PC HARDWARE AND PERIPHERALS

HILLVIEW INTERNATIONAL HIGH SCHOOL – YEAR 7

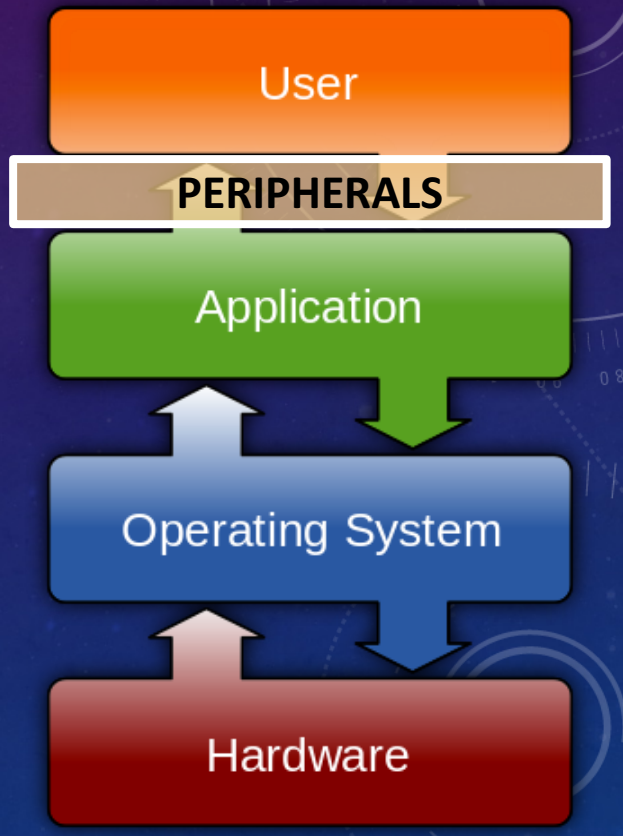
LESSON OUTCOMES

- Understand the key components in a computer
- Understand and be familiar with examples of different types of peripherals:
  - Input
  - Output
- The effect on CPU speed of:
  clock speed, the number of cores, and cache memory

INSIDE A COMPUTER

COMPUTER PERIPHERALS

- Three types:
  - Input
    - Provides data and/or control signals (“inputs”) from users or other computers
  - Output
    - Sends data and/or control signals (“outputs”) to users or other computers
  - Input/output
    - Devices that process both inputs and outputs

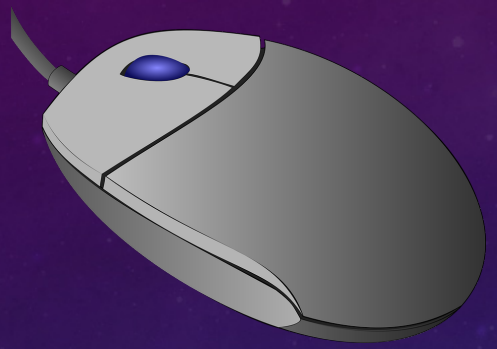


WORKSHEET TASK 1: PERIPHERALS - INPUT, OUTPUT OR BOTH?

- Complete Worksheet Task 1
- Identify what the peripheral is and…
- Is it an input, output or input/output device?

- ***You have 5 minutes!***

ANSWERS: INPUT, OUTPUT OR BOTH?



Mouse

input device

Speakers

output device

Microphone

input device

Touchscreen monitor

input/output device

CPU SPEED

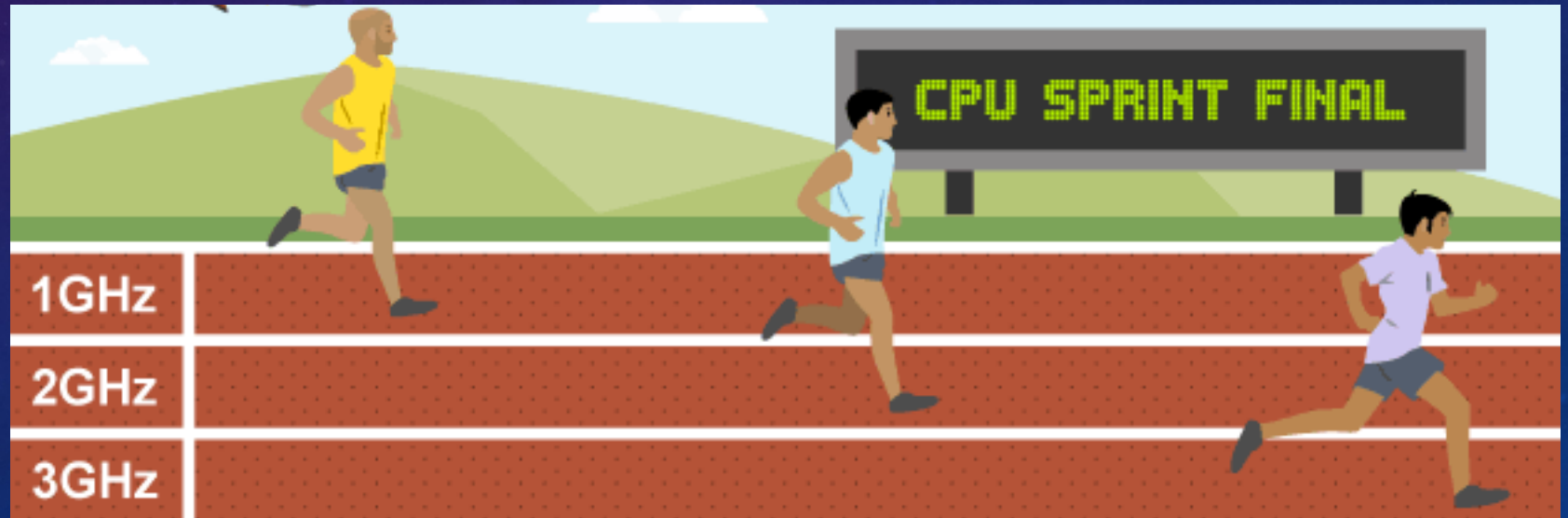
A computer’s speed is heavily influenced by the CPU it uses.

3 main factors that affect how quickly a CPU can carry out instructions:

1. CPU clock speed
2. Number of cores
3. Cache memory

CLOCK SPEED

- CPUs can only carry out one instruction at a time.
- The speed at which the CPU can carry out instructions is called the clock speed
- With every tick of the clock, the CPU fetches and executes one instruction.
- The clock speed is measured in cycles per second
  - One cycle per second is known as 1 hertz.
  - CPU with a clock speed of 2 gigahertz (GHz) can carry out two billion cycles per second.
- The higher the clock speed a CPU has, the faster it can process instructions.



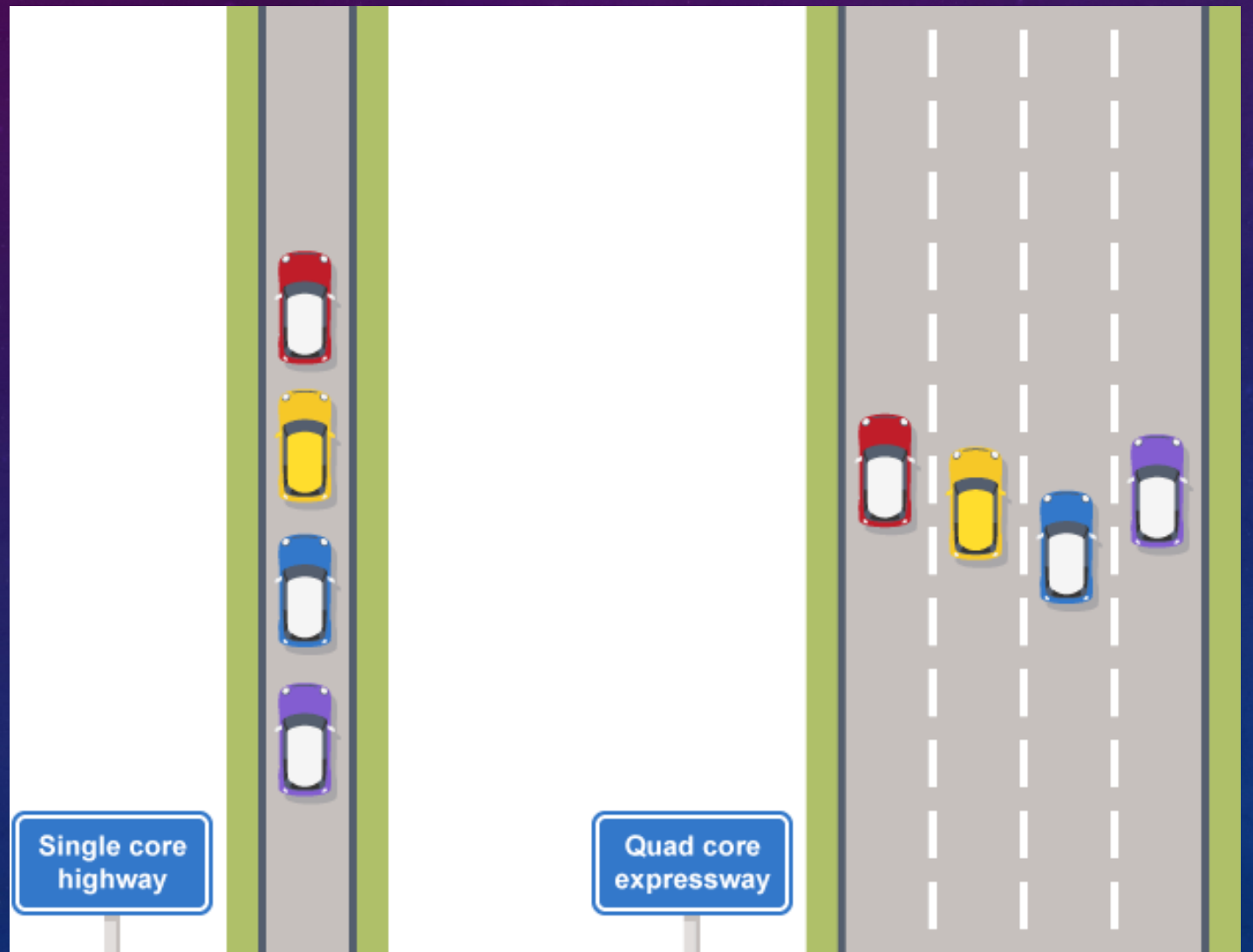
NUMBER OF CORES

- Older CPUs have a single core
- Most modern CPUs have 2, 4 or 8 cores (Multi-Core)
  - Dual Core, Quad Core, Octo Core

- Dual Core CPU can process 2 instructions in the time it takes a Single Core CPU to process one
- Quad Core CPU can process 4 instructions in the time it takes a Single Core CPU to process one

- Multi-Core CPUs are more expensive than Single Core CPUs to design and make
- Instructions have to be split between cores with the results merged together again at the end
  - Slows the processor down a little
  - Makes programming more complicated

NUMBER OF CORES

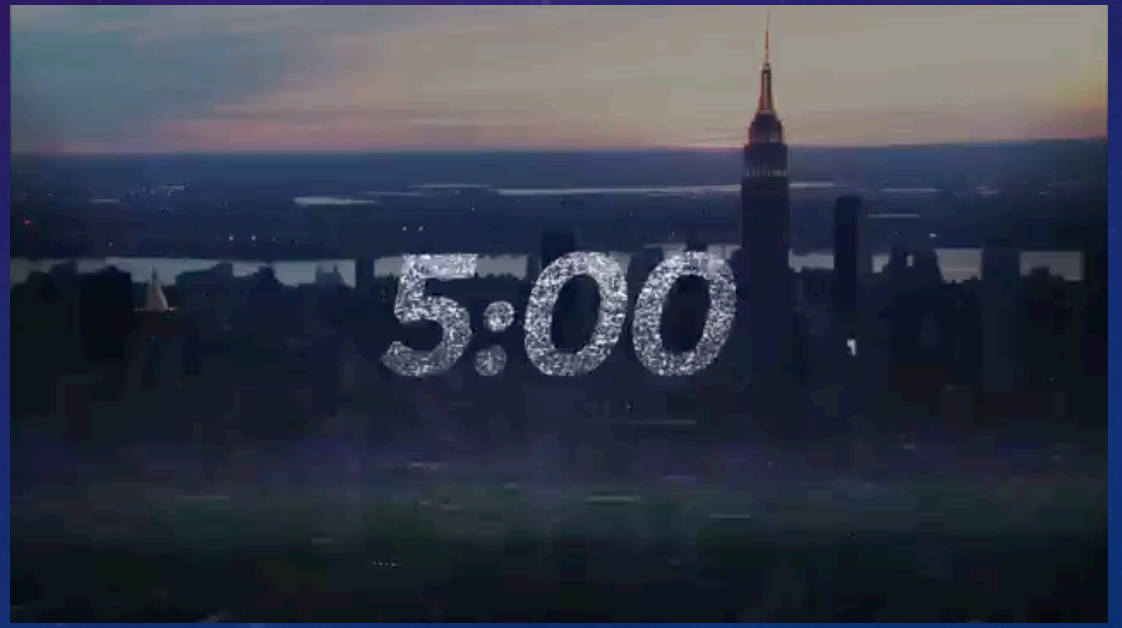


CACHE MEMORY

- Tiny block of memory built right onto the processor – **fastest memory of all**
  - Cache is faster than RAM, which is faster than storage (HDD)
- The most commonly used instructions and data are stored in the cache
- The bigger the cache is, the more instructions can be stored

WORKSHEET TASK 2: CPU

- Complete Worksheet Task 2
- ***You have 5 minutes!***



ANSWERS: TASK 2 - CPU

What is clock speed measured in?

Cycles per second or Hertz

How many cycles per second would a 3 GHz processor do?

3 billion

How many operations per cycle can a quad core CPU perform?

Four

Which memory is faster: cache or RAM?

Cache

LESSON OUTCOMES

- **All – Level 4:**
  - Understand the key components in a computer
  - Understand and be familiar with examples of different types of peripherals:
    - Input
    - Output
  - The effect on CPU speed of clock speed, the number of cores, and cache memory
  - Score 5 out of 10 on the tasks with help
- **Most – Level 5:**
  - Score 8 out of 10 on the tasks with little help
- **Some – Level 6:**
  - Score full marks on the tasks without help

NEXT WEEK

- Systems software
  - Operating systems
  - Device drivers
  - Utility software
- Applications