# Make a business card with NFC



Hold to your cell phone to learn more!

**Antenna**

**NFC Chip**

This NFC card uses inductive coupling and radio waves to send data

MAKING WAVES with radio

radioeverywhere.org

DRL-2053160

## Overview

Business cards are useful for sharing your contact information when looking for an internship, jobs or networking in a professional setting. To make your business card extra fancy, you can add wireless capabilities using an NFC tag. This tag can trigger a mobile phone to instantly bring up additional information, such as your portfolio, contact details, or social media profiles. By integrating modern technology with a traditional business card, you can create a more effective way to share your information with others.

## Learning Objectives

1. Radio Frequency Identification or RFID is a wireless technology that uses radio to send information one-way.

2. Near Field Communication (NFC) can be used in one or two-way communications to send and receive a small bit of data using inductive coupling and a powered device.

3. Data is stored on a microchip, a small electronic component made from silicon, which is commonly found in NFC tags and other modern technologies.

## Materials

- Rewritable RFID tags / stickers with Ntag213, Ntag215, or Ntag216 chips
- Avery Printable Business Cards (#5371) or 8.5" x 11" cardstock
- Printer
- Mobile phone with NFC enabled and an NFC app installed

## Activity Procedure

Refer to the "NFC Business Card Production Process" document for a visual information guide.

**Design the Card**

1. Design your business card using a drawing program, Microsoft Word template (like an Avery Printable Business Card template), Adobe InDesign, Adobe Illustrator, Figma, Canva, or other layout software.

2. Print the cards out. Place cardstock into your own printer or consider printing at a place like Staples or Office Depot.

3. Peel and stick your NFC tag onto your business card.

**Program the Card's NFC tag**

Now it's time to program your tag with a web address of your choice!

4. Download the **NFC tools** app onto your mobile phone. Click on "Write".

5. Click "Add a record"

6. Click "URL/URI"

7. Type in the website URL, then click "OK"

8. Click "Write"

9. Place the NFC tag near the NRC scan area of your phone

10. The check mark on the phone screen shows that your NFC chip is programmed!

**Testing the NFC tag**

11. Enable the NFC function on your Android phone by going to Settings. For iOS, NFC is automatically turned on.

12. Find the NFC reader on your phone. For Android phones, the NFC reader is found in the middle-back of the phone. For Apple iPhones, this is located at the center-top-rear.

13. Tap the NFD tag with your phone. The web address should appear!

## Content Background

Radio waves come in many different frequencies, and one type of radio wave technology is called Near Field Communication (NFC). NFC operates at a frequency of 13.56 MHz and works over a short range, typically up to 5 centimeters. It is commonly used to send small amounts of data wirelessly, between an NFC tag and a powered NFC reader, such as a cell phone.

An NFC tag has an antenna, made of a thin conductive material like copper, and a microchip that stores data. When the tag comes near an NFC reader, the reader generates a small electromagnetic field that energizes the NFC tag, allowing the microchip on the NFC tag to transmit stored data. The NFC reader can also write new data to the tag's microchip using an app or other tools on an NFC-enabled device.

NFC is a modern example of a Radio Frequency Identification (RFID) technology, but it enables more secure and versatile data exchanges over short distances. This makes NFC tags useful for applications like mobile wallets, contactless payments, library books, and bus tickets, where secure, short range communication is important.

## List of Terms Related to this Activity

**Frequency:** This describes an electromagnetic radio wave that oscillates in a set amount of time. When talking about waves, frequency refers to how many waves pass through a fixed point in a set amount of time, usually a second. The unit of frequency is hertz (Hz), where 1 Hz means one wave per second.

**Microchip:** Also known as a chip or an integrated circuit, this is a tiny electronic device made from silicon. It contains multiple electronic components etched into a single piece of silicon and is used to store and process data.

**NFC (Near Field Communication):** A short range wireless technology that can transmit data at a speed of 424 kilobits per second. NFC operates over distances up to 5 centimeters. It enables devices to send and receive small amounts of data wirelessly.

**NFC tag:** This is a small sticker tag with a coiled antenna and a microchip with rewritable memory. When placed near an NFC reader, the tag is powered by the readers' electromagnetic field and can transmit stored data or have new data written on it