## Multiplying 2 numbers in a different base:

A. Usually when multiplying numbers in a different base you will have one number that is only a single digit.

1. Multiply the single digit by the ones digit first. If the resulting number is greater than the base then find the remainder after dividing by b (i.e. n MOD b). Also, find the number of times b goes into n (i.e. n DIV b) and carry this number.
2. Next, multiply the single digit by the next digit and repeat the steps in step 1. Continue until you have multiplied by all the digits.

B. Examples:

Ex [1] $133_4 \times 3_4 =$_____$_4$.

a. First multiply 3 x 3 which is 9. 9 MOD 4 = 1. Write down 1. 9 DIV 4 = 2. Carry *2.
b. 3 x 3 = 9 + *2 = 11. 11 Mod 4 = 3. Write down 3. 11 DIV 4 = 2. Carry *2.
c. 3 x 1 = 3 + *2 = 5. 5 MOD 4 = 1. Write down 1. 5 DIV 4 = 1. Since there are no more numbers left to multiply by, write down the 1.
d. The answer is 1131.

Ex [2] $41_6 \times 5_6 =$_____$_6$.

a. 5 x 1 = 5. Since 5 is less than 6, write down 5 and there will be no numbers to carry.
b. 5 x 4 = 20. 20 MOD 6 = 2. Write down 2. 20 DIV 6 = 3. Since there are no more numbers left to multiply by, write down the 3.
c. The answer is 325.

Ex [3] $104_8 \times 6_8 =$_____$_8$.

a. 6 x 4 = 24. 24 MOD 8 = 0. Write down 0. 24 DIV 8 = 3. Carry *3.
b. 6 x 0 = 0 + *3 = 3. Since 3 is less than 8, write down 3 and there will be no numbers to carry.
c. 6 x 1 = 6. Since 6 is less than 8, write down 6.
d. The answer is 630.