Creative Development (10–13%)
Big Idea #1 ↓

- *Computing innovations:* an innovation that uses a program as a key part of their function.

Computing Innovation Samples:
- Physical: Robots, Tablets, & Smart technology
- Not Physical: Social Media, Applications, Editing Software, & Video Games
- **Collaboration** is integral to CS because it allows for diverse ideas and thoughts that cater towards different people.
- *Pair programming* is when two people share a computer and take turns coding.
- **Logic Errors:** unexpected behavior in program's output
- **Syntax Errors:** the code does not work properly because it is typed or written incorrectly
- **Run-Time Errors:** error occurs while code runs
- **Overflow Errors:** the numbers are too big for the computer
- *iterative development process*: develop working prototypes of a program and go back through the cycle to redevelop the program
- **incremental development process**: break a problem into small parts and then reassemble the solution when each party is fixed
- **waterfall development model:**. a step-by-step process where each step flows into another.

Data (17–22%)
Big Idea #2 ↓

- **Data** is a collection of numbers and facts from different sources
- **Bits** (binary digits) are what computers store data in
- Computers read **machine code** which is usually in the **binary system.**
- You must convert numbers between bases quickly for the MCQS
- 8 bits = 1 byte
- **Hexadecimal** is used for RGB color codes & it uses numbers & letters to represent values
- **ASCII code** converts text to binary format
- **Abstraction:** reduces complexity by only focusing on the most important parts & hiding the irrelevant parts from the user.
- **Analog data** is measured continuously & change smoothly
- **Digital data** is measured digitally and leaves out extra data by simplifying the data collected (form of abstraction)
- **Data compression** is dependent on 1) the method used and 2) the amount of repeated info in the data
- **Lossless compression:** less compression & better file quality
- **Lossy compression**: more compression & worse file quality
- **Metadata:** data about data
- **Data mining:** examining very large data sets to find information
- **Transforming data:** editing or modifying data

Algorithms & Programming (30–35%)
Big Idea #3 ↓

- **pseudocode:** will be used a lot on the MCQ section of the AP Exam, make sure to review the AP CSP exam sheet and fully understand all of the pseudocode.
- AP pseudocode has an index that starts are 1
- **Loops** traverse through lists/arrays/strings
- **Data types:** integers, strings, lists and booleans
- **List (array)** an ordered sequence of element
- **Strings** are an ordered list of characters
    - **Substrings** are part of a string
- **String concatenation** occurs when two strings or more are connected w/ a "+"
- **An algorithm** has instructions that accomplish a task or solve a problem
- All algorithms are created using **sequencing, selection, and iteration**
- **Sequencing** means that all of the code is executed in the order they are written in.
- **Expression** a statement that only returns one value. (Evaluated with PEMDAS)
- **Selection** statements are processed through **if statements** that all have **conditions** that need to be met for the selection to run
- **Else statements** are attached to if statements which specify what happens if a condition is not met
- **MOD (%)** gives you the remainder of 2 #'s
- **Nested conditional statements** have conditional statements inside of conditional statements
- **Procedures** are programming instructions that are also called **methods** or **functions**
- **Parameters:** input variables of a procedure
- **Arguments:** a call with defined values + attributes
- **logical operators**: NOT, AND and OR
- **An element** is an individual value in a list & all elements have an **index**

Computer Systems & Networks (11–15%)
Big Idea #4 ↓

- **sequential computing:** traditional programming where each program is processed at a time
- **Parallel computing:** when program is broken into smaller operations and processed at the same time using multiple processors
- **Distributed computing:** multiple devices communicate together to run a program
- **sequential solution:** takes as long as the # of all steps in a program
- **parallel computing solution:** faster w less # of cores
- **fault tolerant:** something can still function even w/ a partial malfunction
- **Redundancy:** duplication of things
- **Internet = inter**connection and **net**works
- **computer network** is when multiple computing devices communicate with each other
- Data on the internet is split into **data packets**
- **Routing:** the process of finding the best path to deliver information.

Impact of Computing (21–26%)
Big Idea #5 ↓

- **digital divide**: gaps between those who have access to the internet and those who do not
- The things that affect this are demographics, socioeconomic status, and geographic location
- **intellectual property** the work that people consider "theirs"
- **Copyright:** the person who created something determines who uses their creation
- **Creative Commons**: copyright license for creators to give others the ability to use their work
- **Open-sourcing**: work is freely shared, distributed, and modified
- **Open access**: research available to public w/ out restrictions
- **Malware**: malicious software that takes control of a system
- **Phishing:** tricks ppl into giving their personal information away
- **Encryption:** encoding data to prevent others from accessing it
- **Symmetric key encryption** one key for both encrypting & decrypting
- **Public key encryption** public key to encrypt & private key to decrypt

MCQ Tips

- **120 minutes (2 hrs) | 70 multiple choice questions | 70% of AP Exam Score**
- Pace yourself! You have around 1.7 minutes for each question so make sure to keep track of the time.
- If you are confused on a question, ***skip and come back later***. If you cannot understand a question within 5-10 seconds of reading it, try to answer other questions first.
- If necessary, ***guess***. CollegeBoard does not have a guessing penalty (points are only rewarded if earned, not taken away if answered incorrectly.
- Read the AP CSP ***reference sheet*** ahead of time for easy use on the AP Exam.
- Find and use practice questions! ***Practice makes perfect!***

Create Task Tips

- **12+ hours in class work time | 30% of AP Exam Score | DUE: May 20th, 2021 @ 11:59 PM EDT**
- Work ahead of time! Try to avoid submitting your Create Task late to avoid technical errors.
- Before submitting, review the *scoring guidelines* on the CollegeBoard website to make sure you have fulfilled the requirements for each row on the rubric.
- To make sure your Create Task is completed properly, view the *sample responses* on the College Board Website and cross reference and compare your work to the samples.
- Any examples or samples you see, write down to make sure you do not accidentally plagiarize. A Create Task that is flagged for plagiarism will receive a score of 0.
- Be confident in your work! You have gone through this class for an entire year & are prepared!