

ALL THINGS DIGITAL

# Digital Convergence

When you went online to access **G4T Connect**, you were using technology.

But what is **technology** anyway?

Take a look at the images below. Which of them are **technology**?



Good news! There are no wrong choices, they are all **technology**!

The technologies above help us listen to music, take photos or make payments.

But technology is always changing.

Look at the photos again. Now use the chart below to place them in order from the oldest to the newest, or the least technologically advanced to the most technologically advanced.

★ And here's a clue! You will need to use one item three times!

Technology  
the use of science  
to invent useful  
things or solve  
problems

TECHNOLOGY	LEAST ADVANCED → → → MOST ADVANCED
For listening to music	_____
For making a payment	_____
For taking photos	_____

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# Digital Convergence

How did you do?

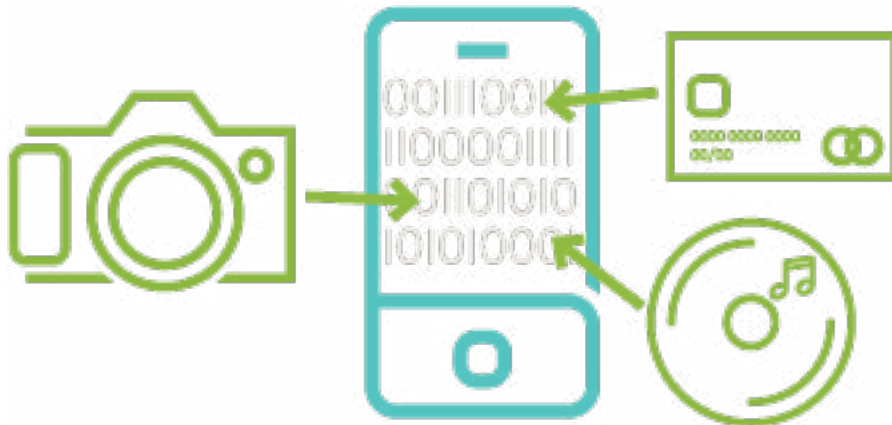
Music technologies went from record → cassette tape → CD → smart phone.  
Photo technology went from tripod → 35 mm camera → digital camera → smart phone  
Payment technologies went from cash → check → credit card → smart phone!

So why did these changes happen? The word is **innovation**.

Innovations can make technology work better, faster or just more easily.

But wait a minute. Why did you list the smart phone three times?  
Because the smart phone helps us listen to music, take photos and make payments.

**Innovation**  
a new idea,  
process or device  
that brings value  
to people's lives



In fact, it can do even more than that.

Innovations make it possible for all of these functions to **converge**, or come together, in one digital device.

We call this **digital convergence**.

How many different things can you do with a smart phone? List them here.

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# Binary Code

But how do so many technologies fit inside one device?

Phones, tablets and computers all speak the same **digital language**.

This language lets them translate all kinds of signals—voice, video, music, text—into digits or numbers.

This language can be sent to other devices that reassemble the digits into the original signal.

This digital language is called **binary code**. Binary means involving two things.

Binary code uses two numbers—0 and 1.

At the most basic level, a computer sees everything as an electrical signal that is either **off** or **on—0** or **1**.

Now try putting your own name into Binary Code!

```
0100111010
1000100011
1101000011
0101110010
0101000101
1111010101
011 010011
1010100010
0011110100
0011010111
0010010100
0101111101
0101011 01
```

**Binary Code**

**Binary Code**

**Binary Code**

**Binary Code**

**A** 01000001

**H** 01001000

**O** 01001111

**V** 01010110

**B** 01000010

**I** 01001001

**P** 01010000

**W** 01010111

**C** 01000011

**J** 01001010

**Q** 01010001

**X** 01011000

**D** 01000100

**K** 01001011

**R** 01010010

**Y** 01011001

**E** 01000101

**L** 01001100

**S** 01010011

**Z** 01011010

**F** 01000110

**M** 01001101

**T** 01010100

**G** 01000111

**N** 01001110

**U** 01010101

Hello, my name is

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# Biometrics

Digital technology lets you do all kinds of things on your phone, including pay for things.

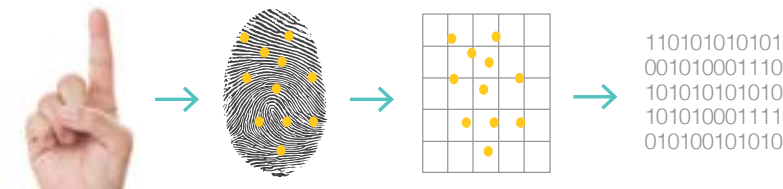
But it's important that only *you* are able to do that.

There needs to be a way to **authenticate** you—to make sure that you are YOU!

**What are some things about you that are unique to only you?  
Write or draw them here.**

**Authenticate**  
to prove something to be true or genuine, to verify a user's identity

If you said, your fingerprint, you are correct!



This is called **biometrics**.

The fingerprint becomes a set of data points.

These get digitized into binary code, which translates into a kind of password.

The measurements of your face—a selfie—can also be used.



**Biometrics**  
the measurement of unique characteristics, especially to identify personal identity

Information unique to you is digitized and used to **authenticate** that you are you!

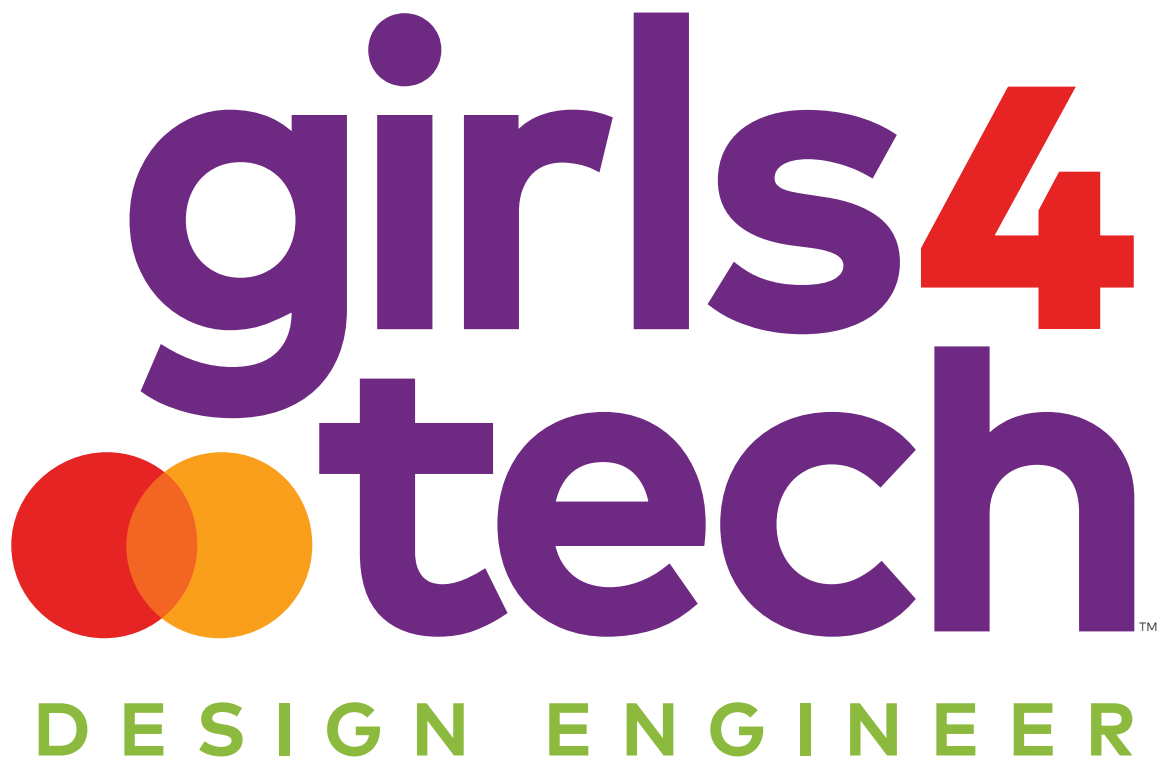
What digital technologies will *you* innovate in the future?

**You are a Girls4Tech Design Engineer!**

CERTIFICATE OF ACHIEVEMENT

Congratulations!

YOU ARE A CERTIFIED



A handwritten signature in black ink, appearing to read "Michael Miebach".

**Michael Miebach**  
CEO, Mastercard

A handwritten signature in black ink, appearing to read "Susan Warner".

**Susan Warner**  
Founder, Girls4Tech