**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

1. 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

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”?

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 have to convert characters into numbers because in coding the numbers are better for computers because the computers do not understand the letters that humans use so the computers use numbers to help them understand.

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

The computers communicate using the Unicode table and that table has all the languages there.

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

The sample code for the Python ord() function is:

value = ord("A")

print(value)

The Python ord() function shows the value of the letter using the ASCII encoding chart.

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

The sample code for the Python chr() function is:

print(chr(72), chr(101), chr(108), chr(108), chr(111))

The Python chr() function uses the ASCII encoding chart to type out letters .

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.

letter = (input("enter a letter:"))

code = ord(letter) + 3

print(chr(code))

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.
2. letter = (input("enter a letter:"))
3. code = ord(letter)+ 3
4. print(code)
5. if (code >= 91) and (code <= 96) :
6. print("you need to input a letter")
7. elif (code >= 65) and (code <= 90) :
8. print(chr(code))
9. elif (code >= 97) and (code <= 122) :
10. print(chr(code))
12. elif (code >= 0) and (code <= 64) :
13. print("you need to input a letter")
14. elif (code >= 123) and (code <= 127) :
15. print("you need to input 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