**Presentation Notes**

1. What does the ASCII acronym stand for?

American Standard Code for Information Interchange

1. What is the ASCII code used for?
   * Representing and storing text in computers
     + Computers can only understand numbers (binary)
     + Text symbols must be encoded as numbers
   * Encoding text for electronic communication (e.g. web)
     + Sending and receiving computers must both agree and understand the same encoding standard
2. Encoding characters (i.e. letters on the keyboard) into ASCII code numbers  
   1. What is the ASCII code for the letter “A”65
   2. What is the ASCII code for the letter “a”97
   3. Why are they different?
3. Upper case and lower case are different symbols. The computer doesn't really know what the alphabet is or how to read and write.

* 1. What is the ASCII code for the space bar?

The ASCII code also includes some "un-printable" characters.

1. Decoding ASCII code numbers into characters and letters   
   1. What character corresponds to ASCII code 61 decimal=
   2. What character corresponds to ASCII code 8 decimal backspace
   3. Why is the character 8 not the same as ASCII code 8

Character "8" is text symbol, code 8 is an number. Symbols and numbers are different things to a computer.

* 1. What is the range of non-printable characters in ASCII Codes 0 to 31

1. How would you code the string “Hello” in ASCII?  
   72101108108111
2. How would you code the string “127” in ASCII?  
     
   495055
3. What is the difference between 127 and “127”?

127 is an integer number. Computers don't need to use ASCII for numbers.  
"127" is a string of text symbols. A human might see this as the number 127. A computer doesn't know it's a number.

**Student Questions**

# Why do computers have to convert characters (i.e. letters on the keyboard) into numbers? Why can’t computers just use the letters directly?

Representing text. When any key on a keyboard is pressed, it needs to be converted into a binary number so that it can be processed by the computer and the typed character can appear on the screen. A code where each number represents a character can be used to convert text into binary. This directly corresponds to there either being an electrical current those characters, because binary is actually 2 states of the computer

1. How do computers communicate with people who speak different languages and use

Unicode is a 16-bit character set where all characters occupy the same space. ... In most character sets a single value is often assigned to several characters. For example, in ASCII a "-" is used to represent a hyphen, a minus sign, a dash and a non-breaking hyphen. In Unicode each meaning is given its own code.

1. Research online-documentation for the Python **ord()** function. Provide some sample code that demonstrates the use of the **ord()** function.

# inbuilt function return an

# integer representing the Unicode code

value = ord("A")

# writing in ' ' gives the same result

value1 = ord('A')

# prints the unicode value

print value, value1

1. Research online-documentation for the Python **chr()** function. Provide some sample code that demonstrates the use of the **chr()** function.

# Python program to illustrate

# chr() builtin function

print(chr(71), chr(101),

chr(101), chr(107),

chr(115), chr(32),

chr(102), chr(111),

chr(114),chr(32),

chr(71), chr(101),

chr(101), chr(107),

chr(115))

1. Write a Python program that uses the ord() and chr() functions to do the following:
   1. Read a single character (i.e. single letter or keyboard symbol) from the console input.
   2. Convert the character to an ASCII code number.
   3. Add 3 to the code number.
   4. Convert the new code number back to a character (i.e. single letter or keyboard symbol)
   5. Print the new character to the console output.

value = str(input("Enter a number:"))

number = ord(value)

print(ord(value))

newNumber = number + 3

print(chr(newNumber))

1. Enhance your program to add the following features:
   1. After reading the single character from console input, check to make sure that the character is a letter (i.e. a to z or A to Z). Print a warning message if the character is not a letter.
   2. After converting the code number back to a character, print a “\*” if the character is not a letter.

**Extension (Optional)**

1. Extend your program to operate on a string read in from the console input.
   1. Use a loop to process the string as a sequence of single characters
   2. Use your original code process the characters
   3. Append the characters to make a new output string
   4. Print the new string to console output

letter = str(input)

symbol = ord(letter)

if (symbol >= 97) and (symbol <= 122) :

print (symbol)

elif (symbol >= 65) and (symbol <= 90) :

print (symbol)

elif (symbol < 97) or (symbol > 122) :

print ("\*")

elif (symbol < 65) or (symbol > 90) :

print ("\*")