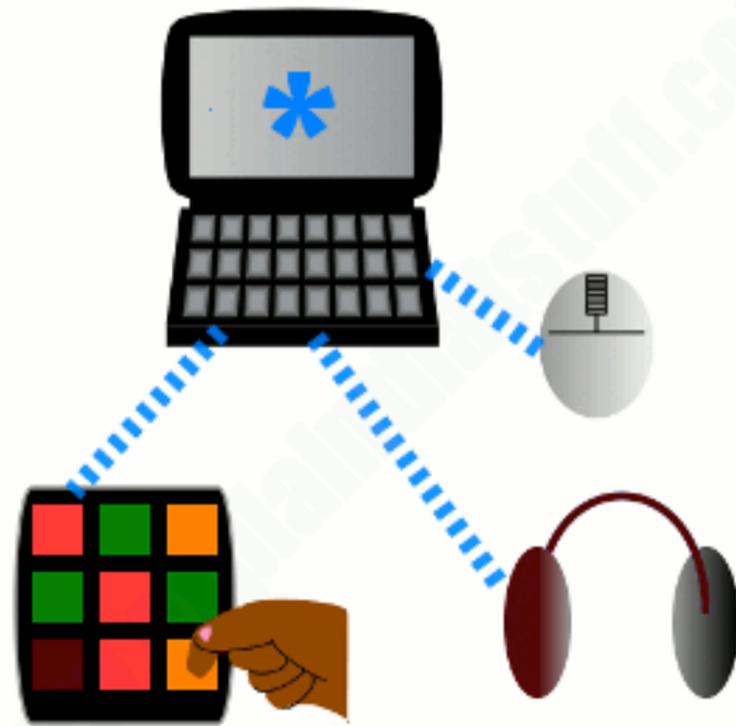


# **What is Bluetooth ?**

**& How does Bluetooth work?**

**29th October 2021**

# Bluetooth®



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Is there anything worse than wires? If you've ever hooked up a computer and half a dozen peripherals (add-ons), a digital television and a DVD player, or run your own telephone extensions through the house, you'll know just what a pain all those cables can be.

Wouldn't it be nice if there were a way of bringing electronic gadgets together so they could share whatever signals they need without any wires at all?

Enter **Bluetooth**! It's a simple way for cellphones, printers, PCs, digital cameras, and other gadgets to link together over relatively short distances using wireless (radio wave) technology.

The curious name comes from Harald Bluetooth, a Danish king who united the Scandinavians in the 10th century. Will Bluetooth unite the electronic world the same way? Let's take a closer look!

A typical use of Bluetooth: connecting a full-sized keyboard to a tablet or smartphone.

Wireless connections like this are particularly useful when you're using portable gadgets, maybe on a train or a plane, and cables would really get in the way.



# What is Bluetooth?

We're all use to wireless communication by now, even if we don't always realize it. receivers and sets pick up programs beamed in radio waves hundreds (possibly even thousands) of km/miles through the air.

Cordless use similar technologies to carry calls from a handset to a base station somewhere in your home.

If you use Wi-Fi (), your computer sends and receives a steady stream of data to and from a router that's probably wired directly to the Net.

All these technologies involve sending information back and forth not along cables but in radio waves buzzing invisibly through the air.

Bluetooth is a similar radio-wave technology, but it's mainly designed for communicating over short distances less than about 10m or 30ft.

Typically, you might use it to download photos from a to a , to hook up a wireless to a laptop, to link a hands-free headset to your so you can talk and drive safely at the same time, and so on. gadgets that work this way have built-in radio (transmitters and receivers) so they can simultaneously send and receive wireless signals to other Bluetooth gadgets.

Older gadgets can be converted to work with Bluetooth using plug-in **adapters** (in the form of USB sticks, PCMCIA laptop cards, and so on).

The power of the transmitter governs the range over which a Bluetooth device can operate and, generally, devices are said to fall into one of three classes: class 1 are the most powerful and can operate up to 100m (330ft), class 2 (the most common kind) operate up to 10m (33ft), and class 3 are the least powerful and don't go much beyond 1m (3.3ft).

Bluetooth sends and receives radio waves in a band of 79 different frequencies (**channels**) centred on 2.45 GHz, set apart from radio, [television](#), and cellphones, and reserved for use by industrial, scientific, and medical gadgets.

Don't worry: you're not going to interfere with someone's life-support machine by using Bluetooth in your home, because the low power of your transmitters won't carry your signals that far!

Bluetooth's short-range transmitters are one of its biggest plus points.

They use virtually no power and, because they don't travel far, are theoretically more secure than wireless networks that operate over longer ranges, such as Wi-Fi.



Bluetooth devices automatically detect and connect to one another and up to eight of them can communicate at any one time. They don't interfere with one another because each pair of devices uses a different one of the 79 available channels.

If two devices want to talk, they pick a channel randomly and, if that's already taken, randomly switch to one of the others (a technique known as spread-spectrum frequency hopping).

To minimise the risks of interference from other electrical appliances (and also to improve security), pairs of devices constantly shift the frequency they're using—thousands of times a second.

When a group of two or more Bluetooth devices are sharing information together, they form a kind of ad-hoc, mini [computer network](#) called a piconet.

Other devices can join or leave an existing piconet at any time.

One device (known as the master) acts as the overall controller of the network, while the others (known as slaves) obey its instructions.

Two or more separate piconets can also join up and share information forming what's called a scatternet.

# What is spread spectrum?

Spread-spectrum was designed for use in wartime to stop jamming of radio signals between warships and the torpedoes they fired.

Suppose you're talking to a friend on a [walkie-talkie](#) or with a CB (citizen's band) radio, but there are other people using the same frequency and your conversation keeps getting interrupted. What can you do? Most experienced radio users know the answer: you both change to a different frequency (band) and resume your conversation there. And you can keep on switching band until you find a place where you can happily talk without interruption.



Why can't they simply switch to another frequency automatically to prevent interference and eavesdropping?

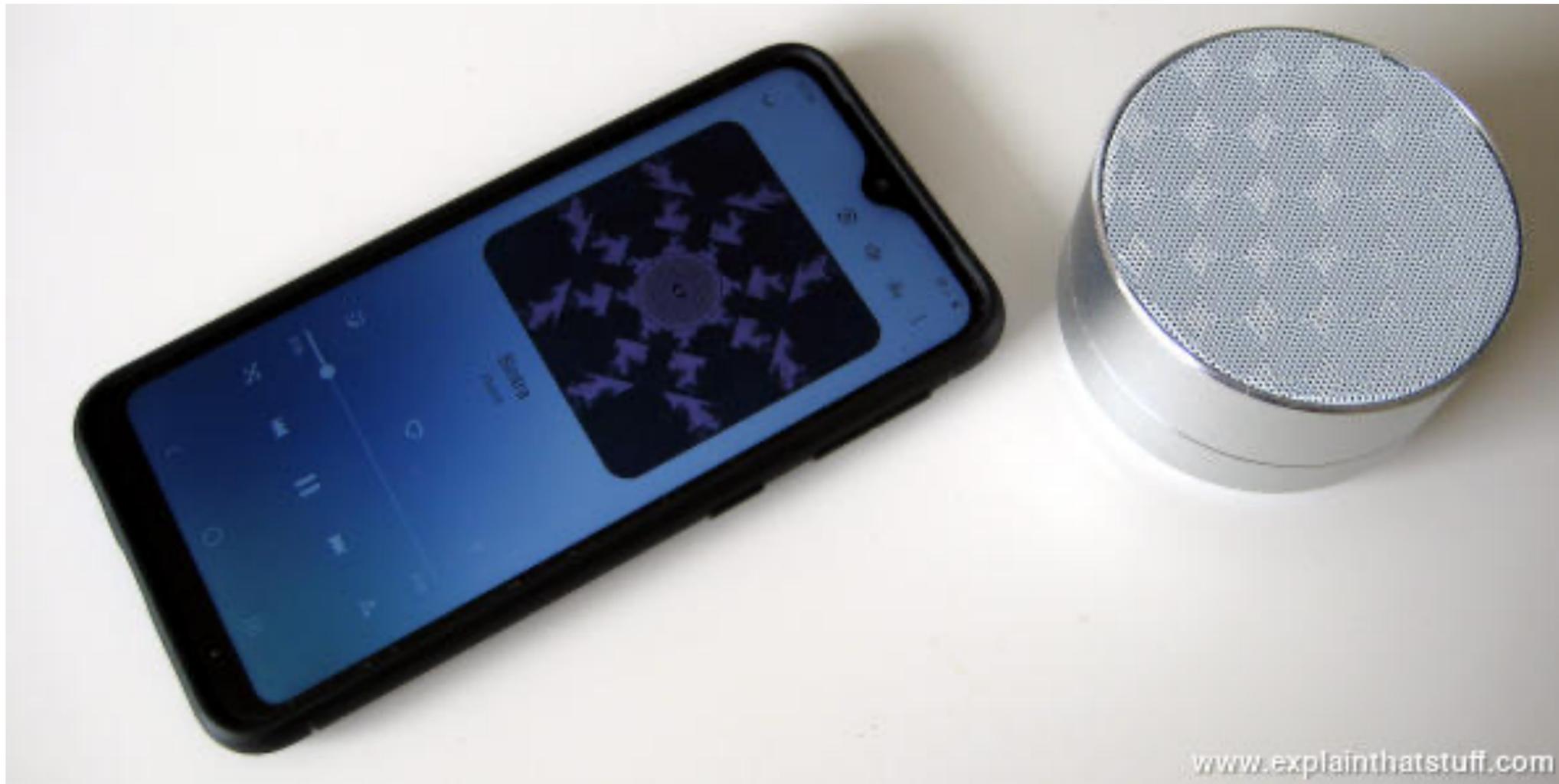
This is the basic idea behind a technique called **spread-spectrum frequency hopping**, where signals are rapidly and randomly switched across a wide range of different frequencies to improve the security and reliability of wireless communication.

## Who invented it?

Numerous inventors contributed to the invention of spread-spectrum, including electricity pioneer [Nikola Tesla](#) (1856–1943) and US actress [Hedy Lamarr](#) (1913–2000), who, with the help of George Antheil, developed a practical system for the US military during World War II.

While modern spread-spectrum systems are electronically controlled, Lamarr's was based on the mechanical, punched paper-tape technology originally used in [player pianos](#).

# Connecting a wireless phone to a wireless speaker with Bluetooth.



# Is Bluetooth better or worse than Wi-Fi?

People often get confused by Bluetooth and Wi-Fi because, at first sight, they seem to do similar things. In fact, they're very different.

Bluetooth is mainly used for linking computers and electronic devices in an ad-hoc way over very short distances, often for only brief or occasional communication using relatively small amounts of data.

It's relatively secure, uses little power, and connects automatically. Wi-Fi is designed to shuttle much larger amounts of data between computers and the Internet, often over much greater distances.

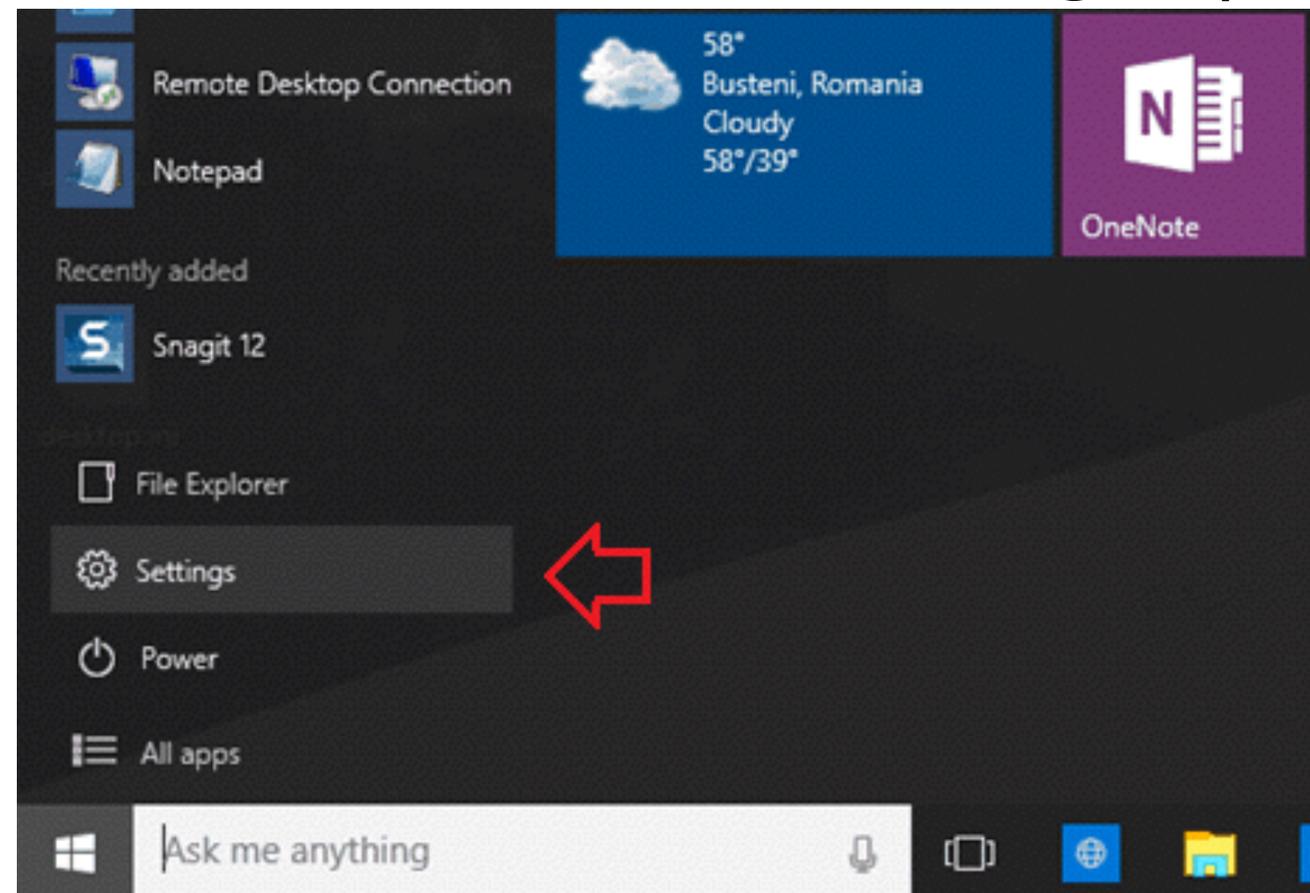
It can involve more elaborate security and it generally uses much higher power. Bluetooth and Wi-Fi are *complementary* technologies, not rivals, and you can easily use both together to make your electronic gadgets work more conveniently for you!

# How to Connect a Bluetooth Device in Windows 10

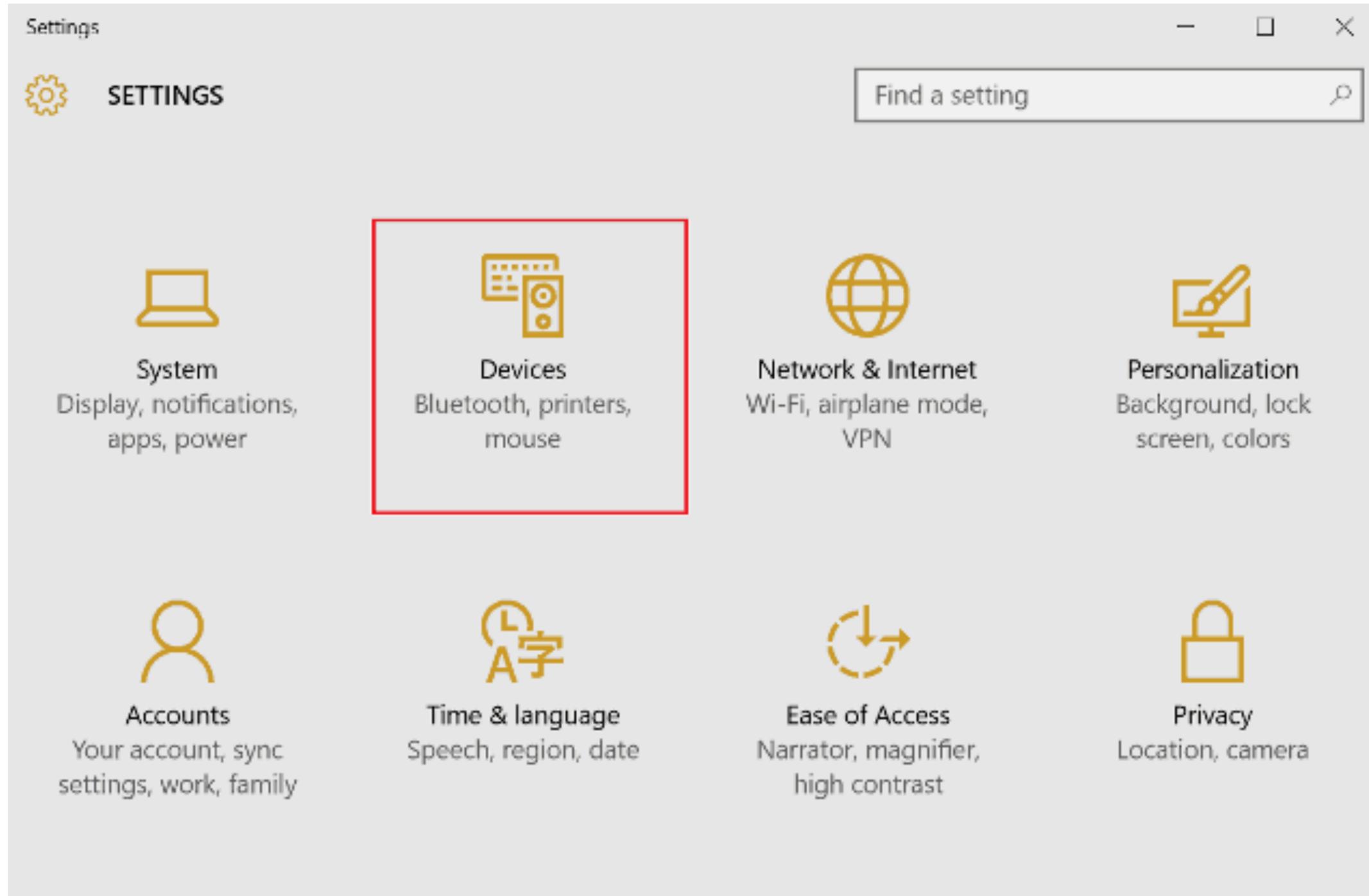
Connecting Bluetooth devices to Windows 10 PC is one of the simplest tasks, but most of the Windows users who have recently [installed Windows 10](#) on their new Computer or simply upgraded to [Windows 10](#) from the [previous versions of Windows](#) are still unknown with the exact process of **connecting Bluetooth in Windows 10** computer.

## Find Bluetooth Settings in Windows 10

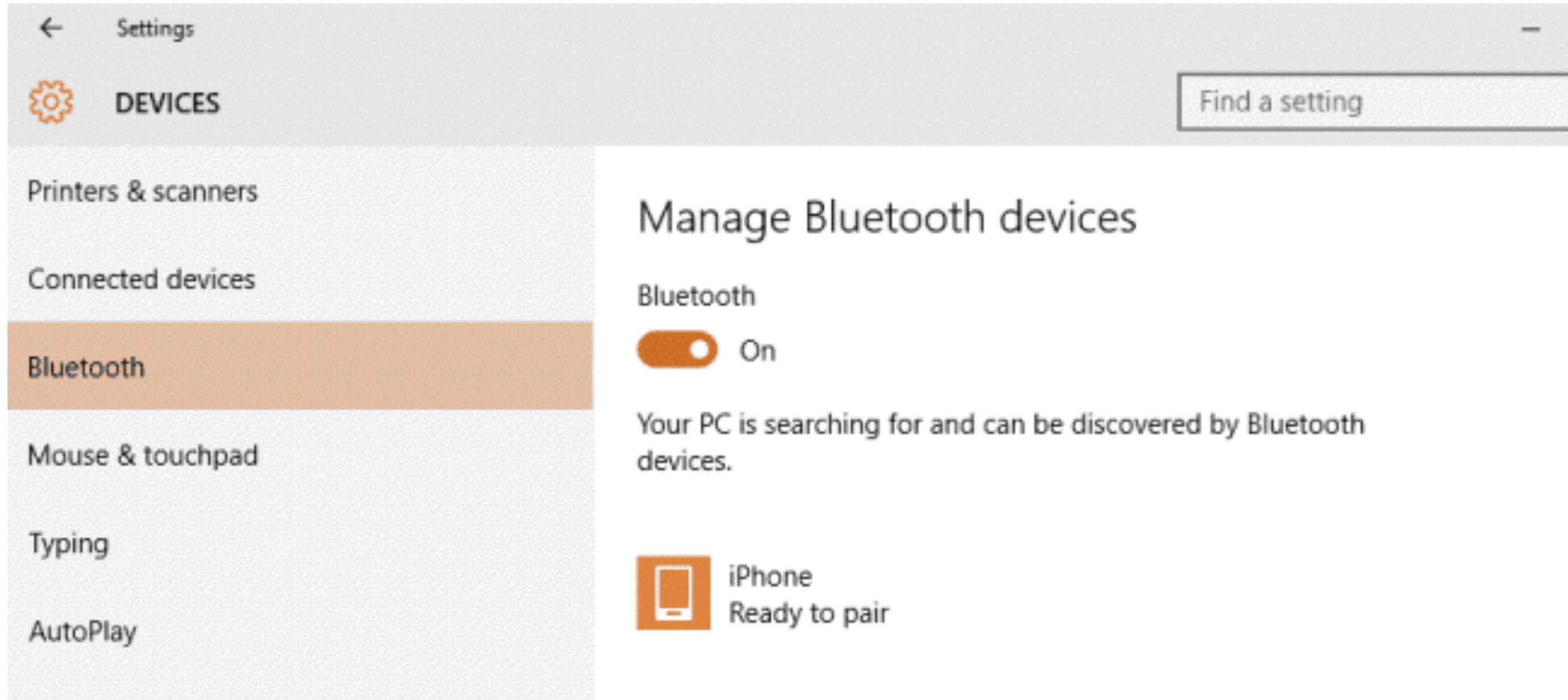
**Step (1):** First of all, click **Start** menu and select **Settings** option to open Settings app.



**Step (2):** From the settings app page, select **Devices** option.

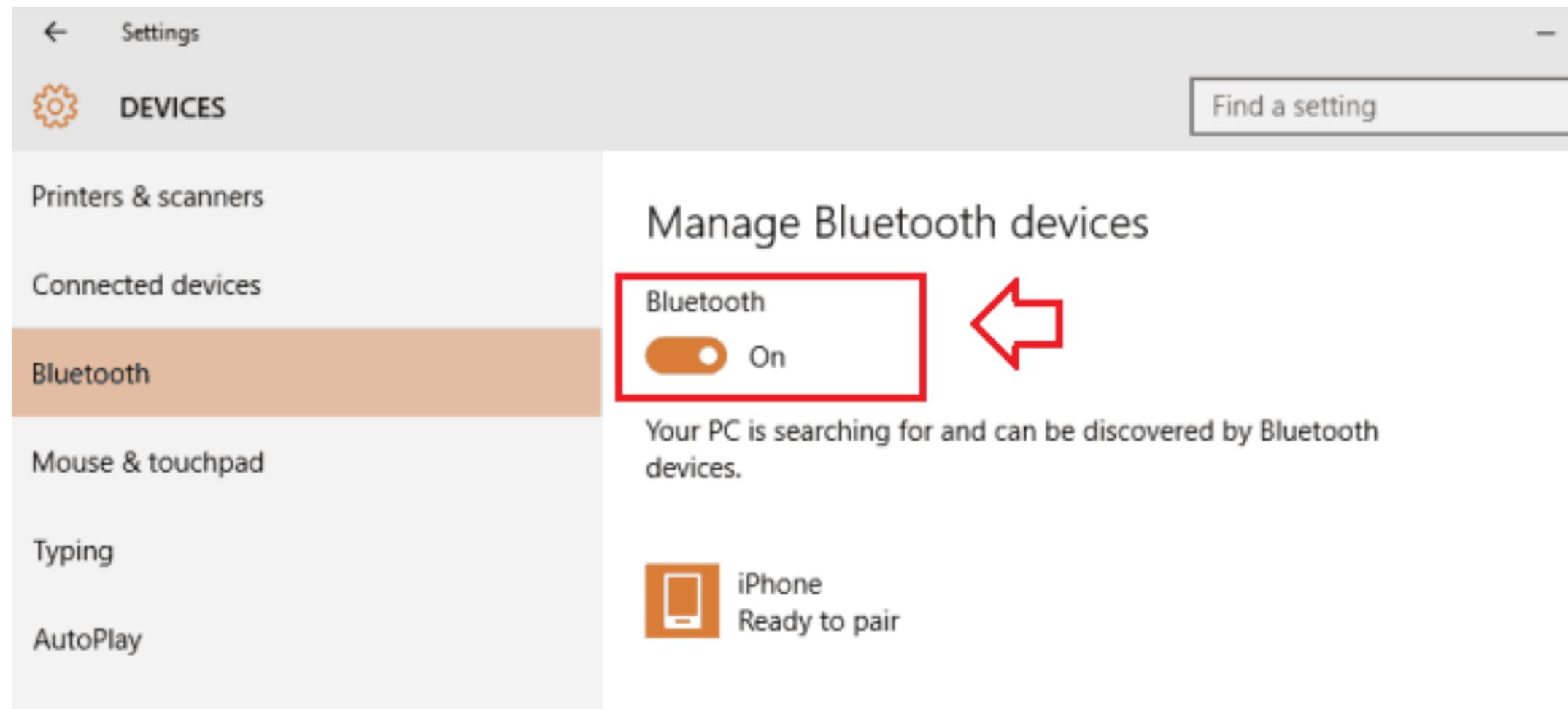


**Step (3):** After that, simply select **Bluetooth** option from the Devices section.

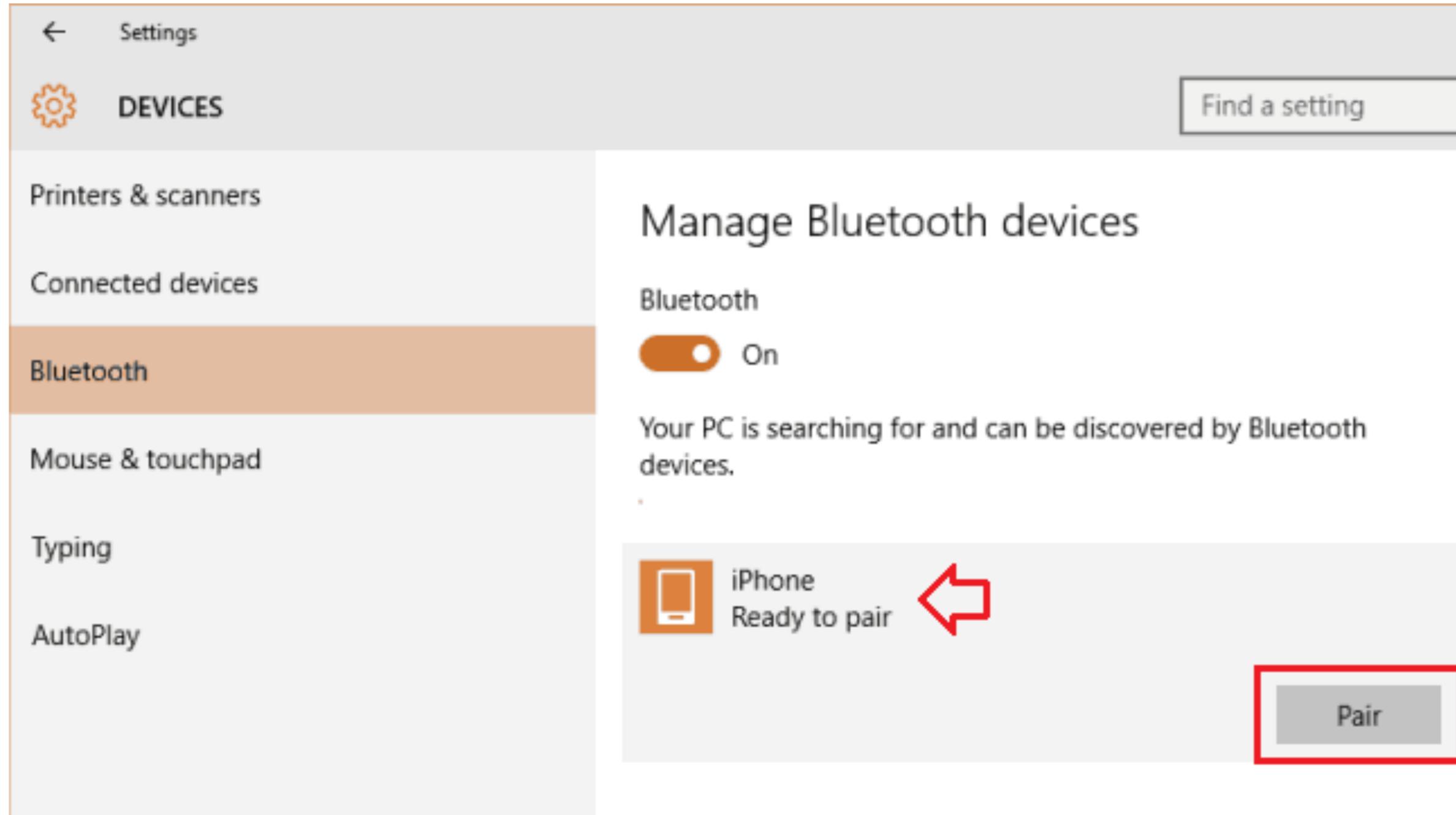


**Step (4):** Once you found the **Bluetooth settings** in Windows 10, now follow the below mentioned instructions in order to connecting Bluetooth device to your PC:

**Step (5):** At first, make sure that Bluetooth is turned **ON** and **the device is waiting to Pair** ( Generally hold down the power on button)

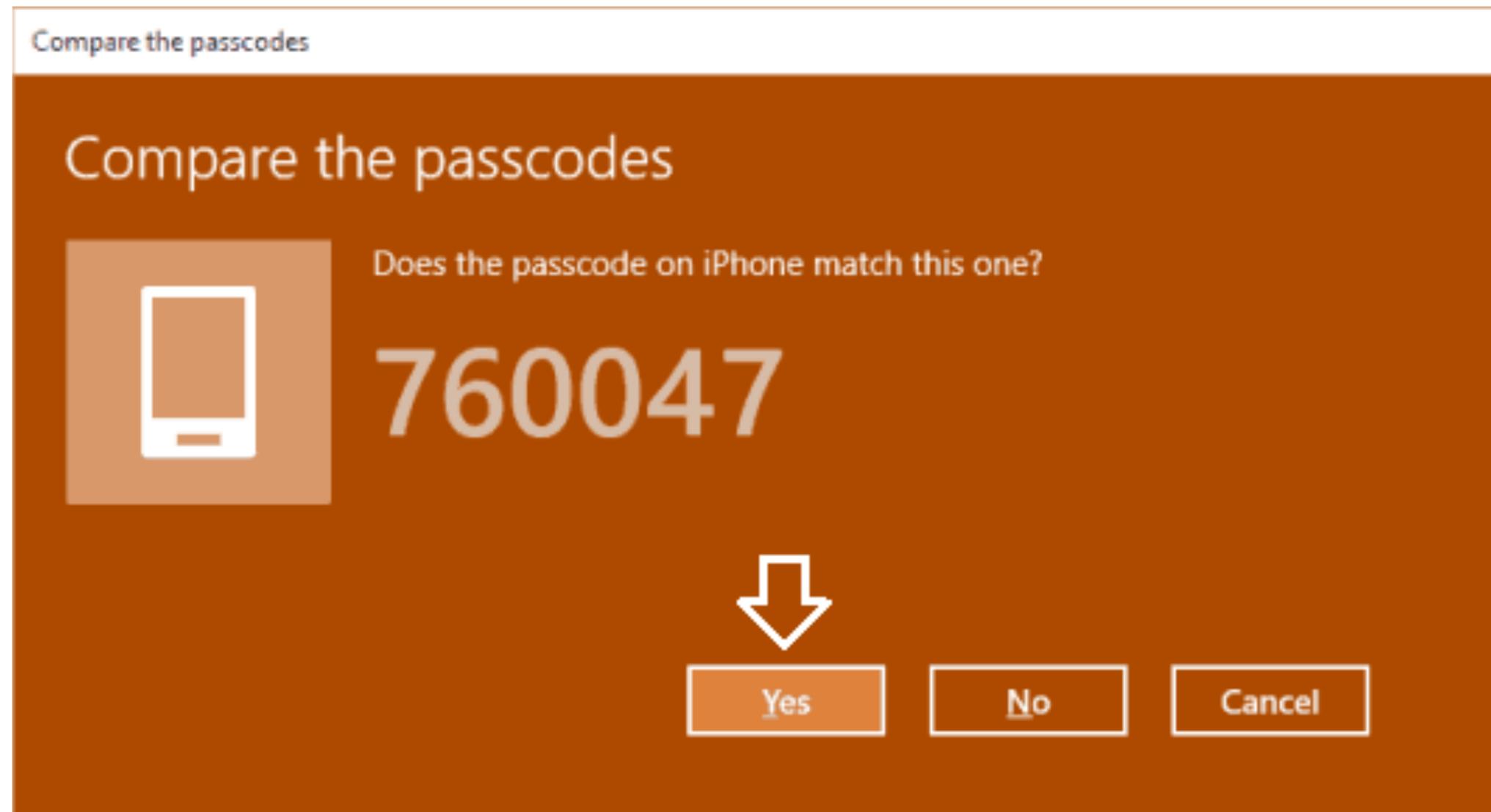


## Step (6): Now, select the device and click Pair button.



**Step (7):** To complete the pairing Bluetooth devices, an authentication prompt will appear on your screen.

**Step (8):** You will be asked to enter the shown passcodes, so simply enter the exact **passcodes** and click **Yes** button to confirm the authentication process.



**Step (9):** Once all these things done properly, you will be able to see the list of all connected Bluetooth devices in Windows 10.