



These pages are from the G4 "Patterns Can Transfer Information" journal.



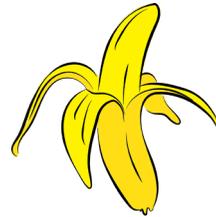
Anything can make a pattern

When Paul Revere saw two, bright signal lanterns hanging in the church steeple, he raced on horseback to notify the American troops that the British approached by sea.



Draw a revolutionary soldier holding up two lanterns as a signal.

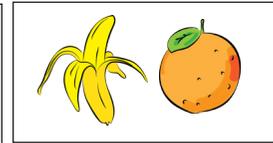
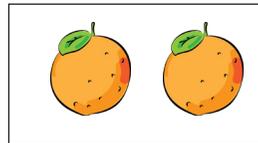
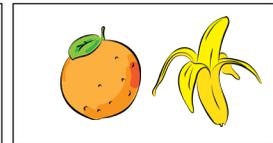
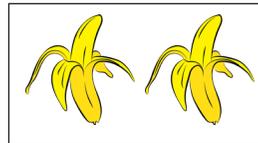
Lantern-lights aren't the only thing that can be used to make a binary pattern. You can make a binary pattern out of any two things. You could make a binary pattern using oranges and bananas.



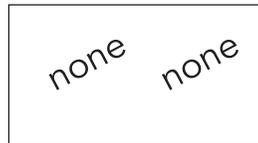
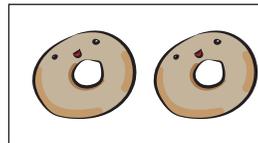
bananaaa!



oraaange!



You could make a binary pattern using breakfast cereal.



Two things make a binary pattern

Because all these pattern are made from only two components, we call them binary patterns. "Bi" means two, such as in the word bicycle. **Binary patterns** are patterns made from only two elements.



There is a "bi" at the beginning of the word bicycle because bicycles have two wheels.



This airplane is called a biplane because it has two sets of wings.

1 1	1 0
0 0	0 1

People commonly make binary patterns using two numbers, "0" and "1".



A code is a meaning for patterns

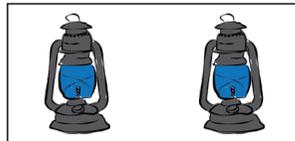
A binary pattern isn't much good all by itself. For the pattern to be useful, you must assign a meaning to each particular pattern. When you assign a meaning to a pattern it is called a **code**. A code that connects a meaning to binary patterns is called **binary code**.

The Binary Lantern Code

Can you figure out why pattern 2 and pattern 3 have the same meaning?

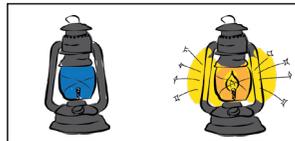


Binary Pattern # 1



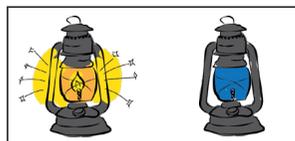
Meaning: The British have not been spotted.

Binary Pattern # 2

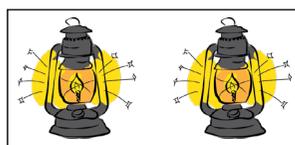


Meaning: The British approach by land.

Binary Pattern # 3



Binary Pattern # 4



Meaning: The British approach by sea.

Binary code is the language of computers. Data and information such as the letters and numbers of your keystrokes are stored as actual binary patterns made from one and zero values stored in a computer's memory. People assign a meaning to each binary pattern to make the code useful.



Make more messages with longer patterns!

Only four messages can be communicated with two lanterns. To make more messages, you could simply add another lantern to your pattern. If you use three lanterns, or three spaces in your pattern, you can make eight unique patterns. With longer patterns you can have more unique meanings in the code.

0101010010110101000101011101

Although this pattern of 1's and 0's is very long, it is still a binary pattern because it is made from only two components: 1's and 0's.

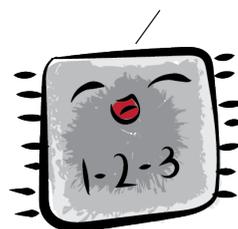
These binary patterns use three spaces

(Pattern 1)	0	0	0
(Pattern 2)			
(Pattern 3)			
(Pattern 4)			
(Pattern 5)			
(Pattern 6)			
(Pattern 7)			
(Pattern 8)			



Find all the possible combinations of ones and zeros that can fill three spaces.

Eight patterns!
Wow! I can do something with that!



I liked it better when there were only four.

