GEORGIA MIDDLE SCHOOL Instructional Resources

CAREER, TECHNICAL, & AGRICULTURAL EDUCATION

BUSINESS & COMPUTER SCIENCE

COURSE: Business & Computer Science

UNIT 9: Information Systems

INTRODUCTION

Annotation:

In this unit students will be able to demonstrate an understanding of information system careers. Students will explore the steps necessary to program computers for tasks and how computers handle those tasks. Common computer networking models will also be examined.

Grade(s):

	6th
X	7th
	8th

Time:

Five 50 minute class periods

Author:

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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 appropriately. 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. Many students (both with and without disabilities) who struggle with reading may benefit from the use of text reading software or other technological aids to provide access to printed materials. Many of these are available at little or no cost on the internet.

FOCUS STANDARDS

GPS Focus Standards:

MSBCS-BCSII-12- The student will examine career requirements, job responsibility, employment trends, and opportunities for careers in networking, programming, and computer science.

a) Discuss characteristics and opportunities that lead to the development of a successful career in networking, programming, and computer science.
b) Create a flow chart to demonstrate their understanding of basic programming concepts.
c) Compare and contrast types of networks, including LANs versus WANs and wireless versus wired.
d) Diagram a LAN for home & small business & essential components needed.
e) Create & use basic programming terms in context & in keying/designing a given program.

GPS Academic Standards:

ELA7R2 The student understands and acquires new vocabulary and uses it correctly in reading and writing.
ELA7W2 The student demonstrates competency in a variety of genres.
ELA7W3 The student uses research and technology to support writing.
ELA7W4 The student consistently uses the writing process to develop, revise, and evaluate writing.
ELA7LSV1 The student participates in student-to-teacher, student-to-student, and group verbal interactions.
ELA7LSV2 The student listens to and views various forms of text and media in order to gather and share information, persuade others, and express and understand ideas.
M7A2 Students will understand and apply linear equations in one variable.
M7P1 Students will solve problems (using appropriate technology).
M7P3 Students will communicate mathematically.
S7CS2 Students will use standard safety practices for all classroom laboratory and field investigations.

National / Local Standards / Industry / ISTE:

Standard 1 Assess the impact of information technology on society.
Standard 2 Analyze and design information systems using appropriate development tools.
Standard 3 Describe positions and career paths in information technology.

UNDERSTANDING & GOALS

Enduring Understandings:

- Keyboarding is used in many career and educational tasks.
- Keyboarding technique should be consistently practiced.
- Computers are machines that must follow instructions to perform tasks.
- Computer software contains computer instructions.
- People write the instructions to the computer to perform tasks.
- Computer programs are step-by-step instructions written in computer-readable language.
- Some computer science careers have the job task of writing instructions to the computer.

Essential Questions:

- What career opportunities are available in networking, programming, and computer science?
- How are flowcharts used to plan computer instructions?
- How can computers be networked?
- How can a computer be programmed to perform a task?

Knowledge from this Unit:

Students will be able to:

- Describe the nature of the tasks, salary ranges, education/training, and job outlooks for careers in networking, programming, and computer science.
- Explain how flowcharting improves thought processes and clearly defines steps.
- Explain differences between LAN/WAN and wired/wireless networks.
- Describe the function of programming in computers to perform tasks in a computer-readable language.
- Identify careers in networking, programming, and computer science.
- Define LAN/WAN and wired/wireless networks.

Skills from this Unit:

Students will be able to:

- Prepare a flowchart of a decision-making process.
- Create an animation program using *Scratch* software.

ASSESSMENTS

Assessment Method Type:

____ Pre-test
x Objective assessment - multiple-choice, true- false, etc.
__ Quizzes/Tests
_x Unit test
x 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
x Subjective assessment/Informal observations
__ Essay tests
_x_ Observe students working with partners
__ Observe students role playing
____ Peer-assessment
__ Peer editing and 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

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

x Post-test

Assessment(s) Title:

Programming Test

Assessment(s) Description/Directions:

Create animation project using *Scratch* software.

Attachments for Assessment(s):

Programming Test
Programming Rubric

LESSON PLANS

- **INTRODUCTION**

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

   MSBCS-BCSII-12- The student will examine career requirements, job responsibility, employment trends, and opportunities for careers in networking, programming, and computer science.
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   d) Diagram a LAN for home & small business & essential components needed.
   e) Create & use basic programming terms in context & in keying/designing a given program.

2. **Review Essential Questions**

   - What career opportunities are available in networking, programming, and computer science?
   - How are flowcharts used to plan computer instructions?
   - How can computers be networked?
   - How can a computer be programmed to perform a task?

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

- **Network –** connects one computer to other computers and devices, allowing the sharing of data and resources.
- **File – a** collection of related data or program records stored on some medium.
- **Wireless –** networking technology such as Wi-Fi and Bluetooth.
- **Wired –** networking technology using cables to connect computers, file servers, and hubs.
- **Server –** computer that shares files, drive space, and other resources with other workstations.
- **Cable –** wires that connect workstations to each other, file servers, and hubs.
- **Internet –** global network of countless computers, allowing millions of people to share information.
- **Workstation –** computer that is connected to the network.
- **Hub –** connects all workstations to each other and to the file server.
- **Local –** referring to computers connected to each other within one room or building.
- **Data –** raw facts that are entered into a computer.
- **Information –** computer processed data.
- **Debug –** remove errors from computer program.

4. **Assessment Activity**

Students will design, create, and program an animation project using *Scratch*.

• LESSON 1: INFORMATION SYSTEMS CAREERS

Discussion

- Students choose an information systems career. Using www.bls.gov, collect information about the career. (*Career Research* handout)
- Using Microsoft Publisher or Word, create a flyer to display the information about the career. (*Flyer Rubric*)

• LESSON 2: FLOWCHARTING

Discussion

- Discuss flowcharting symbols (*Flowchart Symbols* handout).
- Model flowcharting problem: Spread peanut butter on a cracker. (*Flowchart Sample* handout)
- In teams of two, draw flowcharts to demonstrate the solution for math problems. Have class discussion of correct solutions. (*Flowchart Math* handout)
- ***Possible modification:*** Give student flowchart sample with some symbols completed. Also, give student math activity with symbols and have him/her write the steps inside the appropriate symbols.

• LESSON 3: NETWORKS

Discussion

- Discuss terminology. Complete *Vocabulary* handout as terms are discussed.
- Discuss networks and complete the *Graphic Organizer-Networks* handout.
- Using Microsoft Word clip art and drawing tools, create a representation of a LAN network. (see *LAN Sample*)
- ***Possible modifications:*** Give defined terms to student. Also, draw LAN network with pencil and paper.

• LESSON 4: PROGRAMMING

Discussion

- View Scratch sample projects.
- Demonstrate basic programming concepts using tools.
- Follow *Scratch* GETTING STARTED GUIDE to discuss program code.
- In teams of two students, create a Scratch project. (*Scratch* Program and Programming Rubric)
- Animate an object, moving left to right.
- Add sound, change color, select stage, add loop.
- Run and debug program.
- ***Possible modifications:*** 1) Follow sample steps in *Scratch* packet or 2) follow sample steps in Scratch packet and create a new project, reducing the project requirements. (for example, moves object and adds sound only).

• LESSON 5: ASSESSMENT

Discussion

- Create *Scratch* program. (Programming Test and Programming Rubric handouts)

• ATTACHMENTS FOR LESSON PLANS

Career Research
Flyer Rubric
Flowchart Symbols
Flowchart Sample
Flowchart Math
Flowchart Math—Key
Vocabulary
Graphic Organizer—Networks
LAN Sample
Scratch Program
Programming Rubric
Programming Test

• NOTES & REFLECTION

- Students need basic word processing or desktop publishing skills.
- Students need to be able to navigate the Internet given a web site address.

UNIT RESOURCES

Web Resources:

http://scratch.mit.edu/

http://info.scratch.mit.edu/Support)
www.bls.gov

Materials & Equipment:

Computer
Scratch software from http://scratch.mit.edu/ website
Scratch Getting Started with Scratch packet (print from Help menu in software)
Scratch Reference Cards (print from *Scratch* support page--*http://info.scratch.mit.edu/Support*)

21st Century Technology Used:

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