# 2.5.5 Computers, Bits and Binary Digits

Why Computers Use Binary Numbers

- Computers use the base-2 system because it's easier to implement it with current electronic technology structures (compared to the traditional base-10 system).
- Computers use Binary Numbers [1] (1 or 0) to store and process information.
- A bit or binary digit is usually represented in the computer's main memory by a transistor (see the following image and description) that is switched on (1) or off (0) [http://hyperphysics.phy-astr.gsu.edu/hbase/solids/trans.html].

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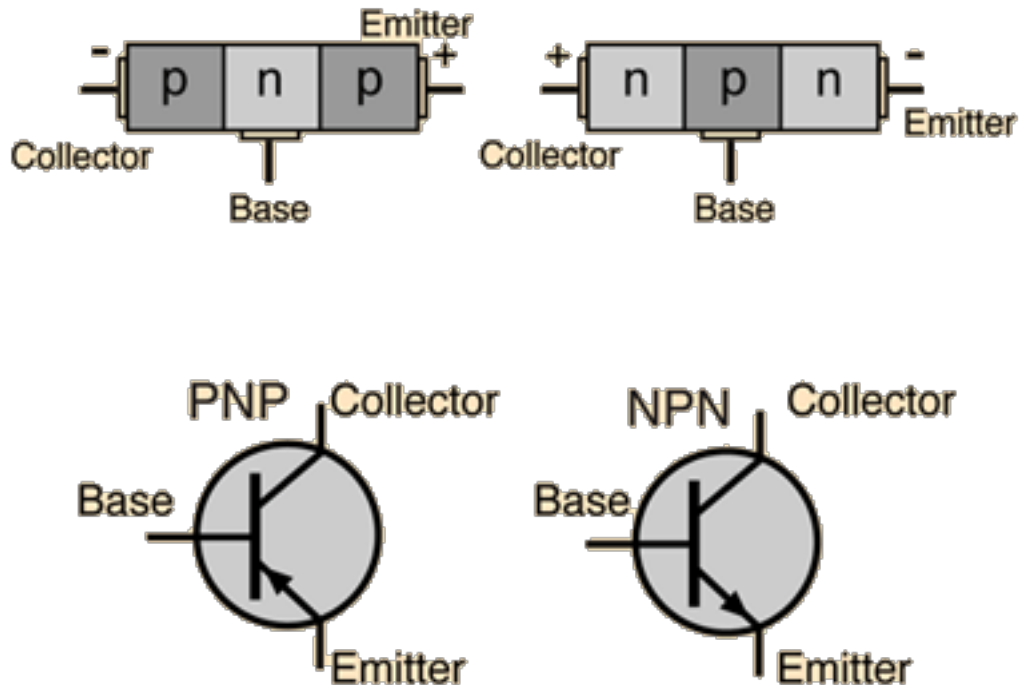
[1] http://www.k16bridge.org/mymentor/includes/file_server.php?f=752061&sid=0

Bits and Bytes

- Binary numbers are represented with either a 1 {true} or a 0 {false}.
- Each zero or one is called a ==bit==, short for **binary digit**
- One bit isn't much information at all so bits are usually grouped into 8-bit chunks - otherwise known as a **byte**
  - **8 bits {00110101} = 1 byte**

byte (8-bits)
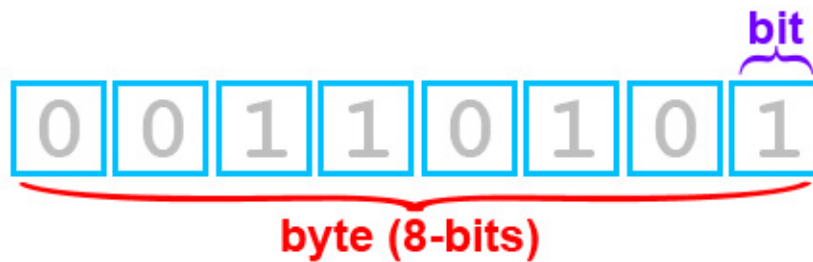
Computer Speed and Bits

- The speed of the computer depends on how many bits (and bytes) it can process at once.
- A 32-bit computer can process 32-bit or 4 bytes of information in one operation
- A 64-bit computer can process 64-bit or 8 bytes of information in one operation

Journal Entry

==Write an example on how you think a computer might process information using Binary Numbers using the information on this page.==