| Invitation to Computer Science | Chapter 1 | Name: _____ |
|---|---|---|

## Key Terms

Computer Science:

Sequential Operations:

Conditional Operations:

Iterative Operations:

Algorithm:

Unambiguous Operation:

## Key Ideas

Misconceptions of computer science:

Who is considered as the first computer programmer?

## Reflection/Notes/Questions

Think of some algorithms you use every day and list them here:

Thoughts/notes from chapter 1:

| CS50 AP Unit 0 | Module: 0 - Computers & Computing | Name: _____ |
|---|---|---|

## Key Terms

Computer:

Computing:

Input:

Output:

Programming:

Computations Process:

Hardware:

Software:

Operating System:

CPU:

## Key Ideas

What characteristics define a computer?

Do computers necessarily need electricity to be considered computers?

## Reflection/Notes/Questions

Think specifically about passive computing. What types of things might you do that don't involve you actively using a computer, but still might be considered computing.

Is it still considered computing if you get the wrong answer? What are the essential components of computing and computation?

Thoughts/notes from module 0:

| CS50 AP Unit 0 | Module: 1 - How Computers Work | Name: _____ |
|---|---|---|

## Key Terms

Bit:

RAM:

HDD:

SSD:

Peripherals:

Bus:

Heatsink:

## Key Ideas

How is it that your computer knows to display words on your screen instead of playing music?

What are some of the common ports on computers and what do they do?

What is the key thing that the operating system (OS) does for you?

## Reflection/Notes/Questions

Are there different layers of hardware? What makes up these layers, and how do they interact?

Thoughts/notes from module 1:

| CS50 AP Unit 0 | Module: 2 - Binary and ASCII | Name: _____ |
|---|---|---|

## Key Terms

Binary:

Decimal:

ASCII:

## Key Ideas

What is the number system that your computer uses?

## Reflection/Notes/Questions

Think about the ASCII table, in particular some of the patterns in it. How might some of those patterns be helpful?

Thoughts/notes from module 2:

| CS50 AP Unit 0 | Module: 2 - Binary and ASCII | Name: _____ |
|---|---|---|

# Practice Problems – Binary

**Convert the given Decimal number to its Binary equivalent.**

1) $7_{(10)}$ = _____ (2)

2) $11_{(10)}$ = _____ (2)

3) $2_{(10)}$ = _____ (2)

4) $14_{(10)}$ = _____ (2)

5) $0_{(10)}$ = _____ (2)

6) $4_{(10)}$ = _____ (2)

7) $9_{(10)}$ = _____ (2)

8) $5_{(10)}$ = _____ (2)

**Convert the given Binary to its Decimal equivalent.**

9) $0001_{(2)}$ = _____ (10)

10) $1010_{(2)}$ = _____ (10)

11) $1111_{(2)}$ = _____ (10)

12) $0011_{(2)}$ = _____ (10)

13) $0110_{(2)}$ = _____ (10)

14) $1000_{(2)}$ = _____ (10)

15) $1100_{(2)}$ = _____ (10)

16) $1101_{(2)}$ = _____ (10)

| CS50 AP Unit 0 | Module: 2 - Binary and ASCII | Name: _____ |
|---|---|---|

# Practice Problems – Binary

**Convert the given Decimal number to its Binary equivalent.**

1) $78_{(10)}$ = _____ (2)

2) $66_{(10)}$ = _____ (2)

3) $187_{(10)}$ = _____ (2)

4) $208_{(10)}$ = _____ (2)

5) $151_{(10)}$ = _____ (2)

6) $212_{(10)}$ = _____ (2)

7) $166_{(10)}$ = _____ (2)

8) $91_{(10)}$ = _____ (2)

**Convert the given Binary to its Decimal equivalent.**

9) $11110001_{(2)}$ = _____ (10)

10) $1110010_{(2)}$ = _____ (10)

11) $10101111_{(2)}$ = _____ (10)

12) $11110011_{(2)}$ = _____ (10)

13) $10110110_{(2)}$ = _____ (10)

14) $11101100_{(2)}$ = _____ (10)

15) $10111111_{(2)}$ = _____ (10)

16) $10011101_{(2)}$ = _____ (10)

| CS50 AP Unit 0 | Module: 2 - Binary and ASCII | Name: _____ |
|---|---|---|

## Practice Problems – ASCII

1. Use an ASCII Table to decode the following message:

   83, 116, 101, 119, 97, 114, 116, 32, 105, 115, 32, 116, 104, 101, 32, 99, 111, 111, 108, 101, 115, 116, 33

2. Encode your first and last name in ASCII

3. Convert the following numbers to decimal, then use the ASCII table to determine the letters they represent:

   01010011

   01101000

   01101001

   01110000

| CS50 AP Unit 0 | Module: 3 - Logic and Processors | Name: _____ |
|---|---|---|

## Key Terms

Transistor:

Semiconductor:

True:

False:

Boolean Logic:

Core:

Hyperthreading:

Motherboard:

SoC:

## Key Ideas

In Boolean logic, how are the values represented?
What are the relative voltages that go along with those values?

What are the 3 main types of gates/circuits?

## Reflection/Notes/Questions

What is Moore's law and how does it affect computer science? (you may have to search online for this answer)

Thoughts/notes from module 3:

| CS50 AP Unit 0 | Module: 4 - Memory | Name: _____ |
|---|---|---|

## Key Terms

Memory:

Cache:

Volatile:

Non-volatile:

## Key Ideas

What is the largest type of memory?
Smallest?

How much memory does a 32-bit CPU have?
64-bit?

## Reflection/Notes/Questions

What are some of the tradeoffs when considering types of memory?

Through all of this unit, you have probably heard a lot about abstraction; what exactly is abstraction?

Thoughts/notes from module 4: