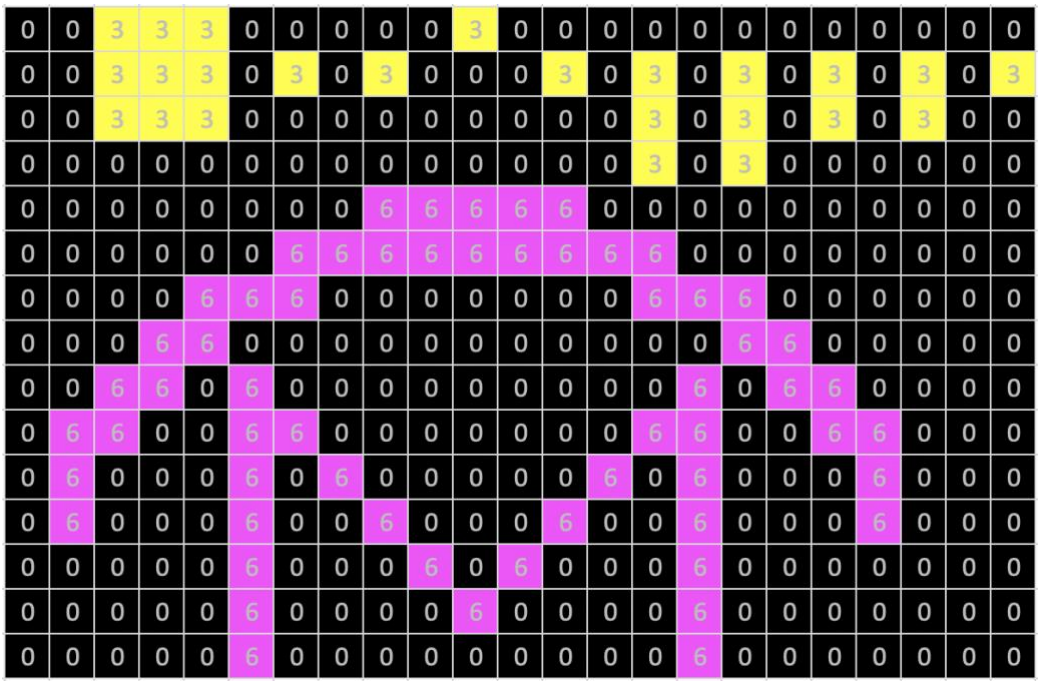
Arecibo Message Pixel Puzzle - SOLUTION

Below is how the picture might look if you chose the same colours as the key: black, yellow and purple. This is a grid of 23 columns and 15 rows (345 pixels / bits)



At the top is a *representation* of our Solar System. On the left is the Sun and then, in order, the planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto. This message was originally sent on 16 November 1974 and at that time Pluto was classified as a planet, so that's why there are nine. If we sent the same message now we'd have to miss off Pluto.

The third planet from the Sun is Earth and it is not in line with the other planets - that tells the reader that "this is the planet where this message came from". Below in purple is a representation of the Arecibo telescope that was used to send this message into space. Earth *does* line up with the middle of the telescope though, that says "this is the telescope used to send the message".

To be very precise *this* coloured version of the Arecibo Message isn't *binary* because it's not just formed of 1s and 0s - we've used extra numbers to give it some colour. The original message was sent as a stream of information by radio waves at very high frequency - too high for humans to hear but just right to be picked up by another radio telescope (if the aliens have one of course!). It was sent in binary with the 1s and 0s sent as slight changes in the radio message. "1s" were sent by tuning the radio frequency upwards, the "0s" by slightly lowering it. A binary message means you can send it in *any* way as long as you have two different ways of saying ON or OFF. You could send the message by two different audio tones, by flashing a torch light on and off, by raising or lowering a flag.

The original message was a long unbroken string of "1s" and "0s" but the *picture* could only be seen by splitting it into a grid with 23 columns and 73 rows. How many bits did the message contain?

Answer: The message contained one thousand, six hundred and seventy nine bits.