**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
2. Encoding characters (i.e. letters on the keyboard) into ASCII code numbers  
   1. What is the ASCII code for the letter “A”

**65**

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

**97**

* 1. 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**

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

**32  
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

**=**

* 1. What character corresponds to ASCII code 8 decimal

**backspace**

* 1. 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?  
     
   **H e l l o**

**72 101 108 108 111**

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

**49 50 55**

1. What is the difference between 127 and “127”?

**The difference is that 127 is an integer number and 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?  
   **The computer doesn't really know what the alphabet is or how to read and write**
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 character encodings, including **UTF**-7, **UTF**-8, **UTF**-16, and **UTF**-32. **UTF**-7 - uses 7 bits for each character. It was designed to represent ASCII characters in email messages that required Unicode encoding.

**They convert the ASCII numbers into characters so that humans can understand**

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

Print(“the ASCII value of 7 is ord(“7”))

Print(“the ASCII value of A is”,ord(“A”))

1. 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

**>>>print(chr(98))b**

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.

chrIndex = input(" type a single character: ")

ordIndex = ord(chrIndex)

ordOut = ordIndex + 3

chrOut = chr(ordOut)

print("The character shifted by 3 is:", chrOut)

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.

#chrIndex = input("Type a single letter: ")

#ordIndex = ord(chrIndex)

#isChrOk = Falseif (ordIndex >= ord('b') and ordIndex <= ord('f')) :

isChrOk = True

elif (ordIndex >= ord('A') and ordIn <=('z')) :

isChrOk = True

else :

print("Warning! Typed character is not a letter")

ordOut = ordIn + 3

if (ordOut >= ord('b'))

#chrOut = chr(ordOut)

#print("The character shifted by 3 is:", chrOut)

**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