Unit 3-Strings

Content Area: **Technology**
Course(s): **Sample Course**
Time Period: **OctNov**
Length: **17 days, Grades 10-12**
Status: **Published**

Strings

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

AP Computer Science A - Java

Strings

Belleville Board of Education

56 Ralph Street

Belleville, NJ 07109

Prepared by: Teacher, Corey Woodring

Dr. Richard Tomko, Ph.D., M.J., Superintendent of Schools

Ms. LucyAnn Demikoff, Director of Curriculum and Instruction K-12

Ms. Nicole Shanklin, Director of Elementary Education K-8

Mr. Joseph Lepo, Director of Secondary Education

Board Approved:

Unit Overview

Unit Overview - AP Essential Knowledge
A: STUDENTS WILL KNOW: • How to create and initialize Strings • How call to various built-in methods when working with Strings to perform tasks • How to begin programming with objects in mind ***B: STUDENTS WILL UNDERSTAND THAT:*** • String objects are more versatile with function ability than primitive data types • Object-Orientated programming is more efficient to program with than top-to-bottom programing • Variables within methods cannot be used throughout the entire program ***C: STUDENTS WILL BE ABLE TO:*** • Select and implement appropriate built in string methods to perform key tasks when writing programs • Create strings to increase the versatility and complexity when writing programs

- Begin to program with an object-oriented paradigm in mind through the creation of user-defined method
- Understand the existence of variables and how they are affected through various actions throughout the s
- Use various commands from the math library in the context of a program
- Examine and debug compiler and runtime errors within programs
- Format output to a console

Enduring Understanding

All data stored on a computer is ultimately stored as a sequence of 0s and 1s. This includes text, digital books, images, songs, videos, and "executable files" like games and applications. Strings, an example of text data, are stored in the following way:

- a string is a sequence of characters (e.g., the string "Hello, World!" contains 13 characters including letters like "H", "e" and punctuation like " ", "!"
- each character is actually represented by a number (e.g., "H" is represented by the number 40; this is its ASCII/Unicode value)

(Numbers are stored internally in a 0-1 binary format.)

Strings, which are widely used in Java programming, are a sequence of characters. In the Java programming language, strings are objects.

Essential Questions

Essential Questions

1. How are characters and string objects used in programs?
2. How can we write and compare string objects?
3. How can we use formatting for outputs with numeric values?
4. How can we cast between a character, string, and numeric data type?
5. How can we work with the string data type to: determine its length, obtain a character, concatenate string
6. How is programming with object-orientation in mind different than the top-to-bottom approach?

Exit Skills

Exit Skills - Assessment

- Complete various written checkpoint exercises that focus on the explanation and description of computer basics.
- Develop a visual representation of the communication processes within a computer using appropriate ter
- Properly document a program using correct indentation, spacing, and comment style.
- Debug programs and determine the types of errors in the program.
- Create programs based on programming exercises that display various types of output using string and n
- Unit 1 Assessment

Formative Evaluations:	**Summati**
Formative Assessment with polling codeIt! Nows Quizzes Long Programs (LP)/ Lab work	Unit 1 Te

Sequence and Scope

Day	*Topic/Activities*	
1	- **String Objects** - codeIt! Now	
2	- **Immutability of Strings** - **Using Strings** - codeIt! Now	
3	- **Using Strings** - codeIt! Now	I
4	- *Lab Work: LP #1 & #2*	I
5	- *Lab Work: LP #1 & #2*	I
6	- *Quiz Question #1 and #1a* - *Lab Work: LP #1 & #2*	I

7	- **Numeric Values within Strings** - codeIt! Now	
8	- Continue **Numeric Values within Strings** - codeIt! Now	
9	- *Lab Work: LP #3*	
10	- *Lab Work: LP #3*	
11	- *Quiz Question #2* - *Lab Work: LP #3*	
12	- **Programming w/ Objects in Mind** - codeIt! Now	
13	- Continue **Programming w/ Objects in Mind** - codeIt! Now	
14	- Continue **Programming w/ Objects in Mind** - codeIt! Now	
15	- *Quiz Question #3* - *Lab Work: LP #4*	
16	- *Lab Work: LP #4*	
17	- Unit 1 Assessment	

New Jersey Student Learning Standards (NJSLS-S)

CS.9-12.8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.
CS.9-12.8.1.12.CS.2	Model interactions between application software, system software, and hardware.
CS.9-12.8.1.12.CS.3	Compare the functions of application software, system software, and hardware.
CS.9-12.CS	Computing Systems
TECH.9.4.12.CI	Creativity and Innovation
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.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.CT.3	Enlist input from a variety of stakeholders (e.g., community members, experts in the field) to design a service learning activity that addresses a local or global issue (e.g., environmental justice).

TECH.9.4.12.GCA.1	Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why some solutions (e.g., political. economic, cultural) may work better than others (e.g., SL.11-12.1., HS-ETS1-1, HS-ETS1-2, HS-ETS1-4, 6.3.12.GeoGI.1, 7.1.IH.IPERS.6, 7.1.IL.IPERS.7, 8.2.12.ETW.3). A computing system involves interaction among the user, hardware, application software, and system software. The usability, dependability, security, and accessibility of devices within integrated systems are important considerations in their design as they evolve. Successful troubleshooting of complex problems involves multiple approaches including research, analysis, reflection, interaction with peers, and drawing on past experiences. With a growth mindset, failure is an important part of success.

Interdisciplinary Connections

LA.RL.11-12	Reading Literature
LA.RL.11-12.1	Cite strong and thorough textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
LA.RL.11-12.3	Analyze the impact of the author's choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).
LA.RL.11-12.4	Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (e.g., Shakespeare as well as other authors.)
LA.RL.11-12.5	Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.
LA.L.11-12.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies.
LA.L.11-12.4.A	Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
LA.L.11-12.4.B	Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable).
LA.L.11-12.4.C	Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage.
LA.L.11-12.4.D	Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

Learning Objectives

STUDENTS WILL BE ABLE TO:

- Select and implement appropriate built in string methods to perform key tasks when writing programs
- Create strings to increase the versatility and complexity when writing programs
- Begin to program with an object-oriented paradigm in mind through the creation of user-defined methods.
- Understand the existence of variables and how they are affected through various actions throughout the structure of a program
- Use various commands from the math library in the context of a program
- Examine and debug compiler and runtime errors within programs
- Format output to a console

Suggested Activities & Best Practices

- Complete various written checkpoint exercises that focus on the explanation and description of computer hardware and Java basics.
- Develop a visual representation of the communication processes within a computer using appropriate terminology.
- Properly document a program using correct indentation, spacing, and comment style.
- Debug programs and determine the types of errors in the program.
- Create programs based on programming exercises that display various types of output using string and numeric expressions.
- -Student will be able to identify famous African Americans in the field of computer programming
- Students will also be introduced to the basic energy efficient models in the programming field to help reduce global warming

https://chortle.ccsu.edu/Java5/Notes/chap29/chap29quizRev2.html

problem-based learning: engages student learning in the context of a (broad) problem

Assessment Evidence - Checking for Understanding (CFU)

- Complete various written checkpoint exercises that focus on the explanation and description of computer basics.
- Develop a visual representation of the communication processes within a computer using appropriate ter
- Properly document a program using correct indentation, spacing, and comment style.
- Debug programs and determine the types of errors in the program.
- Create programs based on programming exercises that display various types of output using string and n
- Unit 1 Assessment
- https://chortle.ccsu.edu/Java5/Notes/chap29/chap29quizRev2.html

Formative Evaluations:	**Summat**
Formative Assessment with polling codeIt! Nows Quizzes Long Programs (LP)/ Lab work	Unit 1 Te Assessm

Alternate Assessment-Multimedia reports

Benchmark Assessment-Creat a Multimedia poster

- Admit Tickets
- Anticipation Guide
- Common Benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- DBQ's
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart

- Learning Center Activities
- Multimedia Reports
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Surveys
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit review/Test prep
- Unit tests
- Web-Based Assessments
- Written Reports

Primary Resources & Materials

NJCTL Curriculum

Curriculum development Resources/Instructional Materials/Equipment Needed Teacher Resources: • www.gliffy.com • Eclipse IDE • MS DOS Prompt • Computers

Ancillary Resources

Java Resources

- Java Review for the AP CS A Exam - Great review site with lots of practice questions.
- Aplus Compter Science Exam Review Material -Slide, Free Response, and more!
- Introduction to Java - a textbook for a first course in computer science for the next generation of scientists and engineers
- Guru-99 Introduction Java Material
- Oracles (owners of Java) has their own tutorials
- Dick Baldwin - ACC - Introduction and Advanced Java Material
- Introduction to Computer Science using Java - by Bradley Kjell

- Thinking in Java
- Blue Pelican Java
- Java Coding Bat - Lots of good practice problems
- Code Academy - No Java but good practice.

https://chortle.ccsu.edu/CS151/cs151java.html

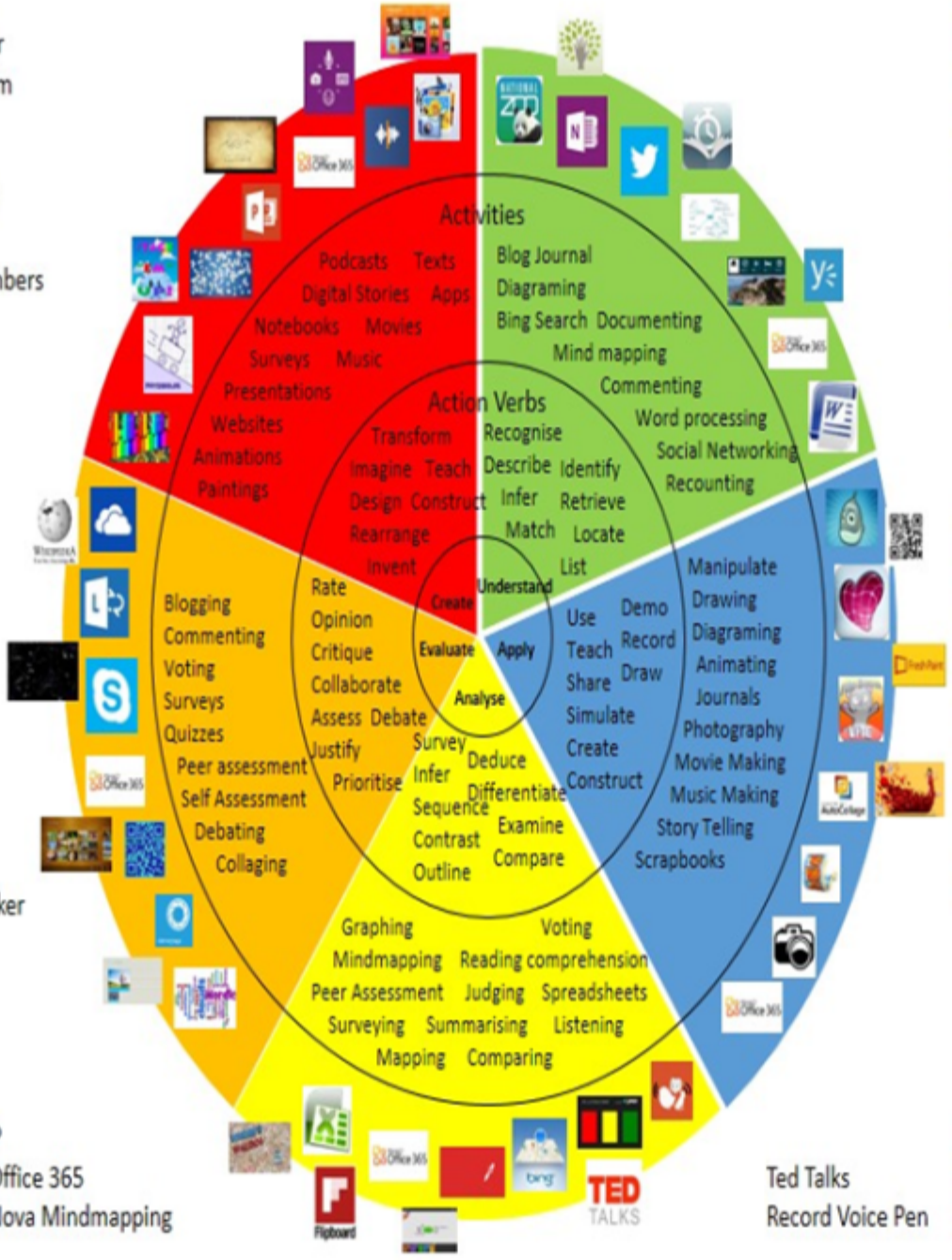
Technology Infusion

Technology Infusion and/or strategies include chromebooks online materials google/powerpoint slides

Win 8.1 Apps/Tools Pedagogy Wheel

Podcasts
Photostory 3
Kid Story Builder
Music Maker Jam
Paint A Story
Office 365
MS PowerPoint
Stack 'Em Up
NqSquared Numbers
Physamajig
Xylophone 8

Wikipedia
Skydrive
Lync
SkyMap
Skype
Office 365
Puzzle Touch
Easy QR
Memorylage
Life Moments
Word Cloud Maker



Where's Waldo?
MS Excel
Flipboard
Office 365
Nova Mindmapping

Ted Talks
Record Voice Pen

Originally taken from http://www.coetail.com/vzimmer/files/2013/02/iPadagogy-Wheel.001.jpg
And adapted for Windows 8.1 devices by Charlotte Beckhurst @CharBeckhurst

Alignment to 21st Century Skills & Technology

WRK.9.2.12.CAP	Career Awareness and Planning
WRK.9.2.12.CAP.1	Analyze unemployment rates for workers with different levels of education and how the economic, social, and political conditions of a time period are affected by a recession.
WRK.9.2.12.CAP.2	Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.
WRK.9.2.12.CAP.4	Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for achieving them, including educational/training requirements, costs, loans, and debt repayment.
WRK.9.2.12.CAP.5	Assess and modify a personal plan to support current interests and post-secondary plans.
WRK.9.2.12.CAP.6	Identify transferable skills in career choices and design alternative career plans based on those skills.
WRK.9.2.12.CAP.7	Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
TECH.9.4.12.CI	Creativity and Innovation
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).
TECH.9.4.12.CT	Critical Thinking and Problem-solving
TECH.9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.CT.3	Enlist input from a variety of stakeholders (e.g., community members, experts in the field) to design a service learning activity that addresses a local or global issue (e.g., environmental justice).
	Career planning requires purposeful planning based on research, self-knowledge, and informed choices.
	With a growth mindset, failure is an important part of success.
	Innovative ideas or innovation can lead to career opportunities.
	There are strategies to improve one's professional value and marketability.

21st Century Skills/Interdisciplinary Themes

21st century themes: The unit will integrate the 21st Century Life and career standard 9.1 strands A-D. These strands include:

critical thinking and problem solving, creativity and innovation, collaboration, teamwork, and leadership, and cross cultural understanding and interpersonal communication

21st Century/Interdisciplinary Themes that will be incorporated into this unit.

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy
- Life and Career Skills
- Media Literacy

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.12.A.CS1	Understand and use technology systems.

21st Century Skills

21st Century Skills that will be incorporated into this unit.

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

CAEP.9.2.12.C	Career Preparation
CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.

Differentiation

Exemplar:

Extra time to complete assignments: Students will be allowed to turn in work up to 6 days after the due date

• Technology Resources • • Follow all IEP Modifications/504 Plan

These are the 12 best differentiated instruction strategies to help you better meet the needs of all of your students:

1. Group students based on knowledge
2. Create pods with student captains
3. Create tiered lessons
4. Create handouts for common questions
5. Include hands-on activities and projects
6. Provide study guides, worksheets, and notes
7. Flip your classroom
8. Leverage your students' strengths
9. Practice flexible grouping
10. Offer more choices for learning
11. Think-pair-share
12. Try digital curriculum

Differentiation in a lesson lies within content, process, and/or product.

Differentiations:

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe
- Small group setting

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

Special Education Learning (IEP's & 504's)

Adapting existing materials, simplifying or supplementing materials

- **Adjust** the method of presentation or content.
- **Develop** supplemental material.
- **Provide** alternatives for responding to questions.
- **Rewrite** brief sections to lower the reading level.
- **Break** tasks into smaller subtasks.
- **Provide** additional practice to ensure mastery..
- **Develop** simple study guides to complement required materials.

Special Education Learning adaptations that will be employed in the unit, using the ones identified below.

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multi-sensory presentation
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary
- Provide modifications as dictated in the student's IEP/504 plan

- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

English Language Learning (ELL)

eDictionaries

When used correctly, technology never fails to transform a classroom. Allow your students to use eDictionaries in your classroom to look up unknown words. Any regular dictionary will do, but eDictionaries allow students to hear the pronunciations of words. As you might imagine, this is extremely helpful for anyone learning a second language. If students encounter an unknown word, they can type it into an eDictionary, hear the word pronounced and either read or listen to the definition. Also, if they aren't sure how to to spell a word, many eDictionaries will allow them to speak the word to have the correct spelling displayed.

English Language Learning adaptations that will be employed in the unit, using the ones identified below.

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required

- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

At Risk

Seating

Where are your students at risk? Hopefully, they are near a helping peer or with quick access to the teacher. Those with hearing or sight issues need to be close to the instruction which often means near the front.

Parental Involvement

Planned intervention means involving parents. Do you have an agenda in place that goes home each night? Are parents also signing the agenda or contracts you have set up? How are you involving parental support at home for homework or additional follow up?

Intervention Strategies that will be employed in this unit, using the ones identified below.

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments

- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Talented and Gifted Learning (T&G)

http://www.grandviewlibrary.org/CurriculumAdaptations/General_Gifted.pdf

Grouping • Group gifted students with other gifted students or higher-level learners. • Refrain from grouping gifted students with lower-level students for remediation.

Talented and Gifted adaptations that will be employed in this unit, using the ones identified below.

- Above grade level placement option for qualified students
- Advanced problem-solving
- Allow students to work at a faster pace
- Cluster grouping
- Complete activities aligned with above grade level text using Benchmark results
- Create a blog or social media page about their unit
- Create a plan to solve an issue presented in the class or in a text
- Debate issues with research to support arguments
- Flexible skill grouping within a class or across grade level for rigor
- Higher order, critical & creative thinking skills, and discovery
- Multi-disciplinary unit and/or project
- Teacher-selected instructional strategies that are focused to provide challenge, engagement, and growth opportunities
- Utilize exploratory connections to higher-grade concepts
- Utilize project-based learning for greater depth of knowledge

Sample Lesson

https://runestone.academy/runestone/books/published/csawesome/Unit2-Using-Objects/topic-2-6-strings.html?highlight=strings

Lesson Plan – Strings

Teacher:	Corey Woodring	Time Frame:	17 days
Grade:	9-12	School:	Belleville High School
Subject:	AP Computer Science A		

(What questions will the student be able to answer as a result of the instruction?)

1. How are characters and string objects used in programs?
2. How can we write and compare string objects?
3. How do the games we play simulate randomness?
4. How can we cast between a character, string, and numeric data type?
5. How can we work with the string data type to: determine its length, obtain a character, concatenate strings, and compare strings?
6. How is programming with object-orientation in mind different than the top-to-bottom approach?

Assessment

(What is acceptable evidence to show desired results (rubrics, exam, etc.)? Attach Copy

- Complete various written checkpoint exercises that focus on the explanation and description of computer hardware and Java basics.
- Develop a visual representation of the communication processes within a computer using appropriate terminology.
- Properly document a program using correct indentation, spacing, and comment style.
- Debug programs and determine the types of errors in the program.
- Create programs based on programming exercises that display various types of output using string and numeric expressions.
- Unit 3 Assessment

Formative Evaluations:

Formative Assessment with polling

codeIt! Nows

Quizzes

AP Classroom AP Computer Science A Topic Questions

Long Programs (LP)/ Lab work

Summative Evaluations:

Unit 3 Test/ReTest

AP Classroom AP Computer Science A Progress Checks

Sequence and Scope

Day	Topic/Activities	CW-HW
1	• String Objects • codeIt! Now	Problems #1 - 7

2	• Immutability of Strings • Using Strings • codeIt! Now	Problems #8 - 14
3	• Using Strings • codeIt! Now	Problems #15 – 19, AP Classroom topic questions 2.6 – 2.7
4	• Lab Work: LP #1 & #2	Problems #20 - 25
5	• Lab Work: LP #1 & #2	Problems #26 - 27
6	• Quiz Question #1 and #1a • Lab Work: LP #1 & #2	Problems #26 - 27
7	• Numeric Values within Strings • codeIt! Now	Finish codeIt!
8	• Continue Numeric Values within Strings • codeIt! Now	Problems #28, AP Classroom topic questions 4.3
9	• Lab Work: LP #3	Problems #28
10	• Lab Work: LP #3	Problems #29
11	• Quiz Question #2 • Lab Work: LP #3	Problems #29
12	• Programming w/ Objects in Mind • codeIt! Now	Finish codeIt!
13	• Continue Programming w/ Objects in Mind • codeIt! Now	Finish codeIt!
14	• Continue Programming w/ Objects in Mind • codeIt! Now	Problems #30
15	• Quiz Question #3 • Lab Work: LP #4	Study for Test

16	• Lab Work: LP #4	Study for Test
17	• Unit 3 Assessment	None

CS.9-12.8.1.12.CS.1	Describe ways in which integrated systems hide underlying implementation details to simplify user experiences.
CS.9-12.8.1.12.CS.2	Model interactions between application software, system software, and hardware.
CS.9-12.8.1.12.CS.3	Compare the functions of application software, system software, and hardware.
CS.9-12.8.1.12.CS.4	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.
CS.9-12.CS	Computing Systems
CS.9-12.NI	Networks and the Internet
TECH.9.4.12.CI	Creativity and Innovation
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).
TECH.9.4.12.CT	Critical Thinking and Problem-solving
TECH.9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.GCA.1	Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why some solutions (e.g., political. economic, cultural) may work better than others (e.g., SL.11-12.1., HS-ETS1-1, HS-ETS1-2, HS-ETS1-4, 6.3.12.GeoGI.1, 7.1.IH.IPERS.6, 7.1.IL.IPERS.7, 8.2.12.ETW.3).
	The usability, dependability, security, and accessibility of devices within integrated systems are important considerations in their design as they evolve.
	A computing system involves interaction among the user, hardware, application software, and system software.
	Innovative ideas or innovation can lead to career opportunities.
	Successful troubleshooting of complex problems involves multiple approaches including research, analysis, reflection, interaction with peers, and drawing on past experiences.
	With a growth mindset, failure is an important part of success.