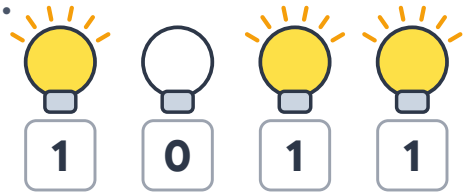
Name _____ Date _____



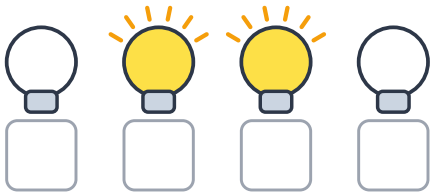
Bits and Bytes

A bit is one 0 or 1. A bulb on is 1, a bulb off is 0.

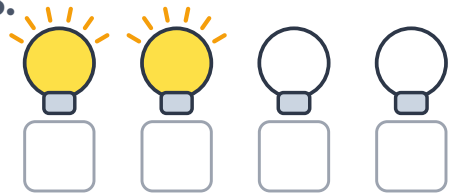
1. Example



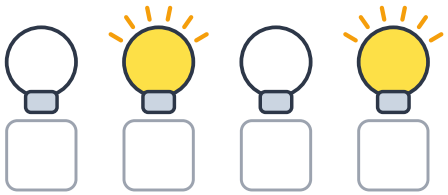
2.



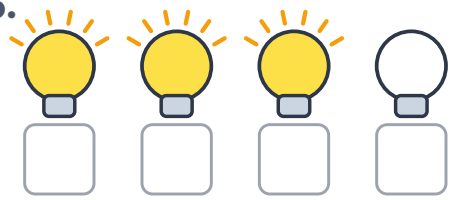
3.



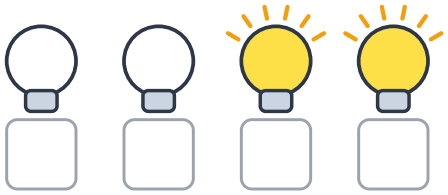
4.



5.



6.



Write all the codes 2 bits can make. One is done.

0 0 ☐☐ ☐☐ ☐☐

Write all the codes 3 bits can make.

0 0 0 ☐☐☐ ☐☐☐ ☐☐☐

☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

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Name _____ Date _____



Bits and Bytes

Each bit you add doubles the codes. 8 bits make a byte.

Bits	1	2	3	4	5	6	7	8
Codes	2	4	8					
	× 2	× 2	× 2	× 2	× 2	× 2	× 2	

1. 8 bits make a byte. How many different codes can one byte make? **256**

Example

2. The smallest number a byte can hold is **0**. What is the biggest? _____

3. How many bits are in **3** bytes? _____

4. How many bits are in **5** bytes? _____

5. How many bytes is **32** bits? _____

6. How many bytes is **72** bits? _____

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Name _____ Date _____



Bits and Bytes

A byte has 8 places, from 128 down to 1. Write each number.

Byte to number

1. 128 64 32 16 8 4 2 1

0 1 0 0 0 0 0 1 = 65

Example

2. 128 64 32 16 8 4 2 1

0 0 1 0 1 0 1 0 = _____

3. 128 64 32 16 8 4 2 1

1 0 0 0 0 0 0 0 = _____

4. 128 64 32 16 8 4 2 1

1 1 0 0 1 0 0 0 = _____

5. 128 64 32 16 8 4 2 1

0 1 1 0 0 1 0 0 = _____

6. 128 64 32 16 8 4 2 1

1 1 1 1 1 1 1 1 = _____

Number to byte

1. 77

128 64 32 16 8 4 2 1

0 1 0 0 1 1 0 1

Example

2. 19

128 64 32 16 8 4 2 1

3. 205

128 64 32 16 8 4 2 1

4. 150

128 64 32 16 8 4 2 1

5. 99

128 64 32 16 8 4 2 1

6. 240

128 64 32 16 8 4 2 1

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Name _____ Date _____

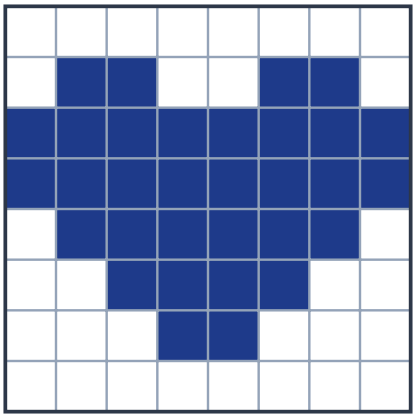


Bits and Bytes

Each row is a byte. Color a square for each 1 to see the picture.

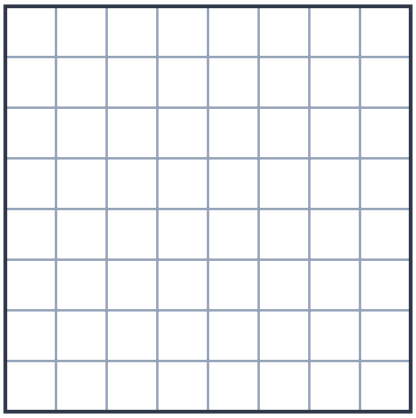
1. Example — **a heart**

00000000
01100110
11111111
11111111
01111110
00111100
00011000
00000000



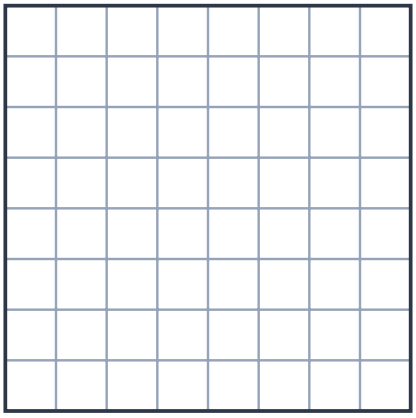
2.

00011000
00111100
01111110
11111111
01000010
01011010
01011010
01111110



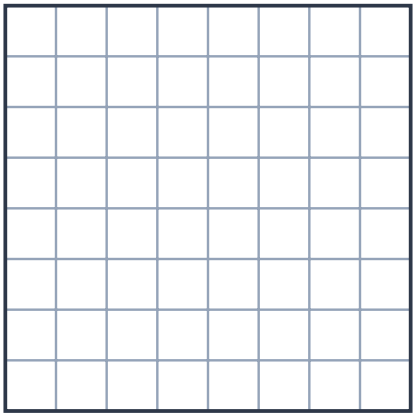
3.

00011000
00111100
01111110
00111100
01111110
11111111
00011000
00011000



4.

00010000
00011000
00011100
00011110
00010000
11111111
01111110
00111100



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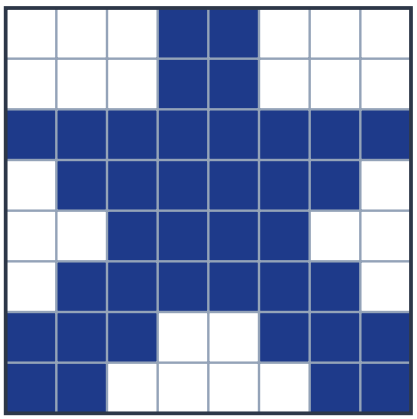
Name _____ Date _____



Bits and Bytes

Write each row as a byte: 1 dark, 0 white. Then make your own!

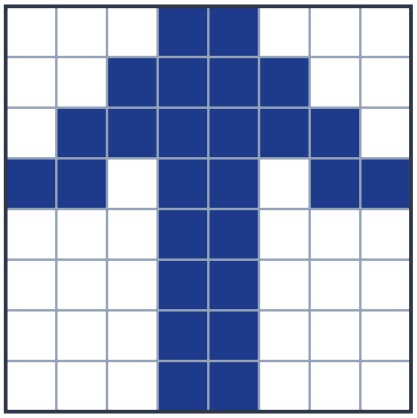
1.



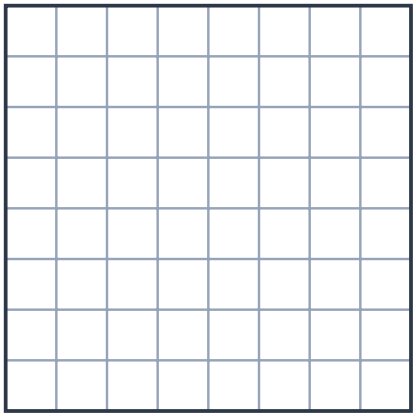
0	0	0	1	1	0	0	0
0	0	0	1	1	0	0	0
1	1	1	1	1	1	1	1
0	1	1	1	1	1	1	0
0	0	1	1	1	1	0	0
0	1	1	1	1	1	1	0
1	1	1	0	0	1	1	1
1	1	0	0	0	0	1	1

Example

2.



3.



Your own picture

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Name _____ Date _____



Bits and Bytes

Computers often store letters as bytes. Decode, then encode.

A 65	B 66	C 67	D 68	E 69	F 70	G 71	H 72	I 73	J 74	K 75	L 76	M 77
N 78	O 79	P 80	Q 81	R 82	S 83	T 84	U 85	V 86	W 87	X 88	Y 89	Z 90

Decode: byte, then number, then letter.

1. 01000010 01001001 01010100 — Example

   66 B ___ ___ ___ ___

2. 01000010 01011001 01010100 01000101

   ___ ___ ___ ___ ___ ___ ___ ___

3. 01001000 01000101 01001100 01001100 01001111

   ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Encode: write the number, then the byte.

4. C ___ A ___ T ___

   ___

5. S ___ N ___ O ___ W ___

   ___

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Name _____ Date _____



Bits and Bytes

Bits and bytes in real life. Solve each story.

1. A computer stores the word SNOW with one byte for each letter. How many bytes is that? How many bits?

4 bytes

32 bits

Example

2. A text message has **18** letters and **3** spaces. Each letter and each space takes one byte. How many bytes?

_____ bytes

3. A tiny black-and-white picture is **8** squares wide and **8** tall, one bit a square. How many bits? How many bytes?

_____ bits

_____ bytes

4. A picture is **16** squares wide and **16** tall, one bit a square. How many bytes does it take?

_____ bytes

5. In a gray picture each square takes one byte, so it can be any of **256** shades. How many bytes for **10** squares by **10**?

_____ bytes

6. A kilobyte is about **1,000** bytes. A story has about **4,000** letters and spaces, one byte each. About how many kilobytes?

_____ kilobytes

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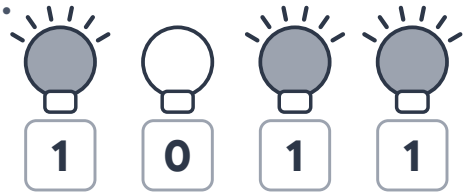
Name _____ Date _____



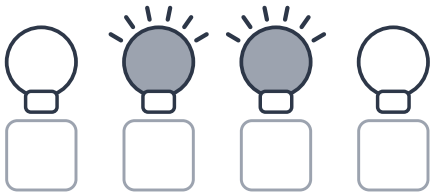
Bits and Bytes

A bit is one 0 or 1. A bulb on is 1, a bulb off is 0.

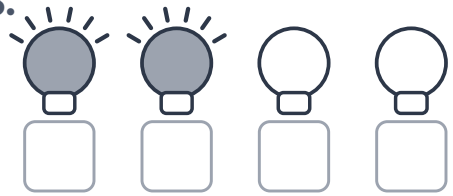
1. Example



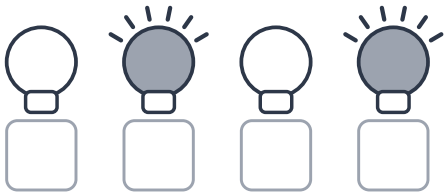
2.



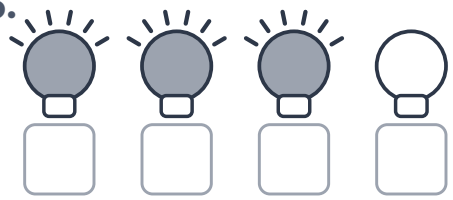
3.



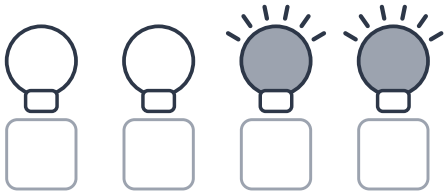
4.



5.



6.



Write all the codes 2 bits can make. One is done.

0 0 ☐☐ ☐☐ ☐☐

Write all the codes 3 bits can make.

0 0 0 ☐☐☐ ☐☐☐ ☐☐☐

☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

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Name _____ Date _____



Bits and Bytes

Each bit you add doubles the codes. 8 bits make a byte.

Bits	1	2	3	4	5	6	7	8
Codes	2	4	8					
	× 2	× 2	× 2	× 2	× 2	× 2	× 2	

1. 8 bits make a byte. How many different codes can one byte make? **256**

Example

2. The smallest number a byte can hold is **0**. What is the biggest? _____

3. How many bits are in **3** bytes? _____

4. How many bits are in **5** bytes? _____

5. How many bytes is **32** bits? _____

6. How many bytes is **72** bits? _____

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Name _____ Date _____



Bits and Bytes

A byte has 8 places, from 128 down to 1. Write each number.

Byte to number

1. 128 64 32 16 8 4 2 1

0 1 0 0 0 0 0 1 = 65

Example

2. 128 64 32 16 8 4 2 1

0 0 1 0 1 0 1 0 = _____

3. 128 64 32 16 8 4 2 1

1 0 0 0 0 0 0 0 = _____

4. 128 64 32 16 8 4 2 1

1 1 0 0 1 0 0 0 = _____

5. 128 64 32 16 8 4 2 1

0 1 1 0 0 1 0 0 = _____

6. 128 64 32 16 8 4 2 1

1 1 1 1 1 1 1 1 = _____

Number to byte

1. 77

128 64 32 16 8 4 2 1

0 1 0 0 1 1 0 1

Example

2. 19

128 64 32 16 8 4 2 1

3. 205

128 64 32 16 8 4 2 1

4. 150

128 64 32 16 8 4 2 1

5. 99

128 64 32 16 8 4 2 1

6. 240

128 64 32 16 8 4 2 1

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Name _____ Date _____

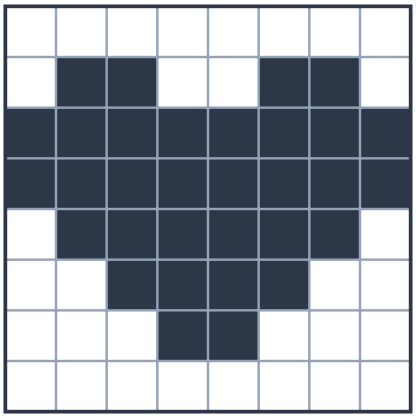


Bits and Bytes

Each row is a byte. Color a square for each 1 to see the picture.

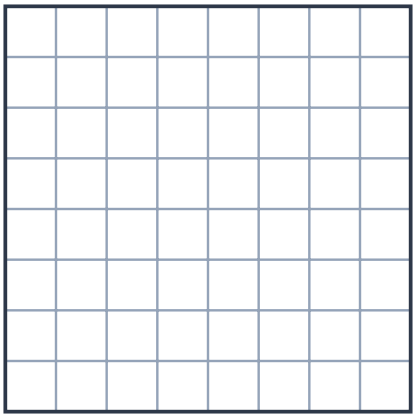
1. Example — **a heart**

00000000
01100110
11111111
11111111
01111110
00111100
00011000
00000000



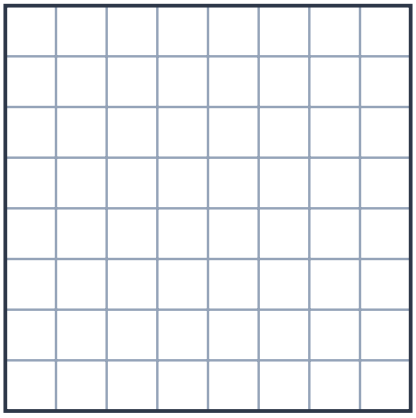
2.

00011000
00111100
01111110
11111111
01000010
01011010
01011010
01111110



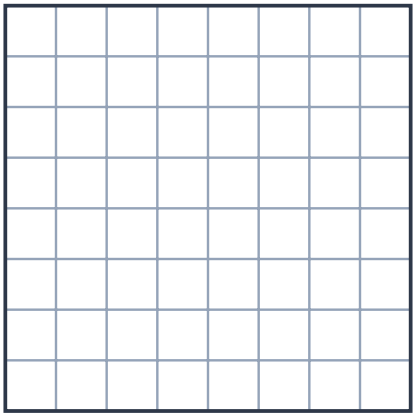
3.

00011000
00111100
01111110
00111100
01111110
11111111
00011000
00011000



4.

00010000
00011000
00011100
00011110
00010000
11111111
01111110
00111100



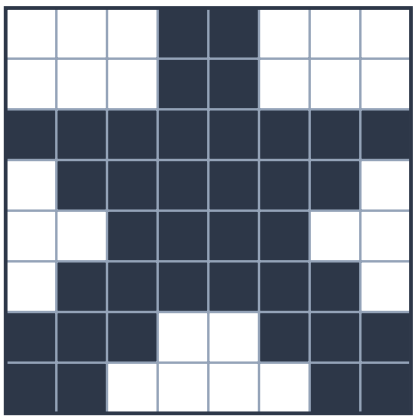
© 2026 Eggroll Games

Name _____ Date _____

Bits and Bytes

Write each row as a byte: 1 dark, 0 white. Then make your own!

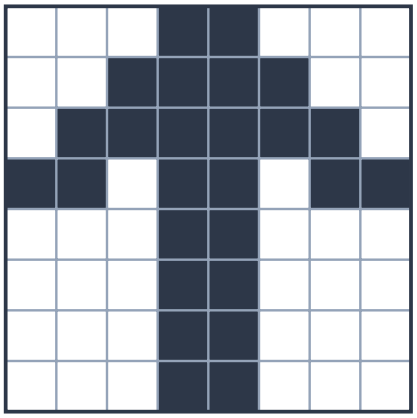
1.



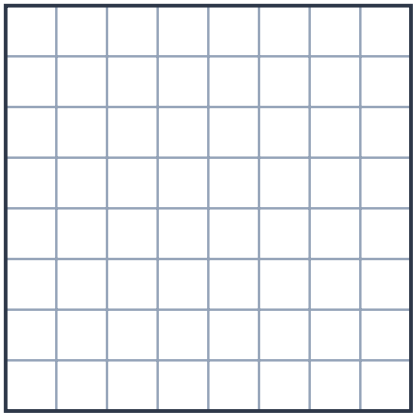
0	0	0	1	1	0	0	0
0	0	0	1	1	0	0	0
1	1	1	1	1	1	1	1
0	1	1	1	1	1	1	0
0	0	1	1	1	1	0	0
0	1	1	1	1	1	1	0
1	1	1	0	0	1	1	1
1	1	0	0	0	0	1	1

Example

2.



3.



Your own picture

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Name _____ Date _____



Bits and Bytes

Computers often store letters as bytes. Decode, then encode.

A	B	C	D	E	F	G	H	I	J	K	L	M
65	66	67	68	69	70	71	72	73	74	75	76	77
N	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
78	79	80	81	82	83	84	85	86	87	88	89	90

Decode: byte, then number, then letter.

1. 01000010 01001001 01010100 — Example
   66 B ___ ___ ___ ___
2. 01000010 01011001 01010100 01000101
   ___ ___ ___ ___ ___ ___ ___ ___
3. 01001000 01000101 01001100 01001100 01001111
   ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

Encode: write the number, then the byte.

4. C ___ A ___ T ___
   ___
5. S ___ N ___ O ___ W ___
   ___

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Name _____ Date _____



Bits and Bytes

Bits and bytes in real life. Solve each story.

1. A computer stores the word SNOW with one byte for each letter. How many bytes is that? How many bits?

4 bytes

32 bits

Example

2. A text message has **18** letters and **3** spaces. Each letter and each space takes one byte. How many bytes?

_____ bytes

3. A tiny black-and-white picture is **8** squares wide and **8** tall, one bit a square. How many bits? How many bytes?

_____ bits

_____ bytes

4. A picture is **16** squares wide and **16** tall, one bit a square. How many bytes does it take?

_____ bytes

5. In a gray picture each square takes one byte, so it can be any of **256** shades. How many bytes for **10** squares by **10**?

_____ bytes

6. A kilobyte is about **1,000** bytes. A story has about **4,000** letters and spaces, one byte each. About how many kilobytes?

_____ kilobytes

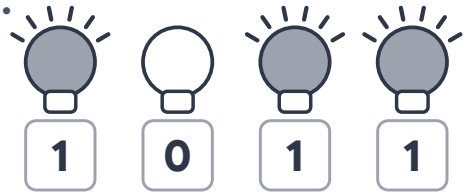
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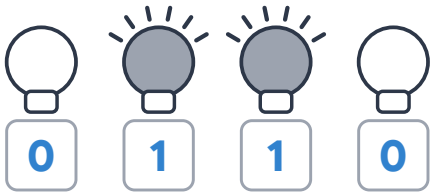
Bits and Bytes

A bit is one 0 or 1. A bulb on is 1, a bulb off is 0.

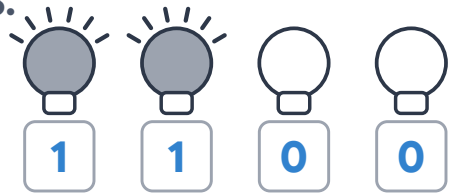
1. Example



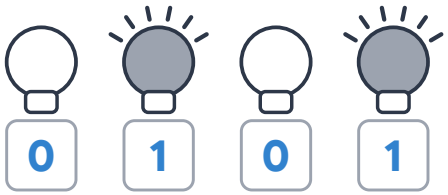
2.



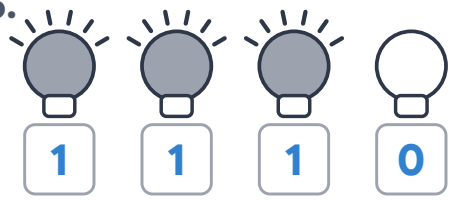
3.



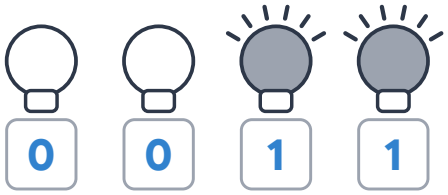
4.



5.



6.



Write all the codes 2 bits can make. One is done.

0 0 | 0 1 | 1 0 | 1 1

Write all the codes 3 bits can make.

0 0 0 | 0 0 1 | 0 1 0 | 0 1 1

1 0 0 | 1 0 1 | 1 1 0 | 1 1 1

The codes may be in any order.

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Bits and Bytes

Each bit you add doubles the codes. 8 bits make a byte.

Bits	1	2	3	4	5	6	7	8
Codes	2	4	8	16	32	64	128	256
	× 2	× 2	× 2	× 2	× 2	× 2	× 2	

1. 8 bits make a byte. How many different codes can one byte make? **256**

Example

2. The smallest number a byte can hold is **0**. What is the biggest? **255**

3. How many bits are in **3** bytes? **24**

4. How many bits are in **5** bytes? **40**

5. How many bytes is **32** bits? **4**

6. How many bytes is **72** bits? **9**

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Bits and Bytes

A byte has 8 places, from 128 down to 1. Write each number.

Byte to number

1. (Example)

128	64	32	16	8	4	2	1	
0	1	0	0	0	0	0	1	= 65

2.

128	64	32	16	8	4	2	1	
0	0	1	0	1	0	1	0	= 42

3.

128	64	32	16	8	4	2	1	
1	0	0	0	0	0	0	0	= 128

4.

128	64	32	16	8	4	2	1	
1	1	0	0	1	0	0	0	= 200

5.

128	64	32	16	8	4	2	1	
0	1	1	0	0	1	0	0	= 100

6.

128	64	32	16	8	4	2	1	
1	1	1	1	1	1	1	1	= 255

Number to byte

1. 77 (Example)

128	64	32	16	8	4	2	1
0	1	0	0	1	1	0	1

2. 19

128	64	32	16	8	4	2	1
0	0	0	1	0	0	1	1

3. 205

128	64	32	16	8	4	2	1
1	1	0	0	1	1	0	1

4. 150

128	64	32	16	8	4	2	1
1	0	0	1	0	1	1	0

5. 99

128	64	32	16	8	4	2	1
0	1	1	0	0	0	1	1

6. 240

128	64	32	16	8	4	2	1
1	1	1	1	0	0	0	0

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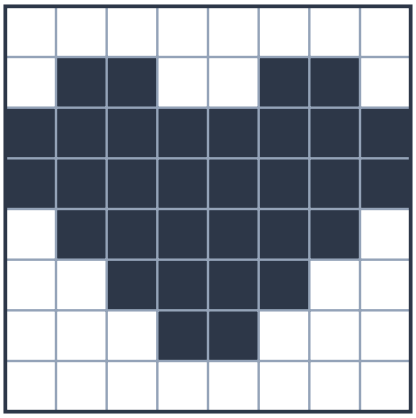


Bits and Bytes

Each row is a byte. Color a square for each 1 to see the picture.

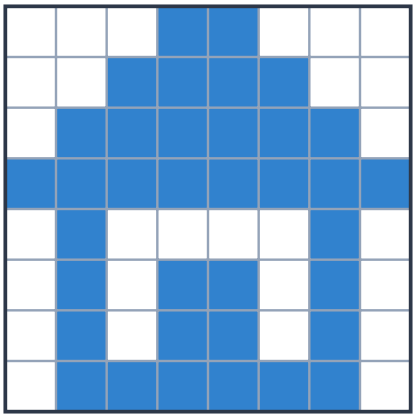
1. Example — **a heart**

00000000
01100110
11111111
11111111
01111110
00111100
00011000
00000000



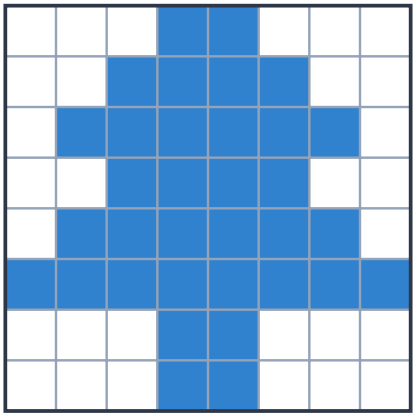
2. **a house**

00011000
00111100
01111110
11111111
01000010
01011010
01011010
01111110



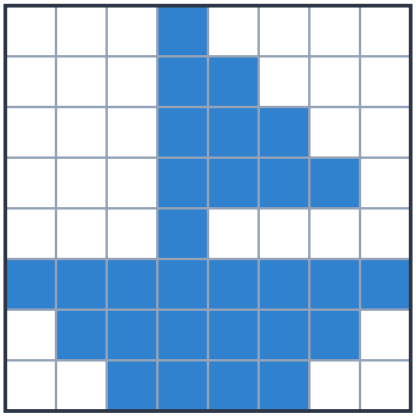
3. **a tree**

00011000
00111100
01111110
00111100
01111110
11111111
00011000
00011000



4. **a sailboat**

00010000
00011000
00011100
00011110
00010000
11111111
01111110
00111100

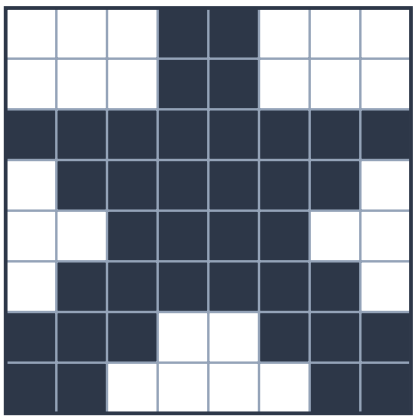


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Bits and Bytes

Write each row as a byte: 1 dark, 0 white. Then make your own!

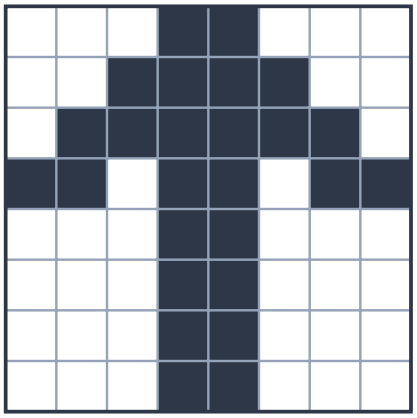
1.



0	0	0	1	1	0	0	0
0	0	0	1	1	0	0	0
1	1	1	1	1	1	1	1
0	1	1	1	1	1	1	0
0	0	1	1	1	1	0	0
0	1	1	1	1	1	1	0
1	1	1	0	0	1	1	1
1	1	0	0	0	0	1	1

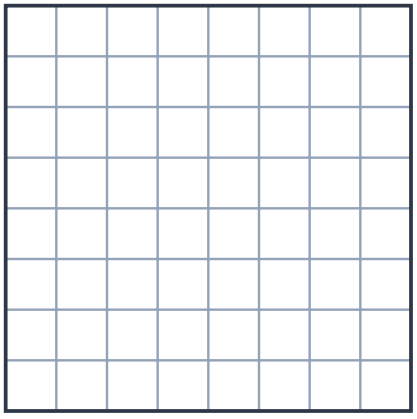
Example

2.



0	0	0	1	1	0	0	0
0	0	1	1	1	1	0	0
0	1	1	1	1	1	1	0
1	1	0	1	1	0	1	1
0	0	0	1	1	0	0	0
0	0	0	1	1	0	0	0
0	0	0	1	1	0	0	0
0	0	0	1	1	0	0	0

3.



Your own picture

Answers will vary.

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Bits and Bytes

Computers often store letters as bytes. Decode, then encode.

A	B	C	D	E	F	G	H	I	J	K	L	M
65	66	67	68	69	70	71	72	73	74	75	76	77
N	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
78	79	80	81	82	83	84	85	86	87	88	89	90

Decode: byte, then number, then letter.

1. 01000010 01001001 01010100 — Example
   66 B 73 I 84 T

2. 01000010 01011001 01010100 01000101
   66 B 89 Y 84 T 69 E

3. 01001000 01000101 01001100 01001100 01001111
   72 H 69 E 76 L 76 L 79 O

Encode: write the number, then the byte.

4. C 67 — 0 1 0 0 0 0 1 1
   A 65 — 0 1 0 0 0 0 0 1
   T 84 — 0 1 0 1 0 1 0 0

5. S 83 — 0 1 0 1 0 0 1 1
   N 78 — 0 1 0 0 1 1 1 0
   O 79 — 0 1 0 0 1 1 1 1
   W 87 — 0 1 0 1 0 1 1 1

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Bits and Bytes

Bits and bytes in real life. Solve each story.

1. A computer stores the word SNOW with one byte for each letter. How many bytes is that? How many bits?

4 bytes

32 bits

Example

2. A text message has **18** letters and **3** spaces. Each letter and each space takes one byte. How many bytes?

21 bytes

3. A tiny black-and-white picture is **8** squares wide and **8** tall, one bit a square. How many bits? How many bytes?

64 bits

8 bytes

4. A picture is **16** squares wide and **16** tall, one bit a square. How many bytes does it take?

32 bytes

5. In a gray picture each square takes one byte, so it can be any of **256** shades. How many bytes for **10** squares by **10**?

100 bytes

6. A kilobyte is about **1,000** bytes. A story has about **4,000** letters and spaces, one byte each. About how many kilobytes?

4 kilobytes

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