Unit E: Arrays

Content Area: **CTE**
Course(s): **Honors Game Programming in C++**
Time Period: **December**
Length: **2**
Status: **Published**

Unit Overview:

- In this unit, students will learn many of the different aspects of arrays and the benefits of using arrays.
- Students will also learn a variety of sorts and searches and types of arrays

Enduring Understandings:

- Arrays collections are useful for storing lists of data that can be easily manipulated.
- Sorting and searching techniques are necessary to effectively organize and process large amounts of data.
- Students will understand the time that can be saved by using arrays throughout their codes

Essential Questions:

- How can a single array element be passed to a procedure?
- How is the Length property of an array useful in traversing the array?
- Why is an array passed to a procedure ByRef instead of ByVal?

Standards/Indicators/Student Learning Objectives (SLOs):

- SWBAT: Create and properly use a Multi-Dimensional Array
- SWBAT: Create and properly use an Array in a program.
- SWBAT: search a certain element and and sort an array.
- SWBAT: traverse thru an array's elements.

TECH.8.1.12.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.12.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.12.C	Communication and Collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.12.D	Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
TECH.8.1.12.E	Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.12.F	Critical thinking, problem solving, and decision making: Students use critical thinking skills

	to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.12.A	The Nature of Technology: Creativity and Innovation: Technology systems impact every aspect of the world in which we live.
TECH.8.2.12.B	Technology and Society: Knowledge and understanding of human, cultural and society values are fundamental when designing technology systems and products in the global society.
TECH.8.2.12.C	Design: The design process is a systematic approach to solving problems.
TECH.8.2.12.D	Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.
TECH.8.2.12.E	Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

Lesson Titles:

- Lesson: Multi-Dimensional Array
- Lesson: Numeric Array
- Lesson: Parallel Array
- Lesson: Sorting and Searching Array
- Lesson: String Array
- Program: Music Rack
- Program: Teacher Array

Career Readiness, Life Literacies, & Key Skills

TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.9.4.12.CI.2	Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).

Inter-Disciplinary Connections:

- Art
- English
- History
- Math
- Music
- Science

LA.RH.11-12	Reading History

MA.A-SSE	Seeing Structure in Expressions
MA.A-SSE.B	Write expressions in equivalent forms to solve problems
LA.RST.11-12	Reading Science and Technical Subjects
MA.A-CED	Creating Equations
LA.WHST.11-12	Writing History, Science and Technical Subjects
MA.A-REI	Reasoning with Equations and Inequalities
SCI.9-12.5.1.12.A	Students understand core concepts and principles of science and use measurement and observation tools to assist in categorizing, representing, and interpreting the natural and designed world.
SCI.9-12.5.1.12.C	Scientific knowledge builds on itself over time.
SOC.9-12.1.1	Chronological Thinking
SOC.9-12.1.3	Critical Thinking
SOC.9-12.1.4	Presentational Skills
VPA.1.1.12.B	Music
VPA.1.1.12.D	Visual Art

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:

- IS: • Extra Time to complete Programs
- IS: • NHS Assistance and Tutoring
- IS: • One on One tutoring during Delsea One
- Program: 1 to 100 Array
- Program: 12 Days at Hogwarts
- Program: 2D Array
- Program: Coffee Array
- Program: Compare Arrays
- Program: Month Array
- Program: Payroll Array
- Program: Types of Searches
- Program: Types of Sorts

Modifications

ELL Modifications:

- Choice of test format (multiple-choice, essay, true-false)
- Continue practicing vocabulary
- Provide study guides prior to tests
- Read directions to the student

- Read test passages aloud (for comprehension assessment)
- Vary test formats

IEP & 504 Modifications:

- Allow for redos/retakes
- Assign fewer problems at one time (e.g., assign only odds or evens)
- Differentiated center-based small group instruction
- Extra time on assessments
- Highlight key directions
- If a manipulative is used during instruction, allow its use on a test
- Opportunities for cooperative partner work
- Provide reteach pages if necessary
- Provide several ways to solve a problem if possible
- Provide visual aids and anchor charts
- Test in alternative site
- Tiered lessons and assignments
- Use of a graphic organizer
- Use of concrete materials and objects (manipulatives)
- Use of word processor

G&T Modifications:

- Alternate assignments/enrichment assignments
- Enrichment projects
- Extension activities
- Higher-level cooperative learning activities
- Pairing direct instruction with coaching to promote self-directed learning
- Provide higher-order questioning and discussion opportunities
- Provide texts at a higher reading level
- Tiered assignments
- Tiered centers

At Risk Modifications

- Additional time for assignments
- Adjusted assignment timelines
- Agenda book and checklists

- Answers to be dictated
- Assistance in maintaining uncluttered space
- Books on tape
- Concrete examples
- Extra visual and verbal cues and prompts
- Follow a routine/schedule
- Graphic organizers
- Have students restate information
- No penalty for spelling errors or sloppy handwriting
- Peer or scribe note-taking
- Personalized examples
- Preferential seating
- Provision of notes or outlines
- Reduction of distractions
- Review of directions
- Review sessions
- Space for movement or breaks
- Support auditory presentations with visuals
- Teach time management skills
- Use of a study carrel
- Use of mnemonics
- Varied reinforcement procedures
- Work in progress check

Formative Assessment:

- Anticipatory Set
- Closure
- Pre-Programs
- Program Examples
- Teacher/Student Review
- Warm-Up

Summative Assessment:

- Alternate Assessment
- Benchmark
- Classwork/Homework
- Group Programs

- Large Programs
- Marking Period Assessment
- Quiz: Simple Arrays
- Small Programs
- Test: Arrays

Alternative assessments

Performance tasks
Project-based assignments
Problem-based assignments
Presentations
Reflective pieces
Concept maps
Case-based scenarios
Portfolios

Benchmark Assessments

Skills-based assessment
Reading response
Writing prompt
Lab practical

Resources & Materials:

- Games and Graphics in C++ Tony Gaddis
- AGK2 Gaming Library
- Computer Lab
- Google Classroom
- Microsoft Visual Studios
- Powerpoint
- Screen Sharing software
- Various Websites

Technology:

- Adobe Photoshop

- AGK2 Gaming Library
- Google Classroom
- Microsoft Visual Studios
- Screen Sharing Software
- Various Websites: classroom.google.com; classdojo.com; repl.it

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