STEAM Lab - Computer Science for Innovators and Makers
Project: Computer Basics and The History of Operating Systems

Standard(s): CTE: AME 2.4, 2.5, 4.1,4.2,4.3,4.5,5.4
EA B6.1, B11.1, ITC, D2.3

Topic/Theme/Unit:Computer Basics & History of OS

"OPENING"

Teacher:
- Sets objective & purpose
- Identifies standard(s)
- Establishes prior learning
- Builds background knowledge, including pre-teaching key vocabulary

All Students:
- Can restate objective
- Understand the relationship between current and prior learning

Objective(s):

STEAM students will be able to articulate their thoughts about the world of computer science, the role of the computer scientist, the history of computer operating systems and their founders.

Students will be able to demonstrate an understanding of what a modern computer scientist does by creating a group visual research project, completing a graphic organizer based on an OS founder of their choice and presenting their ideas to the class. Students will be able to complete an open book quiz at the end of the unit.

Accomodations:
- Sentence starters to guide students' academic discourse.
- Partner share/collaboration to provide peer support.
- One-on-one teacher support walk students through Google Slides search image features
- Utilize video closed captions to provide ELL with Language Aid Support
- Teacher signs into GoGuardian to view all chromebook desktops and allows students to demonstrate skills as check for understanding
- Encourage students to choose a website portfolio topic of interest, rather than an academic portfolio to promote engagement

"I DO" *(Input & Modeling)*

Teacher:
- Demonstrates new learning
- Models content and meta-cognitive strategies
- Think-Alouds
- Checks for understanding using active participation strategies

All Students:
- Demonstrate active processing of new information by responding appropriately to teacher cues

Day 1-2

Teacher Actions	Student Actions
Teacher begins by asking students "What is a computer scientist?": ▪ *Teacher logs students into the PLTW course and gives an overview.* ▪ *Students are given poster boards and prompted to draw what they think a CS looks like (may be humorous exercise)* ▪ *Students assigned Google Slides research project to search up and gather images and ideas about what a computer scientist does* ▪ Teacher shows video content about computer science from PLTW	▪ Listen actively ▪ Log into Chromebooks ▪ Participate in academic discourse with their peers using sentence starters provided ▪ Students participate in group drawing exercise ▪ Students open Google Slides assignment and complete ▪ Students perform research ▪ Apply their prior knowledge to what is learned in class

Standard(s): CTE: AME 2.4, 2.5, 4.1,4.2,4.3,4.5,5.4
EA B6.1, B11.1, ITC, D2.3

Topic/Theme/Unit:Computer Basics & History of OS

"WE DO TOGETHER" *(Guided Instruction)*

Teacher:

- Uses a variety of engagement and active participation strategies to practice new learning with students
- Checks for understanding and provides immediate corrective feedback

All Students:

- Demonstrate initial understanding by responding appropriately to verbal and other cues

Day 3-5

Teacher Actions	Student Actions
As they complete this lesson, teacher provides individual support for research lesson: ● Teacher reviews rubric ▪ Teacher scaffold and provide support by working 1:1 support ▪ Teacher coordinates student presentation using initial poster board drawing to combine with printed images and ideas from Google Slides	Students participate by learning and practicing research skills: ▪ Student completes group slide using collaboration with peers ▪ Student completes individual slide using research skills ▪ Student completes group posterboard using research and presents ▪ Students identify other questions they may have for independent research ▪ Participate in academic discourse with their peers using sentence starters provided

Pre-planned Questions/ Prompts/Cues:
What kind of industries does a computer scientist work in? What sorts of tasks does a computer scientist do? What products are impacted by Computer Scientists?

CFU Strategies:

-Students search Google and actively participate in above questions with proper conclusions
-Students appear on task and engaged with building Research Slide
-GoGuardian as displayed in front of class audience
-Student completes posterboard with images

STEAM Lab - Computer Science for Innovators and Makers
Project: Computer Basics and The History of Operating Systems

Standard(s): CTE: AME 2.4, 2.5, 4.1,4.2,4.3,4.5,5.4 EA B6.1, B11.1, ITC, D2.3

Topic/Theme/Unit:Computer Basics & History of OS

"YOU ALL DO TOGETHER" *(Collaborative Learning)*

Teacher:

- Predetermines grouping based on identified student needs
- Sets behavioral and procedural expectations for student interaction (i.e. student roles, time, outcomes)
- Monitors, assesses and provides feedback to individuals and groups
- Meets with students for reteaching as needed (more guided practice)

All Students:

- Work together to develop deeper understanding of new learning
- Can explain new learning, with assistance as needed
- Demonstrate an ability to utilize metacognitive strategies previously presented by teacher

Day 6-9

Teacher Actions	Student Actions
Teacher shows "Computer Basics and the History of OS" Google Slides lesson: ▪ Teacher reviews key vocabulary ▪ Teacher shows videos featurings the three OS founders: Steve Jobs (Mac OS), Bill Gates (Windows) and Linus Torvalds (Linux) ▪ Teacher shows additional videos: Apple Super Bowl commercial 1984, Steve Jobs Stanford commencement address ▪ Teacher assigns Graphic Organizer project ▪ Teacher demonstrates YouTube research for further independent learning and exploration ▪ Teacher provides one-on-one support ▪ Teacher rotates around classroom to check for understanding	▪ Students listen actively and take notes during founder videos ▪ Students work independently to complete graphic organizer using google research skills ▪ Students work through creative and technical problems and challenges with their peers ▪ Students identify other questions they may have for independent research ▪ Students share their graphic organizer with the class ▪ Participate in academic discourse with their peers using sentence starters provided

"YOU DO ALONE" *(Independent Practice)*

Teacher:

- Monitors students working independently or in pairs (if in class)
- Assesses student mastery of content
- Intervenes with struggling students as needed through individual or small group instruction

All Students:

- Work independently to apply new learning
- Demonstrate mastery of new learning

Day 4-5

Teacher Actions	Student Actions
▪ Teacher reviews key vocabulary with class ▪ Teacher reviews research and organizer content ▪ Teacher explains open book quiz process and assigns ▪ Teacher guides struggling students and reteaches concepts as necessary ▪ Teacher demonstrates website publish and share features	▪ Student participates in choral reading ▪ Student takes notes ▪ Student completes open book quiz

Standard(s): CTE: AME 2.4, 2.5, 4.1,4.2,4.3,4.5,5.4
EA B6.1, B11.1, ITC, D2.3

Topic/Theme/Unit:Computer Basics & History of OS

"CLOSURE"	
Teacher: ● Restates objective ● Informally assessing attainment of objective (i.e. ticket out the door) **All Students:** ● Can restate objective ● Can self-assess and reflect upon learning	**Final Day:** 1. Student play Kahoot! based on key vocabulary from section 2. Teacher encourages students to share ideas about modern computer scientists they would like to research in the future. Examples: Elon Musk, Mark Zuckerberg, Jeff Bezos, and many others that may come to mind 3. Stress future importance of DEI for BIPOC and women **Intervention:** Based on description of module sections, reteach vocabulary as necessary and review previous videos and materials included in the Computer Basics & History of OS Google Slides. This will be embedded in future lessons or warm ups. Allow student time for revisions and sharing.