**Converting 15 to Binary (Base 2):**

1. **Lay out empty slots for the number 15**:

\_ \_ \_ \_

8 4 2 1

1. **Begin the conversion**:
   * Is 15 ≥ 8? Yes. Subtract 8 from 15. Remaining: 7. Place a 1 in the 8's slot.  
     1 \_ \_ \_
   * Is 7 ≥ 4? Yes. Subtract 4 from 7. Remaining: 3. Place a 1 in the 4's slot.  
     1 1 \_ \_
   * Is 3 ≥ 2? Yes. Subtract 2 from 3. Remaining: 1. Place a 1 in the 2's slot.  
     1 1 1 \_
   * Is 1 ≥ 1? Yes. Subtract 1 from 1. Remaining: 0. Place a 1 in the 1's slot.  
     1 1 1 1

Binary representation of 15: 1111.

**Converting 32 to Binary (Base 2):**

1. **Lay out empty slots for the number 32**:

\_ \_ \_ \_ \_ \_

32 16 8 4 2 1

1. **Begin the conversion**:
   * Is 32 ≥ 32? Yes. Subtract 32 from 32. Remaining: 0. Place a 1 in the 32's slot and 0's in all the others.  
     1 0 0 0 0 0

Binary representation of 32: 100000.

**Converting 117 to Binary (Base 2):**

1. **Lay out empty slots for the number 117**:

\_ \_ \_ \_ \_ \_ \_

64 32 16 8 4 2 1

1. **Begin the conversion**:
   * Is 117 ≥ 64? Yes. Subtract 64 from 117. Remaining: 53. Place a 1 in the 64's slot.  
     1 \_ \_ \_ \_ \_ \_
   * Is 53 ≥ 32? Yes. Subtract 32 from 53. Remaining: 21. Place a 1 in the 32's slot.  
     1 1 \_ \_ \_ \_ \_
   * Is 21 ≥ 16? Yes. Subtract 16 from 21. Remaining: 5. Place a 1 in the 16's slot.  
     1 1 1 \_ \_ \_ \_
   * Is 5 ≥ 8? No. Place a 0 in the 8's slot.  
     1 1 1 0 \_ \_ \_
   * Is 5 ≥ 4? Yes. Subtract 4 from 5. Remaining: 1. Place a 1 in the 4's slot.  
     1 1 1 0 1 \_ \_
   * Is 1 ≥ 2? No. Place a 0 in the 2's slot.  
     1 1 1 0 1 0 \_
   * Is 1 ≥ 1? Yes. Subtract 1 from 1. Remaining: 0. Place a 1 in the 1's slot.  
     1 1 1 0 1 0 1

Binary representation of 117: 1110101.

**Converting 255 to Binary (Base 2):**

1. **Lay out empty slots for the number 255**:

\_ \_ \_ \_ \_ \_ \_ \_

128 64 32 16 8 4 2 1

1. **Begin the conversion**:
   * Is 255 ≥ 128? Yes. Subtract 128 from 255. Remaining: 127. Place a 1 in the 128's slot.  
     1 \_ \_ \_ \_ \_ \_ \_
   * Is 127 ≥ 64? Yes. Subtract 64 from 127. Remaining: 63. Place a 1 in the 64's slot.  
     1 1 \_ \_ \_ \_ \_ \_
   * Is 63 ≥ 32? Yes. Subtract 32 from 63. Remaining: 31. Place a 1 in the 32's slot.  
     1 1 1 \_ \_ \_ \_ \_
   * Is 31 ≥ 16? Yes. Subtract 16 from 31. Remaining: 15. Place a 1 in the 16's slot.  
     1 1 1 1 \_ \_ \_ \_
   * Is 15 ≥ 8? Yes. Subtract 8 from 15. Remaining: 7. Place a 1 in the 8's slot.  
     1 1 1 1 1 \_ \_ \_
   * Is 7 ≥ 4? Yes. Subtract 4 from 7. Remaining: 3. Place a 1 in the 4's slot.  
     1 1 1 1 1 1 \_ \_
   * Is 3 ≥ 2? Yes. Subtract 2 from 3. Remaining: 1. Place a 1 in the 2's slot.  
     1 1 1 1 1 1 1 \_
   * Is 1 ≥ 1? Yes. Subtract 1 from 1. Remaining: 0. Place a 1 in the 1's slot.  
     1 1 1 1 1 1 1 1

Binary representation of 255: 11111111.

**Converting 946 to Binary (Base 2):**

1. **Lay out empty slots for the number 946**:

\_ \_ \_ \_ \_ \_ \_ \_ \_ \_

512 256 128 64 32 16 8 4 2 1

1. **Begin the conversion**:
   * Is 946 ≥ 512? Yes. Subtract 512 from 946. Remaining: 434. Place a 1 in the 512's slot.  
     1 \_ \_ \_ \_ \_ \_ \_ \_ \_
   * Is 434 ≥ 256? Yes. Subtract 256 from 434. Remaining: 178. Place a 1 in the 256's slot.  
     1 1 \_ \_ \_ \_ \_ \_ \_ \_
   * Is 178 ≥ 128? Yes. Subtract 128 from 178. Remaining: 50. Place a 1 in the 128's slot.  
     1 1 1 \_ \_ \_ \_ \_ \_ \_
   * Is 50 ≥ 64? No. Place a 0 in the 64's slot.  
     1 1 1 0 \_ \_ \_ \_ \_ \_
   * Is 50 ≥ 32? Yes. Subtract 32 from 50. Remaining: 18. Place a 1 in the 32's slot.  
     1 1 1 0 1 \_ \_ \_ \_ \_
   * Is 18 ≥ 16? Yes. Subtract 16 from 18. Remaining: 2. Place a 1 in the 16's slot.  
     1 1 1 0 1 1 \_ \_ \_ \_
   * Is 2 ≥ 8? No. Place a 0 in the 8's slot.  
     1 1 1 0 1 1 0 \_ \_ \_
   * Is 2 ≥ 4? No. Place a 0 in the 4's slot.  
     1 1 1 0 1 1 0 0 \_ \_
   * Is 2 ≥ 2? Yes. Subtract 2 from 2. Remaining: 0. Place a 1 in the 2's slot and a 0 in the 1's slot.  
     1 1 1 0 1 1 0 0 1 0

Binary representation of 946: 1110110010.