

Q1. Since computers use only 0 or 1,  $2^9=512 < 1000 < 2^{10}=1024$ , so 10 bits .

Q2.

10(10) = 00001010(2)

120(10)=01111000(2)

-----  
130(10)=10000010(2)

in binary, however, we are using 2's complement now, so the 1 colored red is a sign and it means negative.

0000010 => 1111101 = 127(10)

so 10000010 is -127 in 2's complement .