

## UA Gateway Unit Planning Guide

### Individual Lesson Plans

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Course: Design and Technology 1

School Year: 2011-2012

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**Unit:**

**Lesson:**

### Learning Goals:

1. I can identify the different units of measurements used to calculate computer speeds.
2. I can calculate different speeds of computer devices.

### Resources for Lesson

[http://en.wikipedia.org/wiki/Front-side\\_bus](http://en.wikipedia.org/wiki/Front-side_bus)

<http://en.wikipedia.org/wiki/Terabyte>

[http://www.youtube.com/watch?v=p\\_6fUYa3PMk](http://www.youtube.com/watch?v=p_6fUYa3PMk) - POSSIBLE VIDEO

### Vocabulary:

Megahertz, Gigahertz, Gigabytes, Megabytes, Terabytes, Front Side Bus, Multiplier, Cache

### Starter\* (Building on Background Knowledge):

1,000,000 Hz = 1 MHz

1000 MHz = 1 GHz

1024MB = 1GB

1024 GB = 1TB

Using the above following formulas as a guide, calculate the following:

- 1) 2.2 GHz is equal to \_\_\_\_\_ MHz
- 2) 2,500,0000 Hz is equal to \_\_\_\_\_ MHz
- 3) 2TB is equal to \_\_\_\_\_ MB
- 4) 4096MB is equal to \_\_\_\_\_ GB
- 5) 2.5GB is equal to \_\_\_\_\_ MB

\* Indicates a formative assessment.

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**Motivation:** The problems we just worked on required you to calculate what types of measurements?

Ans: Computer speeds and memory etc.

In front of the room are several computers and laptops. I am going to ask us to take a poll on which machine we think is the fastest, but before doing that, I want us to think about why it is that we think a particular machine is actually the fastest, and how it is that we can validate our guess.

**Ask:** Which machine do you think is the fastest? Why? Raise your hand to cast your vote.

Students vote and are asked to explain why.

**Ask:** Following this activity, what do you think today's AIM and Goals maybe?

**AIM: How do we calculate the speed of a computer?**

**Mini-Lesson (“I do”):**

Teacher presents slides explaining the different measurements. MHz, GHz, Front Side Bus, Multipliers, and Cache then present students with handouts on calculating speeds.

Slide Topics?

- 1) What does MHz stand for?  
MEGAHERTZ (ELABORATE)
- 2) What does GHz stand for?  
GIGAHERTZ (ELABORATE)
- 3) What is Front Side Bus?  
[http://en.wikipedia.org/wiki/Front-side\\_bus](http://en.wikipedia.org/wiki/Front-side_bus)
- 4) What are the computers Processor? How is its speed determined?  
The [frequency](#) at which a processor (CPU) operates is determined by applying a clock multiplier to the front-side bus (FSB) speed in some cases. For example, a processor running a 3200 [MHz](#) might be using a 400 MHz FSB. This means there is an internal [clock multiplier](#) setting (also called bus/core ratio) of 8. That is, the CPU is set to run at 8 times the frequency of the front-side bus:  $400 \text{ MHz} \times 8 = 3200 \text{ MHz}$ . By varying either the FSB or the multiplier, different CPU speeds can be achieved.
- 5) What is Cache?  
Temporary Storage that allows data to travel between the Processor and RAM.  
[http://en.wikipedia.org/wiki/CPU\\_cache](http://en.wikipedia.org/wiki/CPU_cache)
- 6) The speed of a computer however is determined by a combination of the following  
By a combination of the speed of the Processor, the Size of the Hard Drive, and the amount of RAM combined.

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### Guided Practice (“We do”):

Teacher models calculating processor speeds.

$$400 \text{ MHz} \times 8 = 3200 \text{ MHz (3.2MHz)}$$

### Independent Practice (“You do”):

Students complete activity individually. Calculate the following / find the multiplier.

$$600 \text{ MHz} \times 6 = \underline{\hspace{2cm}}$$

$$2\text{GHz} \times 2 = \underline{\hspace{2cm}}$$

$$\underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = 4400 \text{ MHz}$$

$$\underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = 3\text{GHz}$$

$$3.4 \text{ GHz is equal to } \underline{\hspace{2cm}} \text{ MHz}$$

$$1,500,0000 \text{ Hz is equal to } \underline{\hspace{2cm}} \text{ MHz}$$

$$1\text{TB is equal to } \underline{\hspace{2cm}} \text{ MB}$$

$$3072\text{MB is equal to } \underline{\hspace{2cm}} \text{ GB}$$

$$1.5\text{GB is equal to } \underline{\hspace{2cm}} \text{ MB}$$

(IF TIME PERMITS INFORM STUDENTS TO LOOK UP SPEEDS OF THEIR OWN COMPUTERS AND RECORD IT)

### Share/Summary:

What are the different units used in measuring computer hardware?

MHz, GHz, MB, TB, Hz etc.

How do we measure the speed of a computers processor?

FSB x Multiplier (Frequency of FSB)

How do we determine the speed of an overall computer processor?

### Exit Task\*:

Students make corrections, and fill in any missing information before submitting.

Homework:

Look up the speed of your computer at home or here at school and write it down.

\* Indicates a formative assessment.