GEORGIA | PEACH STATE PATHWAYS

Career, Technical, & Agricultural Education

COMPUTING

PATHWAY: Computer Systems and Support

COURSE: Information Technology Essentials

UNIT 9: Safety & Environment Essentials

# INTRODUCTION

**Annotation:** In this lesson, students will describe the aspects and importance of safety and environmental issues. Students will also identify potential hazards in the workplace and implement proper safety procedures including ESD precautions and procedures, safe work environments, and equipment handling.

**Grade(s):**

| | |
|---|---|
| X | 9th |
| X | 10th |
| X | 11th |
| X | 12th |

**Time:** Fifteen 50-minute class periods

**Author:** Emil L. Decker

**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-ITE-23.** **Students will describe the aspects and importance of safety and environmental issues.**
a. Identify potential safety hazards and take preventive action.
b. Use Material Safety Data Sheets (MSDS) or equivalent documentation and appropriate equipment documentation.
c. Use appropriate repair tools.
d. Describe methods to handle environmental and human (e.g. electrical, chemical, physical) accidents including incident reporting.

**BCS-ITE-24.** **Students will identify potential hazards and implement proper safety procedures including BCS-ITE-1ESD precautions and procedures, safe work environment, and equipment handling.**
a. Know safety and handling procedures and disposal requirements for batteries, display devices, and chemical solvents and cans.

## GPS Academic Standards:

| | |
|---|---|
| **ELA10RL5** | **The student understands and acquires new vocabulary and uses it correctly in reading and writing.** |
| **ELA10RC3** | **The student acquires new vocabulary in each content area and uses it correctly.** |
| **ELA10RC4** | **The student establishes a context for information acquired by reading across subject areas.** |
| **ELA10LSV1** | **The student participates in student-to-teacher, student-to-student, and group verbal interactions.** |
| **SCSH3** | **Students will identify and investigate problems scientifically.** |
| **SCSh7** | **Students will analyze how scientific knowledge is developed.** |
| **SCSh2** | **Students will use standard safety practices for all classroom laboratory and field investigations.** |
| **SCbSh3** | **Students will identify and investigate problems scientifically.** |
| **SCSh6** | **Students will communicate scientific investigations and information clearly.** |
| **SEV1** | **Students will investigate the flow of energy and cycling of matter within an ecosystem and relate these phenomena to human society.** |
| **SEV2** | **Students will demonstrate an understanding that the Earth is one interconnected system.** |
| **SEV3** | **Students will describe stability and change in ecosystems.** |
| **SEV4** | **Students will understand and describe availability, allocation and conservation of energy and other resources** |
| **SEV5** | **Students will recognize that human beings are part of the global ecosystem and will evaluate the effects of human activities and technology on ecosystems.** |

## National / Local Standards / Industry / ISTE:

| | |
|---|---|
| **ITEA – 5** | **Students will develop an understanding of the effects of technology on the environment.** |
| **ITEA – 10** | **Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.** |
| **ITEA – 11** | **Students will develop the abilities to apply the design process.** |
| **ITEA – 12** | **Students will develop the abilities to use and maintain technological products and systems.** |
| **ITEA – 13** | **Students will develop the abilities to assess the impact of products and systems.** |

| | |
|---|---|
| **ITEA – 14** | **Students will develop an understanding of and be able to select and use medical technologies.** |
| **ITEA – 15** | **Students will develop an understanding of and be able to select and use agricultural and related biotechnologies.** |
| **ITEA – 17** | **Students will develop an understanding of and be able to select and use information and communication technologies.** |

## UNDERSTANDINGS & GOALS

### Enduring Understandings:

Students will be able to identify and use standard safety procedures for the proper use, maintenance, and disposal of information system equipment. Students will also recognize the environmental impact of this equipment at its "end of life", and how recycling and proper disposal can minimize those impacts.

### Essential Questions:

- What are standard office safety procedures for the use of information system equipment?
- How do I protect myself and the equipment during troubleshooting or repair?
- What are the proper steps to dispose of equipment at its end of life?
- What opportunities exist for recycling old equipment?

### Knowledge from this Unit:

Students will be able to:

- Identify the proper use and care for equipment.
- Describe how to properly dispose of equipment
- Safely troubleshoot malfunctioning equipment

### Skills from this Unit:

- Students will be able to install, use, troubleshoot, and dispose of information system equipment.

## ASSESSMENTS

### Assessment Method Type:

X Pre-test
X Objective assessment - multiple-choice, true- false, etc.
_x_ Quizzes/Tests
__ Unit test
X Group project
___ Individual project
X 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
_X_ 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 & commentary of products/projects/presentations using rubrics
__ Peer editing and/or critiquing
_X_ Dialogue and Discussion
__ Student/teacher conferences
_X_ Partner and small group discussions
_X_ 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 Attachments and / or Directions:**

**Safety Poster**

# LESSON PLANS

## • LESSON 1: BASIC SAFETY CONSIDERATIONS

1. Identify the standards. Standards should be posted in the classroom.

   **BCS-ITE-23. Students will describe the aspects and importance of safety and environmental issues.**
   a. Identify potential safety hazards and take preventive action.
   b. Use Material Safety Data Sheets (MSDS) or equivalent documentation and appropriate equipment documentation.
   c. Use appropriate repair tools.
   d. Describe methods to handle environmental and human (e.g. electrical, chemical, physical) accidents including incident reporting.

2. Review Essential Question(s). Post Essential Questions in the classroom.

   What are standard office safety procedures for the use of information system equipment?

3. Teacher will have students fill out the Anticipation Guide to determine what they know prior to completing the unit. (See Attachment: **Anticipation Guide.doc**)

4. Interest approach – Mental set

   How many work related injuries occur each year due to faulty computer equipment and peripherals? Are there safety rules you are expected to follow regarding computer equipment? Are they posted somewhere, or are employees required to review them regularly? Do schools need to address this issue?

5. Discuss basic safety considerations when working with computers. (See Attachment: **Computer Safety Websites.doc**)
   Topics might include:

- Physical safety, such as proper methods of lifting and moving heavy equipment, tripping hazards, etc.

- Electrical safety, such as frayed electrical cords, not working on equipment while it is turned on, multiple extension cords, overloaded circuits, etc.
- Network security, such as passwords, proper online procedures, etc.

## • LESSON 2: SAFETY PROCEDURES DURING TROUBLESHOOTING

1. Identify the standards. Standards should be posted in the classroom.

   **BCS-ITE-24. Students will identify potential hazards and implement proper safety procedures including BCS-ITE-1ESD precautions and procedures, safe work environment, and equipment handling.**
   a. Know safety and handling procedures and disposal requirements for batteries, display devices, and chemical solvents and cans.

2. Review Essential Questions. Post Essential Questions in the classroom.

   • How do I protect myself and the equipment during troubleshooting or repair?

3. Demonstrate proper safety procedures while troubleshooting and working within computer cases.

4. The presentations Printer or Mouse, and Problems are humorous in nature, but can lead to productive discussions. (See Attachments: **Printer or Mouse.doc** & **Problems.ppt**)

## • LESSON 3: SAFETY AWARENESS

1. Review Essential Questions. Post Essential Questions in the classroom.

   • What are standard office safety procedures for the use of information system equipment?

2. Create Safety posters related to computer repair. If opportunities exist, create a PSA to be shown on the school media channel. (See Attachment: **Safety Poster.doc**)

## • LESSON 4: ENVIRONMENTAL CONCERNS

1. Identify the standards. Standards should be posted in the classroom.

   **BCS-ITE-23. Students will describe the aspects and importance of safety and environmental issues.**
   a. Identify potential safety hazards and take preventive action.
   b. Use Material Safety Data Sheets (MSDS) or equivalent documentation and appropriate equipment documentation.
   c. Use appropriate repair tools.
   d. Describe methods to handle environmental and human (e.g. electrical, chemical, physical) accidents including incident reporting.

2. Review Essential Question(s). Post Essential Questions in the classroom.

   - What are the proper steps to dispose of equipment at its end of life?
   - What opportunities exist for recycling old equipment?

3. Show the Recycling presentation. Discuss environmental concerns with information technology wastes. What can be done to minimize this waste and the impact it has on the environment? (See Attachments: **Recycle.ppt** & **Recycling Facts.doc**)

4. Have students visit the EPA website to find local places to recycle old computers and other electronics. (**http://www.epa.gov/osw/conserve/materials/ecycling/donate.htm**)

## • ATTACHMENTS FOR LESSON PLANS

**Anticipation Guide.doc**
**Computer Safety.doc**
**Printer or Mouse.doc**
**Problems.ppt**
**Safety Poster.doc**
**Recycle.ppt**
**Recycling Facts.doc**
**Recycling Project.doc**

## • NOTES & REFLECTION:

Posters, PSA's, etc. may be adjusted to meet school and community resources. Some schools do a morning announcement show where video would be very appropriate. Other schools may have a continuous PowerPoint scrolling set of announcements where that format may be applied.

If no recycling program is presently operating in your school, this would be a good project for the class to start. If such programs already exist, do they include recycling information systems waste as well as the standard recyclables? Promotion of these programs, if already in existence, would certainly be appreciated by those who are currently running them.

# CULMINATING PERFORMANCE TASK

### Culminating Unit Performance Task Title:

Create a Recycling Program

### Culminating Unit Performance Task Description/Directions/Differentiated Instruction:

Create a recycling program to address the waste created by the information systems equipment owed at the school, district, and within the community.

### Attachments for Culminating Performance Task:

**Recycling Project**

# UNIT RESOURCES

### Web Resources:

**http://www.howstuffworks.com/recycle-one-thing.htm**
**http://science.howstuffworks.com/landfill-quiz.htm**
**http://science.howstuffworks.com/e-waste-recycling-law.htm**
**http://electronics.howstuffworks.com/e-waste.htm**
**http://videos.howstuffworks.com/dell/675-dell-shows-how-to-recycle-pcs-video.htm**
**http://computer.howstuffworks.com/discarded-old-computer.htm**
**http://electronics.howstuffworks.com/how-to-tech/how-to-donate-computer.htm**

**http://electronics.howstuffworks.com/electronics-recycling.htm**
**http://www.epa.gov/waste/conserve/materials/ecycling/donate.htm**
**http://www.crc.org/**
**http://earth911.com/electronics/computers/**
**http://www.epa.gov/epawaste/index.htm**
**http://www.cristina.org/**
**http://www.eco-action.net/pollution.html**

## Materials & Equipment:

## 21st Century Technology Used:

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