GEORGIA | PEACH STATE PATHWAYS

Career, Technical, & Agricultural Education

BUSINESS & COMPUTER SCIENCE

PATHWAY: Computing

COURSE: Beginning Programming

UNIT: 2.2 Hardware and Software Components

INTRODUCTION

Annotation: In this unit, students will explore hardware and software features in computers. Students will explore the various components of the computer, explain their function, and describe the common specifications of each. Teachers will either use lectures, independent assignments, hands-on lab assignments, or possibly group work. Students will use technology to conduct research and possibly use various software programs.

Grade(s):

X	9th
X	10th
X	11th
X	12th

Time: 20 hours

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Additional Author(s):

Students with Disabilities:

For students with disabilities, the instructor should refer to the student's IEP to be sure that the accommodations specified are being provided. Instructors should also familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation.

FOCUS STANDARDS

GPS Focus Standards:

BCS-BP-2 Students will describe the major parts of a processor and how the processor handles execution of a machine language program.
a. List and describe the function of the major components of the processor (ALU, registers, program counter, etc).
b. Describe the steps in the execution of a simple assembler program.
c. Choose an assembler program that is equivalent to a small high-level program. Solve simple binary arithmetic problems. Explain the interaction between the operating system and the processor.

BCS-BP-3 Students will explain the process that turns a high-level language program into something a computer can execute.
a. Explain the purpose of a compiler, interpreter, and assembler.
b. Compare and contrast a compiler and an interpreter and specify languages that use each.
c. Compare and contrast high-level and low-level languages for different uses.

BCS-BP-4 Students will explore different representations of images and music in a computer.
a. Explain the difference between bitmapped and vector-based representations of images.
b. Explain the difference between MIDI and sampled sound representations of music.
c. Write a program to modify a bitmapped image and/or sampled sound.

GPS Academic Standards:

MM3P4 Students will make connections among mathematical ideas and to other disciplines.

ELA11W1 The student produces writing that establishes an appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals a satisfying closure.

ELA11W2 The student demonstrates competence in a variety of genres.

ELA11LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.

MM4A10 Students will understand and use vectors.

National Standards:

UNDERSTANDINGS & GOALS

Enduring Understandings:

- After completing the unit, students will be able to discuss hardware and software concepts in computers. Students will also have an opportunity to design computer systems based on specifications.

Essential Questions:

- What are the major hardware and software components of a computer?
- How are computer features different from one another?
- How is a computer set up properly?

- What is the best computer?
- How are numbers and characters represented in computers?
- What are the parts of a computer?

Knowledge from this Unit:

- Students will be able to describe the major hardware and software components of a computer and their interaction.
- Students will be able to compare and contrast computer features.
- Students will understand the terms and units used for computer parts.
- Students will be able to list the steps in setting up a computer.
- Students will choose computers for different settings.
- Students will explain how numbers and characters are represented in computers.
- Students will be able to identify the parts of a computer.

Skills from this Unit:

- Students will use the Internet to perform searches for relevant concepts.

ASSESSMENT(S)

Assessment Method Type: Select one or more of the following. Please consider the type(s) of differentiated instruction you will be using in the classroom.

_____ Pre-test
X Objective assessment - multiple-choice, true- false, etc.
_x_ Quizzes/Tests
__ Unit test
_____ Group project
X Individual project
_____ Self-assessment - May include practice quizzes, games, simulations, checklists, etc.
__ Self-check rubrics
__ Self-check during writing/planning process
__ Journal reflections on concepts, personal experiences and impact on one's life
__ Reflect on evaluations of work from teachers, business partners, and competition judges
__ Academic prompts
__ Practice quizzes/tests
_____ Subjective assessment/Informal observations
__ Essay tests
__ Observe students working with partners
__ Observe students role playing
_____ Peer-assessment
__ Peer editing & commentary of products/projects/presentations using rubrics
__ Peer editing and/or critiquing
_____ Dialogue and Discussion

_____
__ Student/teacher conferences
__ Partner and small group discussions
__ Whole group discussions
__ Interaction with/feedback from community members/speakers and business partners

_____ Constructed Responses
__ Chart good reading/writing/listening/speaking habits
__ Application of skills to real-life situations/scenarios

_____ Post-test

Assessment(s) Title: Terms and Concepts

Assessment(s) Description/Directions:

Throughout the unit, students should be quizzed approximately once a week over vocabulary and terminology. This unit has a high number of terms that must be mastered in order to describe the functions of each part of a computer.

Attachments for Assessment(s):

Web Resource Title: Google Directory of Computer Terminology

Web Resource Description: A list of common parts of a computer along with descriptions of each.

Web Resource: http://www.google.com/Top/Computers/Hardware/Components/

LEARNING EXPERIENCES

Instructional planning: Include lessons, activities and other learning experiences in this section with a brief description of the activities to ensure student acquisition of the knowledge and skills addressed in the standards. Complete the sequence of instruction for each lesson/task in the unit.

Sequence of Instruction

1. **Identify the Standards. Standards should be posted in the classroom for each lesson.**

   BCS-BP-2 Students will describe the major parts of a processor and how the processor handles execution of a machine language program.
   BCS-BP-3 Students will explain the process that turns a high-level language program into something a computer can execute.
   BCS-BP-4 Students will explore different representations of images and music in a computer.

2. **Review Essential Questions.**

   - What are the major hardware and software components of a computer?
   - How are computer features different from one another?
   - How is a computer set up properly?
   - What is the best computer?
   - How are numbers and characters represented in computers?
   - What are the parts of a computer?

3. **Identify and review the unit vocabulary.**

4. Assessment Activity.

(Based on a 50 minute period)

Week 1

Hardware Components

Week 2

Software Components

Week 3

Building a Computer System

Representing Numbers and Characters

Bits & Bytes in a Computer

Week 4

"Computer Hardware" Diagram

Technology Connection/Integration

Students will be using technology to search for computer parts and view videos and images when learning about parts. Students will also be using technology to describe the parts of the computer. Teachers will use a projector or interactive whiteboards to show the various parts of the computer to students.

Attachments for Learning Experiences: Please list.

Notes & Reflections:

CULMINATING PERFORMANCE TASK (Optional)

Culminating Unit Performance Task Title: **Computer Hardware Diagram**

Culminating Unit Performance Task Description/Directions/Differentiated Instruction:

Students will use the Internet to get pictures of various computer parts to build a "computer." Complete specifications and rubric are below.

Attachments for Culminating Performance Task:

Computer Hardware Diagram Assignment

The first step to creating a computer is having a system unit to connect and protect the hardware components. Use the black paper, tape and scissors provided to create a system unit.

As we discuss each computer hardware part, you will use the internet to find a picture of the hardware to put into your system unit. You can use Google, Yahoo, etc. to find each part. Once, you have found the hardware part, you should copy it into word and then write at least 2 sentences about the part, describe a current common specification for the part, which parts of the computer interacts with this part, and describe the function of each, then print. Cut your hardware and sentences out and then tape or glue the hardware into your system unit in the area in which it would be located.

You will turn your completed system unit in at the end of the Introduction to Computer Hardware unit. The system unit will be graded using the following rubric:

4 The system unit showed a clear understanding of computer hardware and its function within the system unit. The system unit contains **all** the hardware parts and at least two **correct** sentences about each part.	**3** The system unit showed a clear understanding of computer hardware and its function within the system unit. The system unit contains **most** the hardware parts and at least two **correct** sentences about each part. OR The system unit contains **all** of the hardware parts and two **incorrect** sentences about each part.
2 The system unit shows **some** understanding of computer hardware and its function within the system unit. The system unit contains **some** of the hardware parts and at least **one correct** sentence about each part.	**1** The system unit **does not show a clear understanding** of computer hardware and its function within the system unit. The system unit contains **some** of the hardware parts and **no sentences** about each part.
0 You did not create a system unit with the proper hardware parts included.	

Grading Scale: 4 = 100
3 = 85
2 = 70
1 = 50
0 = 0

UNIT RESOURCES

Web Resources:

Attachment(s):

Materials & Equipment:

Computer

Poster board

Glue

Scissors

Printer

Internet access

What 21st Century Technology was used in this unit:

X	Slide Show Software		Graphing Software	X	Audio File(s)
	Interactive Whiteboard		Calculator		Graphic Organizer
	Student Response System	X	Desktop Publishing	X	Image File(s)
	Web Design Software		Blog	X	Video
	Animation Software		Wiki		Electronic Game or Puzzle Maker
	Email	X	Website		