devices as either stationary, mobile or wearable. | Whole class discussion, small group worksheet completion or and whole class gaming with Kahoot! |
| Apply computational thinking. | Students discuss and provide examples of how they determined the good and not so good things about a computing system (device).  | Student artifact/list of pros and cons for selected computing device. |
| Identify/Explain that computing systems (devices) require both hardware and software to work. | Students identify/explain in their own words. | Students write and repeat factual statement. |
| Define hardware. | Students explain in their own words. | Whole class discussion, think-pair-share with notes, exit slip.  |
| Define a software program. | Students explain in their own words. | Whole group discussion, think-pair-share with notes, formative assessment. |
| Identify/Explain the difference between internal hardware and external hardware. | Students identify/explain in their own words. | Whole class discussion, small group worksheet completion or and whole class gaming with Kahoot! |
| Sort components as either internal or external hardware. | Students label different components of a computing device as either internal hardware or external hardware. | Whole class discussion, individual worksheet, offline or online.  |
| ***Advancing*** |
| Define and explain the job of common internal hardware. | Students investigate a number of common internal components and explain in their own words its function. | Small group discussion, think-pair-share with notes, exit slip. |
| Explain the different types of external hardware (peripheral devices), specifically input/output (I/O) devices. | Students explain I/O devices in their own words. | Small group or individual worksheet completion offline or online. |
| Identify the parts of a computer keyboard. | Students label the different parts of a keyboard. | Small group or individual worksheet completion offline or online using Quizlet, Kahoot or Google Drawing. |
| Define and provide examples of common input devices.  | Students investigate a number of common input devices and explain in their own words its function. | Match a function and input device.Small group discussion, think-pair-share with notes, formative quiz. |
| Define and provide examples of common output devices. | Students investigate a number of common output devices and explain in their own words its function. | Match a function and output device.Small group discussion, think-pair-share with notes, formative assessment. |
| Explain how hardware and software work together. | Students explain in their own words. | Whole group discussion, think-pair-share with notes, exit slip, formative assessment. |
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| Sort the types of apps used at school. | Students discuss the types of apps used at school and place them into categories (word processing, presentation, educational, etc.). | Small group worksheet completion offline or online, create artifact (table/graph) of apps used in school. |

**MATERIALS, RESOURCES, and INSTRUCTIONAL TECHNOLOGY**

| **What resources and technology do you need to teach the lesson:** | **What materials, technology will students need?** |
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| Weblink: [Computer Systems Presentation](https://docs.google.com/presentation/d/15HBJSfNxqNAA6j9Sw_lEGmYGbIuNti2J-woYYfjbFSA/edit?usp=sharing)Presentation is initially thorough. Save a copy and modify it to meet the needs of your learners.[Computing Systems Word Wall](https://www.canva.com/design/DAFq9-g7Dkk/3VT8JIiePpt83rvB9s68TA/view?utm_content=DAFq9-g7Dkk&utm_campaign=share_your_design&utm_medium=link&utm_source=shareyourdesignpanelhIxa0VWNq93YX1lO2Kbx5P-ujC/view?usp=drive_linkg7Dkk/3VT8JIiePpt83rvB9s68TA/view?utm_content=DAFq9-g7Dkk&utm_campaign=share_your_design&utm_medium=link&utm_source=shareyourdesignpanel) Several word walls based on topics covered in the Computer Systems presentation.  | Paper/pencil or laptop with access to the Internet. |

**INSTRUCTIONAL STRATEGIES AND LEARNING ACTIVITIES**

*(Describe explicitly what the teacher and the students will do to meet learning outcomes. Use bulleted or numbered list)*

|  | **What is the teacher doing?** | **What are students doing? (including adaptions)** |
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| **LAUNCH/****Beginning (5 mins)***How will you engage students and capture their interest? 3-7 minutes* | Ask questions like:What is a computing system?What types of devices do you use at home/school?What types of things do you do with a device?Review and outline the goals of the lesson on computing systems.  | Students discuss in small groups and provide answers.  |
| **LEARNING ACTIVITIES/****Middle ( mins)***“I do” “We do” “You do” How will you explain/ demonstrate knowledge /skills required of each objective? How will you ensure that students have multiple opportunities to practice? How will you address the academic language demands?* | This activity is teacher led, moving through the the [Computing Systems](https://docs.google.com/presentation/d/15HBJSfNxqNAA6j9Sw_lEGmYGbIuNti2J-woYYfjbFSA/edit?usp=sharing) presentation. Explain concepts and gather input using inquiry to evaluate students’ understanding of the terms* computing systems
* good and bad of using computer devices.
* stationary, mobile, and wearable devices
* internal computer hardware
* external computer hardware (peripheral devices), specifically I/O devices.
* software or apps
* What apps are used at school.
	+ What does each do?
 | * Group students into pairs or small groups
* Picture recognition for computing devices.
* Categorizing computing devices.
* Categorizing computer hardware as either internal or external.
* Grades K-1 cross curriculum focus
	+ letter recognition
	+ writing practice (letters and words)
	+ pronunciation
	+ drawing/coloring
	+ vocabulary building
	+ create an artifact→ look at a picture of a device, think about its use and then discuss what is good and what is not so good.
	+ create an artifact→ pictures of devices and orally communicate what they are used for.
* Grades 1-2
	+ writing (short sentences)
	+ vocabulary building
	+ create an artifact→ look at a picture of a device, think about its use and then list what is good and what is not so good. Write a summary statement.
	+ create an artifact→ pictures of devices and write one to sentences that explain what tasks it is used for.
* Grade 2 (additional task)
	+ [Grade 2 Pre test and Post Test on Computing Systems.](https://docs.google.com/forms/d/e/1FAIpQLSdmcrYB-IFKLcFPXiteWwLSCqLZ-hWqOTDiLi8Iz0N1ItkkeA/viewform?usp=sf_link)
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| **CLOSURE/****End (5 mins)***How will students summarize and state the significance of what they learned? 3-7 minutes* | Teacher conducts a whole group debrief to recall takeaways and distributes exit slips. | Students complete an exit slip. |
| **Extension/Reinforcement/Homework: See links below.** |
| **Family/Community Engagement—** |

**\* Please attach copies of assessments and/or handouts to be used**

* + [Computing Systems](https://docs.google.com/presentation/d/15HBJSfNxqNAA6j9Sw_lEGmYGbIuNti2J-woYYfjbFSA/edit?usp=sharing) presentation
	+ [Grade 2 Pre test and Post Test on Computing Systems.](https://docs.google.com/forms/d/e/1FAIpQLSdmcrYB-IFKLcFPXiteWwLSCqLZ-hWqOTDiLi8Iz0N1ItkkeA/viewform?usp=sf_link)
	+ [**What is a Keyboard**](https://www.computerhope.com/jargon/k/keyboard.htm)
	+ [Computing Systems Word Wall](https://www.canva.com/design/DAFq9-g7Dkk/3VT8JIiePpt83rvB9s68TA/view?utm_content=DAFq9-g7Dkk&utm_campaign=share_your_design&utm_medium=link&utm_source=shareyourdesignpanelhIxa0VWNq93YX1lO2Kbx5P-ujC/view?usp=drive_linkg7Dkk/3VT8JIiePpt83rvB9s68TA/view?utm_content=DAFq9-g7Dkk&utm_campaign=share_your_design&utm_medium=link&utm_source=shareyourdesignpanel)
	+ [**Traceable Letters Worksheets (Aa to Zz)**](https://www.createprintables.com/alphabet-formation-tracing-worksheet-preschool/)