Weekly Planner: AP CSP week of 1.20.20

BIG IDEA for the week:

3- DATA AND INFORMATION

Day	
Mon	MLK day: **The time is always right to do what is right.** **~Martin Luther King, Jr.** Courtesy: https://www.brainyquote.com/authors/martin-luther-king-jr-quotes
Tues	NEW TEAMS!!!!! -Warm UP- color picker and Hexadecimal -Introduce Socraevic questioning -Go over Code.org test from Friday HW= FINISH test with REASONING..explain HOW to solve the question, read B2B, -KWL chart pg 26,
Wed	-Warm up: The internet is for everyone U1 L8 and 9 Bits to IP address example HW= finish battleship game with your team, do code.org questions and HW on schoology due tonight or prior to class. Abstraction: https://www.youtube.com/watch?v=_y-5nZAbgt4
Thurs	**-Warm up** **Warriors of the net:** https://www.youtube.com/watch?v=EOYe71RWMvk **IP addresses and DNS** **https://www.youtube.com/watch?v=5o8CwafCxnU&feature=youtu.be** **Packets, Routing, and Reliability** **https://www.youtube.com/watch?v=AYdF7b3nMto&feature=youtu.be** **The Internet: HTTP and HTML** **https://www.youtube.com/watch?v=kBXQZMmiA4s&feature=youtu.be** **U1L10-11 Code.org and HW on schoology.**

Friday	CATCH-UP DAY UNIT 1 TEST MOVED TO MONDAY 😊

Warm up activities!

Monday 1.20.20-

https://evansccca.weebly.com/

MLK day: The time is always right to do what is right.
~Martin Luther King, Jr.
https://www.flippity.net/rp.asp?k=12CjhCA0jTq2jUcyMPs_W44wjadnS8YRDn-2paoY9M0s

Tuesday 1.21.20-

1. Google Color Picker: Describe how colors are "numbered" for a computer.
2. Find your favorite color and write down the HEX number that goes with it. THEN SHOW WORK TO CONVERT IT!!!

https://www.w3schools.com/colors/colors_picker.asp?color=%23ffab00

Wednesday 1.22.20-

"The internet is for everyone."

Thursday 1.23.20-

https://www.youtube.com/watch?v=EOYe71RWMvk warriors of the net
Name, Role/what it does, How it works,
What could go wrong?

Your chart on back

Warm up 2/24/2020 Convert 131_{10} to hexadecimal.
Then make two "nibbles" from each HEX place value.

Friday 1.24.19-

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AP CSP Note sheet: 1/23/2020 NAME_____

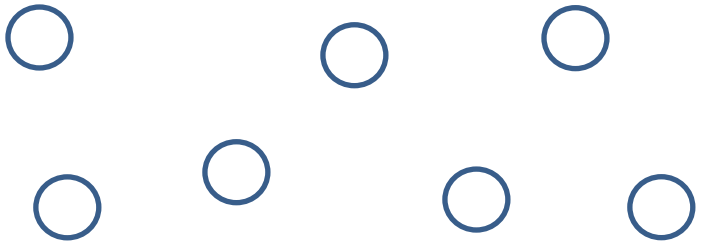
IETF = anybody

Packets: A **packet** is the unit of data that is routed between an origin and a destination on the Internet or any other **packet**-switched network. On TCP, Packets can get dropped.

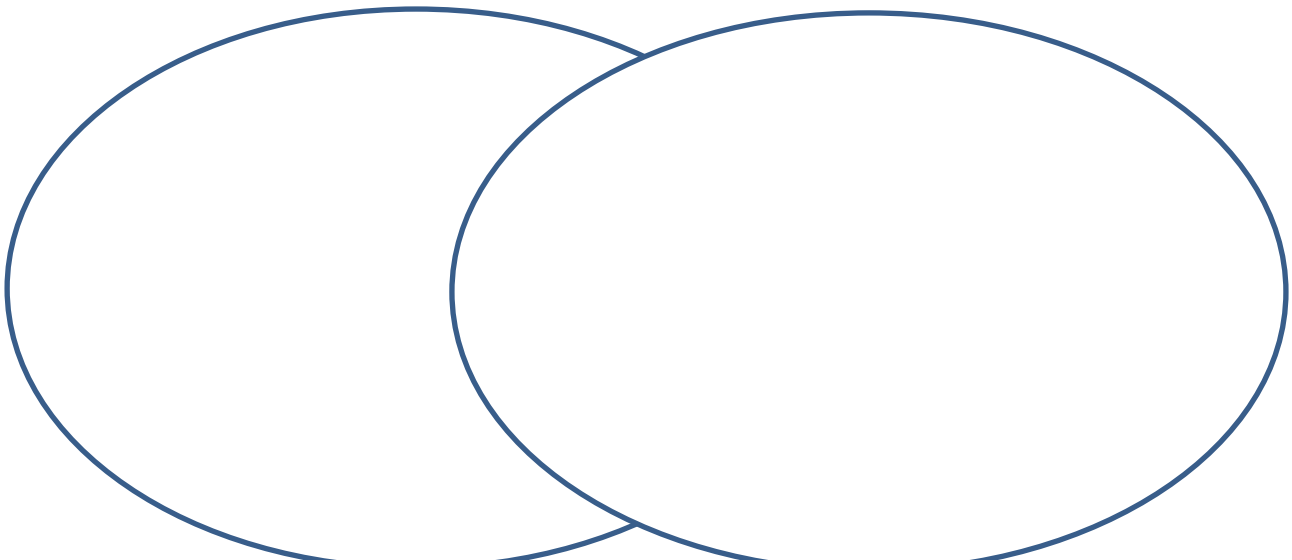
TCP/IP: HIGH LEVEL network protocols that rely on the lower level ones to function seamlessly.

Routers: Act independently and route packets as they see fit.

Sending packets:



IPV4 vs IPV6:



DNS: Domain name System

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HTTP: **HTTP** means HyperText Transfer Protocol. **HTTP** is the underlying protocol used by the World Wide Web and this protocol defines how messages are formatted and transmitted, and what actions Web servers and browsers should take in response to various commands.

TCP is in charge of setting up a reliable connection between two machines **and HTTP** uses this connection to transfer data between the server **and** the client. **HTTP** is used for transferring data while **TCP** is in charge of setting up a connection which should be used by **HTTP** in the communication process.

Low Level Protocols vs. High Level protocols High-**level protocols** deal with the formatting of data. TCP (transmission control **protocol**) and IP (Internet **protocol**) are **examples** of high-**level** network **protocols.**

ABSTRACTION IN COMPUTING:

the process of removing physical, spatial, or temporal details[2] or attributes in the study of objects or systems to focus attention on details of greater importance;[3] it is similar in nature to the process of generalization;

Abstractions may also refer to real-world objects and systems, rules of computational systems or rules of programming

languages that carry or utilize features of abstraction itself, such as:

U1L 2-7 homework:

1) Complete the reflection (one short paragraph) at the end of Unit 1 Lesson 2 in code.org. (Remember - I can see what you write!)

2) Complete the following and copy then upload it into the create part of submission for U1L1:
Name _____ **Date** _____ **AP CSP** **U1 L2 HW**

Sending Binary Messages

Directions: *Type your responses below and upload your document to our schoology Classroom. "One Paragraph" means 4-6 sentences.*

1. A binary question is defined as:
   (A) A piece of information that is sent in pairs
   (B) Two questions which share the same answer
   (C) A message which can be in two possible states
   (D) A question which can be answered in only one of two possible ways

2. Provide an example of a question that could not be answered with a binary message. Explain why this is the case, in one paragraph, making reference to the definition of a binary message.

3. Modify your question so that it could be answered with a binary message. Explain in one paragraph why it can now be answered with a binary message.

4. Can you send a message in binary to someone you've never before communicated with? If yes, how? If no, what does the person receiving a message need to know in order to successfully decode the message? Explain in one paragraph.

U1L3 ***Directions:*** *Type your responses below and upload your document to our schoology assignment. "One Paragraph" means 4-6 sentences.*

READ the following:

https://www.howtogeek.com/138771/htg-explains-how-latency-can-make-even-fast-internet-connections-feel-slow/

https://www.highspeedinternet.com/resources/bandwidth-vs-latency-what-is-the-difference/

1) Describe latency and explain the units for it.

2) Describe bandwidth and explain the units for it.

3) Explain what is meant when someone says "Data is transferred at low latency".

4. Explain what is meant when someone says "High Bandwidth".

U1L4

Directions: *Type your responses below and upload your document to our schoology Classroom. "One Paragraph" means 5-7 sentences.*

1. Research on your own: In the binary number system, can we represent negative numbers? If so, how? Explain in a paragraph using an example.

2. Explain the Roman Numeral system in a paragraph (research it if you don't know). Give an example of a Roman Numeral and explain how to convert it to Decimal.

3. Can we represent 0 or negative numbers in the Roman Numeral System ? (Research it if you don't know!)

4. Explain how the "Octal System" works in one paragraph. Use the given diagram or research it to help you explain.

Decimal Base-10	Binary Base-2	Octal Base-8	Hexa Decimal Base-16
0	0	0	0
1	1	1	1
2	10	2	2
3	11	3	3
4	100	4	4
5	101	5	5
6	110	6	6
7	111	7	7
8	1000	10	8
9	1001	11	9
10	1010	12	A
11	1011	13	B
12	1100	14	C
13	1101	15	D
14	1110	16	E
15	1111	17	F
16	10000	20	10

5. Explain in a paragraph how the "Hexadecimal System" works. Research it and/or use the diagram in #4.

U1L5 HW

https://www.youtube.com/watch?v=rsxT4FfRBaM

https://youtu.be/USCBCmwMCDA

1-10)

Convert of your own decimal #'s into binary then 5 of your own different binary #'s into decimal.

11. A web store uses 7-bit binary sequences to identify each unique item for sale. The store plans to increase the number of items it sells and is considering using 8-bit binary sequences. Which of the following best describes the result of using 8-bit sequences instead of 7-bit sequences?

a. 2 more items can be uniquely identified.
b. 10 more items can be uniquely identified.
c. 2 times as many items can be uniquely identified.
d. 10 times as many items can be uniquely identified.

12. Which of the following can be represented by a single binary digit? **Select TWO**.

a. The volume of a radio speaker
b. The remainder when dividing an integer by 2
c. The value of a Boolean variable
d. The position of the minute hour hand of a clock

U1L6 HW

Name _____ **Date** _____ **AP CSP U1 L6 HW**

Sending Numbers

Directions: *Type your responses below and upload your document to our Schoology Classroom. "One Paragraph" means 5-7 sentences.*

1. Write a protocol that allows the user to send a calendar date (mm/dd). What is the minimum number of bits necessary for your protocol?

2. Write a protocol that allows the user to send a time (use 24-hour military time hh:mm:ss). What is the minimum number of bits necessary for your protocol?

3. Write a protocol designed for a graph that is not square (for example, 50 by 200). How does this alter the protocol you wrote in class today for your protocol?

4. Write your own protocol that can communicate locations on the surface of the earth, using longitude and latitude. For example, Galveston Island, Texas, USA, is located at 29 degrees, 16 minutes, and 22 seconds north of the equator, and 94 degrees, 49 minutes and 46 seconds west of the Prime Meridian.

5. Using the phrase, SPEAR AND PEPPER, with no spaces, follow the given protocol. Fill in each blank space to see the phrase transform into it's

SPEARANDPEPPER (courtesy of https://jumblesolver.me/solve)

Switch the fourth consonant with the third letter. _____

Insert a W at the exact center of the row. _____
Double the first letter. _____

Delete the last vowel. _____

Change the eleventh letter to an M._____

Add an I at the left end of the row. _____

Move the consonant that comes earliest in the alphabet to the right end of the row. _____

Delete the first P. _____

Move the first consonant to the right end of the row. _____

Delete all A's. _____

Move the central letter to the left end of the row. _____

Switch the ninth letter with the first S. _____

Change the first E to an O, and delete the remaining E. _____

Change the second P to a T. _____

Delete the fourth consonant. _____

Repeat step h. _____

Reverse the order of the middle four letters. _____

------____---___---___---___---___

Name _____ **Date** _____ **AP CSP U1 L7 HW**
Sending Text

Directions: *Type your responses below and upload your document to our Schoology Classroom. "One Paragraph" means 5-7 sentences.*

1. ASCII is a character-encoding scheme that uses 7 bits to represent each character. The decimal (base10) values 65 through 90 represent the capital letters A through Z as shown in the table below.

Decimal	ASCII Character
65	A
66	B
67	C
68	D
69	E
70	F
71	G
72	H
73	I
74	J
75	K
76	L
77	M

Decimal	ASCII Character
78	N
79	O
80	P
81	Q
82	R
83	S
84	T
85	U
86	V
87	W
88	X
89	Y
90	Z

   What ASCII character is represented by the binary number 101 1001?

ASCII printable characters					
32	space	64	@	96	`
33	!	65	A	97	a
34	"	66	B	98	b
35	#	67	C	99	c
36	$	68	D	100	d
37	%	69	E	101	e
38	&	70	F	102	f
39	'	71	G	103	g
40	(	72	H	104	h
41	)	73	I	105	i
42	*	74	J	106	j
43	+	75	K	107	k
44	,	76	L	108	l
45	-	77	M	109	m
46	.	78	N	110	n
47	/	79	O	111	o
48	0	80	P	112	p
49	1	81	Q	113	q
50	2	82	R	114	r
51	3	83	S	115	s
52	4	84	T	116	t
53	5	85	U	117	u
54	6	86	V	118	v
55	7	87	W	119	w
56	8	88	X	120	x
57	9	89	Y	121	y
58	:	90	Z	122	z
59	;	91	[	123	{
60	<	92	\	124	|
61	=	93	]	125	}
62	>	94	^	126	~
63	?	95	_		

2. ASCII is a character-encoding scheme that uses 7 bits to represent each character. The decimal (base10) values 32 through 64 represent keyboard symbols and numbers, as shown in the table to the right.

What ASCII character is represented by the binary number 010 0110?

3. Joe and Cayla want to send formatted text through the internet simulator. They use the following protocol:

U() means the text is underlined.

I() means the text is Italicized.

B() means the text is bold.

All words in the parentheses have the formatting listed above. For example, B(phone) means the word “phone” is in bold.

There is a space between each word.

Joe sends the following message: U(Text B(me)) I(later).

Which of the following is his message?

a. Text **me** *later.*

b. Text **me** *later.*

c. Text me *later.*

d. Text **me** *later.*

7 BIG ideas

Big Idea 1: Creativity

Computing is a creative activity. Creativity and computing are prominent forces in innovation; the innovations enabled by computing have had and will continue to have far-reaching impact. At the same time, computing facilitates exploration and the creation of computational artifacts and new knowledge that help people solve personal, societal, and global problems. This course emphasizes the creative aspects of computing. Students in this course use the tools and techniques of computer science to create interesting and relevant artifacts with characteristics that are enhanced by computation.

Essential Questions:

- How can a creative development process affect the creation of computational artifacts?
- How can computing and the use of computational tools foster creative expression?
- How can computing extend traditional forms of human expression and experience?

Big Idea 2: Abstraction

Abstraction reduces information and detail to facilitate focus on relevant concepts. Everyone uses abstraction on a daily basis to effectively manage complexity. In computer science, abstraction is a central problem-solving technique. It is a process, a strategy, and the result of reducing detail to focus on concepts relevant to understanding and solving problems. This course requires students to use abstractions to model the world and communicate with people as well as with machines. Students in this course learn to work with multiple levels of abstraction while engaging with computational problems and systems; use models and simulations that simplify complex topics in graphical, textual, and tabular formats; and use snapshots of models and simulation outputs to understand how data changes, identify patterns, and recognize abstractions.

Essential Questions:

- How are vastly different kinds of data, physical phenomena, and mathematical concepts represented on a computer?
- How does abstraction help us in writing programs, creating computational artifacts, and solving problems?
- How can computational models and simulations help generate new understanding and knowledge?

Big Idea 3: Data and Information

Data and information facilitate the creation of knowledge. Computing enables and empowers new methods of information processing, driving monumental change across many disciplines — from art to business to science. Managing and interpreting an overwhelming amount of raw data is part of the foundation of our information society and economy. People use computers and computation to translate, process, and visualize raw data and to create information. Computation and computer science facilitate and enable new understanding of data and information that contributes knowledge to the world. Students in this course work with data using a variety of computational tools and techniques to better understand the many ways in which data is transformed into information and knowledge.

Essential Questions:

- How can computation be employed to help people process data and information to gain insight and knowledge?
- How can computation be employed to facilitate exploration and discovery when working with data?
- What considerations and trade-offs arise in the computational manipulation of data?
- What opportunities do large data sets provide for solving problems and creating knowledge?

Big Idea 4: Algorithms

Algorithms are used to develop and express solutions to computational problems. Algorithms are fundamental to even the most basic everyday task. Algorithms realized in software have affected the world in profound and lasting ways. Secure data transmission and quick access to large amounts of relevant information are made possible through the implementation of algorithms. The development, use, and analysis of algorithms are some of the most fundamental aspects of computing. Students in this course work with algorithms in many ways: they develop and express original algorithms, they implement algorithms in a language, and they analyze algorithms analytically and empirically.

Essential Questions:

- How are algorithms implemented and executed on computers and computational devices?
- Why are some languages better than others when used to implement algorithms?
- What kinds of problems are easy, what kinds are difficult, and what kinds are impossible to solve algorithmically?
- How are algorithms evaluated?

Big Idea 5: Programming

Programming enables problem solving, human expression, and creation of knowledge. Programming and the creation of software has changed our lives. Programming results in the creation of software, and it facilitates the creation of computational artifacts, including music, images, and visualizations. In this course, programming enables exploration and is the object of study. This course introduces students to the concepts and techniques related to writing programs, developing software, and using software effectively. The particular programming language is selected based on appropriateness for a specific project or problem. The course acquaints students with fundamental concepts of programming that can be applied across a variety of projects and languages. As students learn language specifics for a given programming language, they create programs, translating human intention into computational artifacts.

Essential Questions:

- How are programs developed to help people, organizations, or society solve problems?
- How are programs used for creative expression, to satisfy personal curiosity, or to create new knowledge?
- How do computer programs implement algorithms?
- How does abstraction make the development of computer programs possible?
- How do people develop and test computer programs?
- Which mathematical and logical concepts are fundamental to computer programming?

Big Idea 6: The Internet

The Internet pervades modern computing. The Internet and the systems built on it have had a profound impact on society. Computer networks support communication and collaboration. The principles of systems and networks that helped enable the Internet are also critical in the implementation of computational solutions. Students in this course gain insight into how the Internet operates, study characteristics of the Internet and systems built on it, and analyze important concerns such as cybersecurity.

Essential Questions:

- What is the Internet? How is it built? How does it function?
- What aspects of the Internet's design and development have helped it scale and flourish?
- How is cybersecurity impacting the ever-increasing number of Internet users?

Big Idea 7: Global Impact

Computing has global impact. Computation has changed the way people think, work, live, and play. Our methods for communicating, collaborating, problem solving, and doing business have changed and are changing due to computing innovations, which are innovations that include a computer or program code as an integral part of their function. Many innovations in other fields are fostered by advances in computing. Computational approaches lead to new understandings, new discoveries, and new disciplines. Students in this course become familiar with many ways in which computing enables innovation, and they analyze the potential benefits and harmful effects of computing in a number of contexts.

Essential Questions:

- How does computing enhance human communication, interaction, and cognition?
- How does computing enable innovation?
- What are some potential beneficial and harmful effects of computing?
- How do economic, social, and cultural contexts influence innovation and the use of computing?