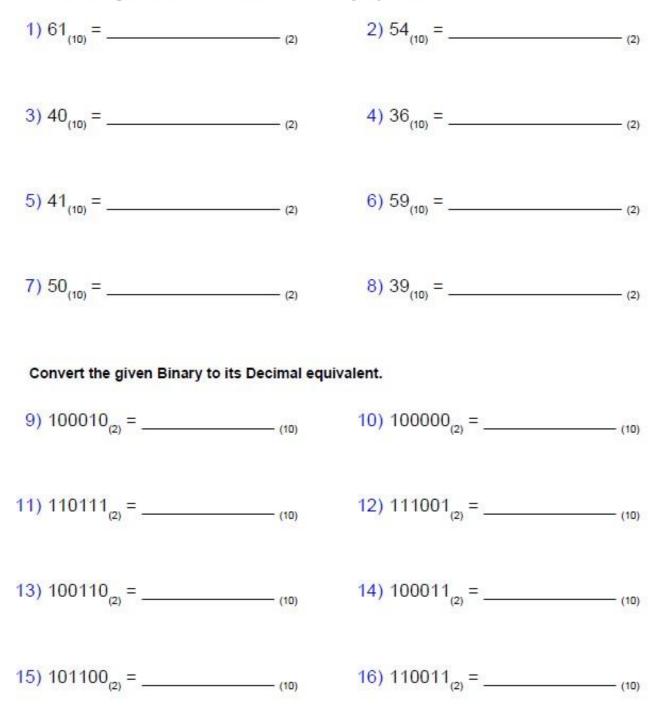
Name:	 		
Date:			

Converting Decimal and Binary Numbers

Convert the given Decimal number to its Binary equivalent.



Name:	
Date:	

The Journey Inside[™]: Digital Information Student Handout: ASCII Computer Code

ASCII Computer Code

Computers work in binary code. Information is coded using 0s and 1s. Each 0 or 1 is called a *bit*. In the early years of computer development, different computer companies applied the binary system in their own way. The code for the letters in the word "cat" was often different in different brands of computers.

Eventually, a set of standards was developed. Computer manufacturers agreed to use one code called the ASCII (American Standard Code for Information Interchange). ASCII is an 8-bit code. That is, it uses eight bits to represent a letter or a punctuation mark. Eight bits are called a byte. A binary code with eight digits, such as 1101 1011₂, can be stored in one byte of computer memory. The word "CAT" in a word processor becomes 0100 0011₂, 0100 0001₂, and 0101 0100₂. The word "cat" is 0110 0011₂, 0110 0001₂, and 0111 0100₂.



Each letter, number, and symbol is represented by an 8-bit ASCII code. Part of the ASCII code is given in this handout. Notice that there is even an ASCII code for a blank space.

Name: _____ Date: _____

Activities

1. Use the ASCII code to write your first name or nickname in binary numbers beginning with an uppercase letter and continuing with lowercase letters. Put the letters of your name in the first column.

Letter	Binary representation of the letter								
								2	
				e			-		
	-						-		

3

Name: _____ Date:

2. In the space below, write a short message in decimal and binary (using the ASCII code). Exchange messages with a partner and decode each other's message. (*hint: a helpful resource for this would be one of following website: <u>https://www.binaryhexconverter.com/binary-to-ascii-text-converter</u> or <u>https://www.branah.com/ascii-converter</u> Or just google "binary to ascii converter" or "decimal to asci converter")*

A. Your ASCII message in binary notation (you can use the blank space on page 2 as scratch paper to help you find this):

B. Your partner's ASCII message in binary and decimal notation as well as decoded:

- 3. The ASCII code for a blank space is the decimal number 32, or the binary number 0010 0000₂. Why do you think it is imprtant to have a code for a blank space?
- 4. How many characters of text are there in an average book? To help answer this question, select several different books of varying lengths. For each book, estimate the number of characters of text. Remember to count the punctuation marks and include the blank character between words and sentences. Since ASCII is an 8-bit code and requires 8 binary numbers to represent each letter, blank space, or punctuation mark, how many binary numbers does it take to represent the text of an average book? (Hint: Multiply 8 by the average number of text characters.)