Things to learn (list from chapter 3):

1. Motherboard parts
2. Processor (CPU) functions
3. Upgrading/Replacing motherboard and processor
4. GPUs
5. How to add parts to computers
6. How to add cards to computers
7. Differences between PCI, PCI-X, AGP, PCIe adapters and slots
8. Motherboard tech such as Hypertransport, Hyper-Threading, and multi-core
9. “The benefits of active listening” (?)

Things to write about in journal:

1. Processor Overview
2. Processor Basics
3. Cache
4. Clocking
5. Graphics Processing Unit (GPU)
6. Processor Cooling
7. Chipsets

***Note from Elijah:***

***I didn’t want to spend more time making things look good so I turned in what I had***

Notes:

1) Processor Overview/Basics:

* CPU Socket
  + Definition: The socket that a CPU is inserted into
  + LGA: “Land Grid Array”
    - LGA sockets have hundreds of pins sticking up
    - LGA CPUs have no pins, back is completely flat
  + ZIF: “Zero Insertion Force”
    - ZIF sockets have a bunch of holes
    - ZIF CPUs have a bunch of pins
  + PGA (?)
  + [“Socket types aren’t as important to know as matching correct type of socket to the correct type of motherboard”](https://www.techjunkie.com/know-cpu-sockets/#2_Main_Types)
* CPU/Central Processing Unit
  + Have various speeds, measured in GHz (gigahertz)
  + Hz measures cycles per second
  + 1 Hz = 1 cycle per second
  + 1 GHz = 1 billion cycles per second
  + Register size/Word size = Number of bits processed at one time
    - Modern CPUs have register sizes of 64 or 128 bits
* Bus
  + The connections between all components on the motherboard
  + Historically, the components used to be large and were individual, physically separated objects. The wires in-between them were called the bus wires.

2) Cache

* Holds data until the cpu needs to use it (similar to RAM)
* Very fast
* L1 cache is inside the cpu
* L2 cache is outside the cpu but “inside the chip” (????)
* L3 cache is not supported by all processors (????)

3) Clocking

* (????) I have a vague understanding of clock speed. I cannot feel confident in writing any notes about it, because It’s difficult for me to visualize and I do not know what different speeds can affect.

4) Graphics Processing Unit (GPU)

* iGPU/IGP = Integrated GPU
* CPUs contain several large core processors, GPUs contains hundreds of smaller core processors
* Some GPUs can improve performance for non-graphics related tasks. These are called general-purpose GPUs (GPGPUs)
  + Integrated GPUs share part of the motherboard RAM or dedicate a separate “block” to video
* Computers can have multiple GPUs
* Cores: A computer with 4 CPUs and 2 GPUs has 6 cores

5) Processor Cooling:

* A CPU should never be turned on without proper cooling
* The model number of a CPU is often covered up by cooling devices
* CPUs often don’t run at maximum speed to stay cooler
* AMD and Intel have functions that reduce heat by disabling unused parts of the CPU and slowing the CPU down when it gets hot
* Methods of Cooling:
  + Heat Sink
    - I know *very well* what this is, having seen them many times in the past (such as on my old RC car). However, I don’t really know how to explain them clearly. They are groups of metal “slabs” connected to parts which get heated easily, and absorb their heat to cool them.
  + Fan
    - It’s… a fan
  + Thermal Paste/Thermal Fan
    - (???? Functions like lubrication for connected cooling devices?)
  + Liquid Cooling
    - Liquid circulates throughout the system (like a mini fridge or car’s intercooler)
    - Liquid passes the heat sink, absorbing and carrying heat away
    - Hot liquid passes to the “back of the system” and dissipates the heat to the air outside the case
    - Some systems require replacing the liquid periodically
  + Phase-Change Cooling (Vapor Cooling)
    - Expensive system
    - Gas is converted to liquid then converted back to gas (????) “Similar to a refrigerator”
  + Heat Pipe
    - (???? so it’s a heat sink but tube-shaped? What’s at the end of the pipe?)
  + Passive Cooling
    - A heat sink *without* fans is called a *passive heat sink*

6) Chipsets

* Chipsets can be known as “motherboard chipsets” because they are often located on the motherboard
* Looks similar to a CPU and is generally covered by a heat sink
* (???? I am not sure what a chipset actually does)