**Presentation Notes**

1.    What does the ASCII acronym stand for?

**American Standard Code for Information Interchange**

2.    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**

3.    Encoding characters (i.e. letters on the keyboard) into ASCII code numbers

a.    What is the ASCII code for the letter “**A**”

**65**

b.    What is the ASCII code for the letter “**a**”  
**97**

c.     Why are they different?  
**Upper case and lower case are different symbols. The computer doesn't really know what the alphabet is or how to read and write.**

d.    What is the ASCII code for the space bar?

**32**

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

4.    Decoding ASCII code numbers into characters and letters

a.    What character corresponds to ASCII code 61 decimal

**=**

b.    What character corresponds to ASCII code 8 decimal

**backspace**

c.     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.**

d.    What is the range of non-printable characters in ASCII

**Codes 0 to 31**

**5.**    How would you code the string “Hello” in ASCII?

**H   e      l      l      o**

**72 101 108 108 111**

**6.**    How would you code the string “127” in ASCII?  
  
**1    2   7**

**49 50 55**

7.    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**

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

**Computers only understand binary data, which are numbers (0 and 1). Letters are not binary data.**

2.    How do computers communicate with people who speak different languages and use different alphabets? What is used instead of the ASCII code table?

**Unicode is a computer coding system that aims to unify text exchanges at the international level. With Unicode, each computer character is described by a name and a code identifying it uniquely regardless of the computer medium or the software used. Unicode has already listed over 100000 characters.**

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

**Given a string of length one, return an integer representing the Unicode code point of the character when the argument is a unicode object, or the value of the byte when the argument is an 8-bit string.**

# 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

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

**The Python chr() function is a built-in Python function that returns the string representing a character whose Unicode is an integer.**

# 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))

5.    Write a Python program that uses the ord() and chr() functions to do the following:

a.    Read a single character (i.e. single letter or keyboard symbol) from the console input.

b.    Convert the character to an ASCII code number.

c.     Add 3 to the code number.

d.    Convert the new code number back to a character  (i.e. single letter or keyboard symbol)

e.    Print the new character to the console output.

6.    Enhance your program to add the following features:

a.    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.

b.    After converting the code number back to a character, print a “\*” if the character is not a letter.

**Extension (Optional)**

7.    Extend your program to operate on a string read in from the console input.

a.    Use a loop to process the string as a sequence of single characters

b.    Use your original code process the characters

c.     Append the characters to make a new output string

d.    Print the new string to console output