








4.2. Comparing Binary and Decimal Numbers

1. **Practice:** in **TABLE 1** using blocks and binary digits (1 & 0) represent binary numbers. Then, take turns creating binary numbers and finding equivalent decimal values.

2^5 ($2 \times 2 \times 2 \times 2 \times 2 = 32$)	2^4 ($2 \times 2 \times 2 \times 2 = 16$)	2^3 ($2 \times 2 \times 2 = 8$)	2^2 ($2 \times 2 = 4$)	2^1 ($2 \times 1 = 2$)	2^0 ($2 \times 0 = 1$)
					

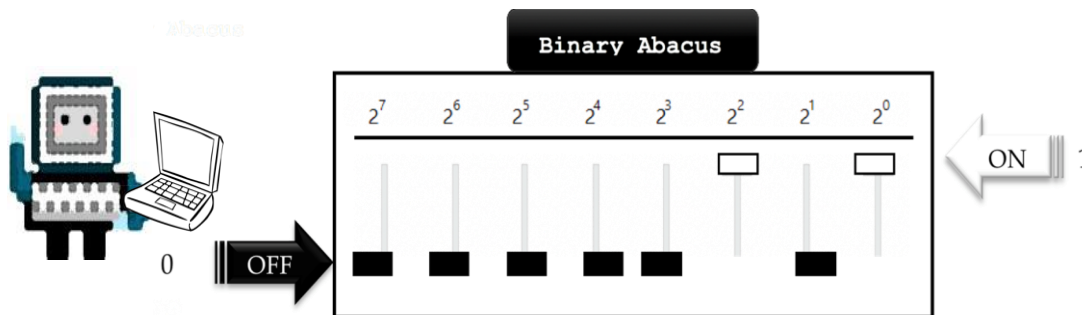
Play: What value do we have if we take the red block off? Why?

2. **Compare:** These numbers look the same, but they don't have the same value. **Why?** Note that on the left there's a decimal number and on the right a binary number.

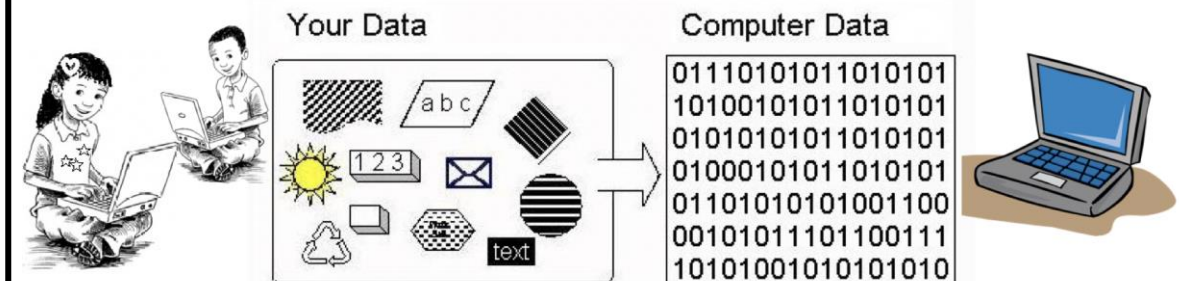
10^2	10^1	10^0	2^2	2^1	2^0
1	1	0	1	1	0
					

Which number is worth more?

3. **Represent Binary numbers using the Binary Abacus.** Take turns creating binary numbers by switching values **on** (1) or **off** (0). And talk about how the digits placement affect the value.






4. **Practice:** Using the handout: **TABLE 2: Comparing Numbers**, work in pairs and compare results of conversions. Check answers in Binary Abacus.



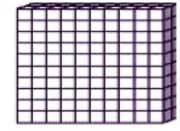
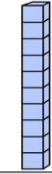
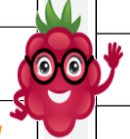


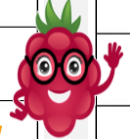
Why is it important to study binary numbers when using computers?

4.2. Comparando Números Binarios con Números Decimales

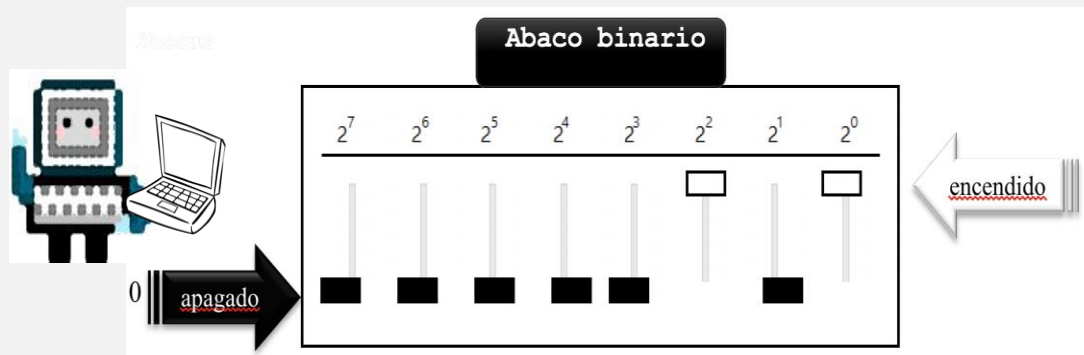
1. **Practiquen:** En la **TABLA 1**, usando blocks dígitos binarios (1 y 0) creen números binarios. Luego, tomen turnos para crear números binarios y hallar su valor decimal equivalente.

2^5 ($2 \times 2 \times 2 \times 2 \times 2 = 32$)	2^4 ($2 \times 2 \times 2 \times 2 = 16$)	2^3 ($2 \times 2 \times 2 = 8$)	2^2 ($2 \times 2 = 4$)	2^1 ($2 \times 1 = 2$)	2^0 ($2 \times 0 = 1$)
					
Jueguen: ¿Qué valor queda si quitamos el block rojo? ¿por qué?					

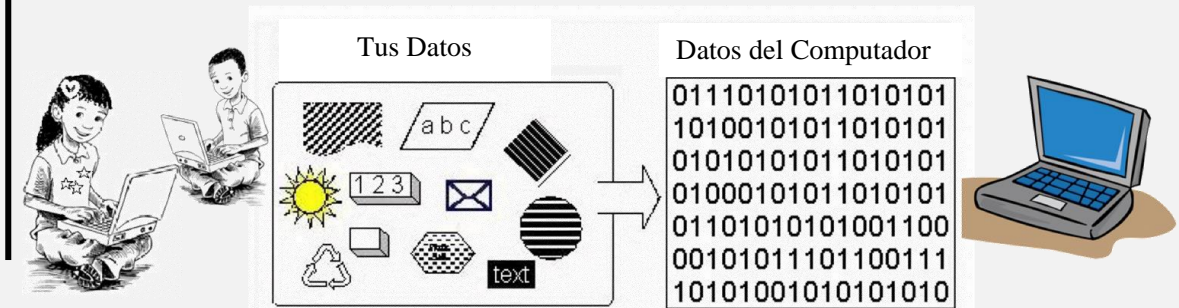
2. **Compáren:** Estos números se miran igual, pero no tienen el mismo valor, ¿por qué? Noten que en la izquierda hay un número decimal y en la derecha un número binario.

10^2	10^1	10^0	2^2	2^1	2^0
1	1	0	1	1	0
					
 ¿Cuál de estos vale más?					

3. **Representen números Binarios** con el **Abaco Binario**.
Tomen turnos creando números binarios **encendiendo** (1) o **apagando** (0) valores binarios, y **conversen** por qué funciona.



4. **Practiquen:** Usando el handout llamado: **TABLA 2: Comparando Números**, trabajen en pares y compáren sus resultados. Chequen las respuestas con el ábaco Binario.



¿Por qué es importante estudiar los números binarios al usar computadoras?