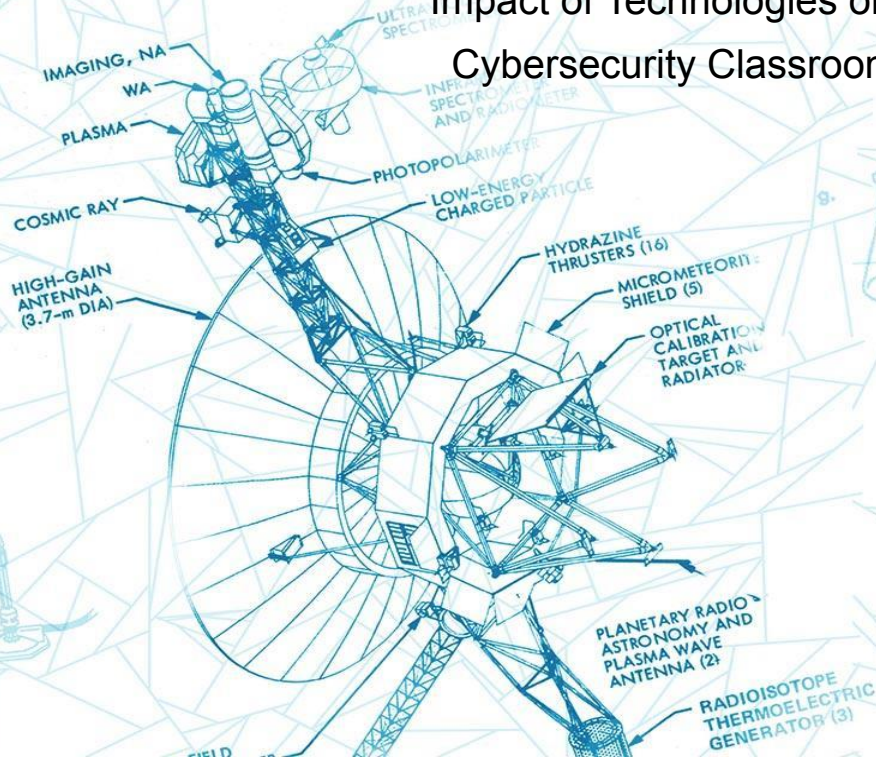
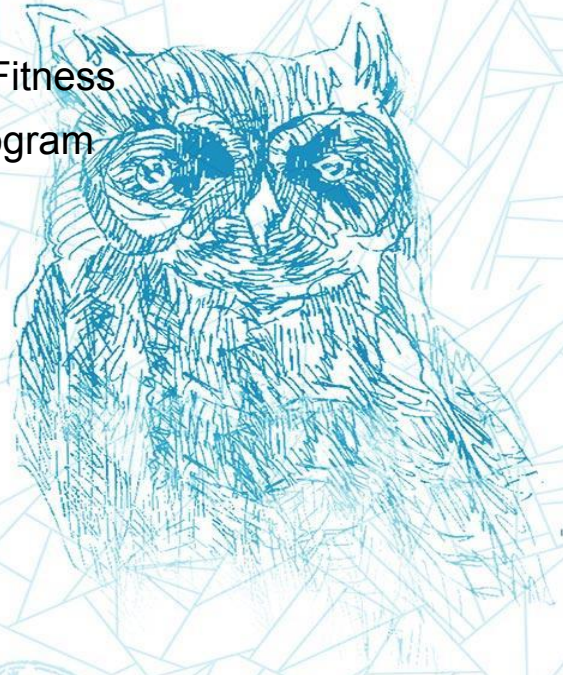


# Health and Fitness

Impact of Technologies on Health and Fitness  
Cybersecurity Classroom Training Program





# Module purpose

This module has been created to help students and teachers explore health and fitness through the evolution of technology in those fields.

A goal of the module is to explore these new technologies through different subjects, references, and activities.

**Science Module:** Section 1 - Discovery (Cont.) ([1](#)) ([2](#)) ([3](#)) | Section 1 - Evidence (Cont.) ([1](#)) ([2](#)) | Section 2 - Current Events (Cont.) ([1](#)) ([2](#)) |

“The knowledge and skills acquired in health education and physical education form an integrated whole that relates to the everyday experiences of students and provides them with the physical literacy and health literacy they need to lead healthy, active lives.”

Ontario Curriculum

# Module activities

→ [Activity 1](#) - Device or app presentation for active and healthy living

# Devices and apps

Health apps, services, and devices are a growing segment of the economy. Some of these devices and services can be used along your regular active lifestyle, but others intend on completely replacing a gym membership for example. The bigger competitors in the market are, like many other well-known tech companies, offer expensive devices and recurring subscriptions.

READING: [Health tracking tech revenue to reach \\$13B this year amid sustained consumer demand](#)  
by Rebecca Pifer

The benefit of having a wide amount of active and healthy living services means that people can find something that will be best for them. This includes video examples, classes, personal training help, meal planning, gamification and encouragement tools, etc.

The fact that these services are investing so much in creating this content. It makes sense as this market is growing especially with people becoming more health conscious.

READING: [The Best Workout Apps for 2021](#) by Jill Duffy

# Devices and apps (Cont.)

Some of the world's largest companies like Apple and Qualcomm are releasing new products multiple times a year. These new products are typically released with incremental upgrades when compared to the previous versions. Qualcomm is currently integrating health technologies in the smartphone's processor which will be more than an incremental upgrade. Sonde Health, a software company that uses machine learning, will collaborate with Qualcomm to offer health notices on your smartphone based. They will offer an analysis of your health based on your voice.

[Apple Watch 6 - Are the Health Features WORTH IT? A Doctor's Opinion.](#) by Christy Risinger, MD



READING: [Sonde Health Vocal Biomarker Technology Optimized on Qualcomm Snapdragon Mobile Platforms](#) by Business Wire

Meanwhile, Apple keeps adding features to the most popular [wearable tech device](#) in the world the Apple Watch. Are these features useful? Are they reliable metrics of your health?

# Benefits of technology and health

Services like [Peloton](#) create engagement through high quality interactive content. Their content uses leaderboards, competition, and [gamification](#). This is one of the benefits of technology to create engagement by users in healthy active living.

EXPERIENCE: [Get ready to sweat as cult fitness platform Peloton arrives in Australia](#) by Alice Clarke

There are limitations to services like these as they may not be accessible to everyone. It remains a fact that high speed internet, smartphones, and specifically designed devices for each service are luxuries to many. Services like Peloton are available to those with more money. There are no doubts that it is a good and high quality fitness service, but mostly accessible to a very specific audience.

GAMIFICATION: [Peloton's new game is an unlikely mix of spinning and Guitar Hero](#) by Cat Ellis



# Disadvantages and dangers of technology and health

Smart health devices track many interesting details, like your heartbeat, blood oxygen level, steps taken, a ECG signal, but should you be worried about sharing or losing this information? In the wrong hands, these data points might be harmful. Obviously, you may be interested in having the details to track your health and training, but big-business is interested in your data.

- **Inevitability:** Common and ethical use of health data is a boundary that we will need to cross as a society.
- **Privacy:** Do you want Amazon, Facebook, Google, or Apple to watch you in your your house? What about in your bedroom?
- **Usefulness:** Are you comfortable with insurance companies having access to your data? What about your government(s)?

READING: [Does Amazon's Sleep Tracking Technology Invade Bedroom Privacy? Concerns Raised About Data Sharing, Opacity of Intentions for Collected Information](#) by  
Scott Ikeda



# Risks to your data

What happens when life insurance companies track fitness data? We already have car insurance plans with discounts for using a tracking device. With the GPS data from the device, the company can adjust your discounts based on your driving habits, the neighbourhoods where you parked your car, etc.

Insurance experts believe the next step will be to have the same approach for people and their health. To track their fitness level, their eating habits, their vitals, etc.

QUOTE: “customers can earn discounts in many ways, including taking online nutrition classes, going to the doctor, and, of course, wearing a tracker and meeting predetermined fitness goals”  
[What happens when life insurance companies track fitness data?](#) by Angela Chen

With tech and data tracking becoming more and more portable it is easier to have those devices as part of our lives. Will we have a choice? Can we avoid these changes? Whether we want it or not, we will need to answer these questions soon enough.

# Risks to your data (Cont.)

What could happen with all the fitness, health, and other data being tracked?

READING: [Hacker gang behind Garmin attack doesn't have a history of stealing user data](#)  
by Catalin Cimpanu

- Some of your data may be sold legally (sometimes without your explicit knowledge), likely the details of these transactions are in the fine print page you never read.

A sample of companies with which PayPal shares user data:

**Payment processors** (Bank of America, Wells Fargo, American Express, JPMorgan Chase, India's Chargebee, Russia's VTB24, Pakistan's Bank Alfalah Ltd., and others)

**Auditors** (PricewaterhouseCoopers, KPMG and others)

**Credit and fraud agencies** (Experian, Equifax, Russia's National Credit Bureau, Cyprus' Au10tix and others)

**Financial product providers** (such as Santander UK, Deloitte, France's La Poste, BNP Paribas, and others)

**Commercial partners** (Stubhub, Apple, DHL, UK's Royal Mail, Bulgaria's TELUS, Facebook, and others)

**Marketers and publicists** (such as Salesforce, Edelman PR, LinkedIn, Google, Poland's Clue PR, Google, Pandora)

**Operational service providers** (Mailchimp, eBay Enterprise, Amazon Web Services, Salesforce, Google, and others)

**Other commercial partners** (such as several eBay units, Korea's M3 Mobile, Ireland's Kijiji International and Epinions)

**Legal entities** (Altep, Consilio, eTERA, Avansic, Deloitte Touche Tohmatsu Ltd., Superior Review and others)

**Government agencies** (such as the European Consumer Centre Network, various data protection agencies in Europe)

**PayPal's own internal units**

READING:  
[Your Data Is Shared and Sold...What's Being Done About It?](#)



# Risks to your data (Cont.)

- Your data may be stolen and sold illegally through the [dark web](#).

READING: [How much is your personal data worth on the dark web?](#) by Amer Owaida

We may not like the fact that our data from our social media and smartphone use is being sold for financial gains. Fortunately, we often gain many conveniences why sharing this data with the various services we use.

It is certainly horrible when our financial information or accounts become compromised by hackers or other groups. So it is hard to imagine the impact of having your health and fitness data fall in the wrong hands. In most cases, it might be harmless, but in some cases it might lead to some people being taken advantage of.

READING: [I downloaded 14 years of my Facebook data and here's what happened](#)  
by Sara Ashley O'Brien

# Sharing of information

Doximity “[is an online networking service for medical professionals](#)”. Even this networking app has medical misinformation being shared.

READING: [The social network for doctors is full of vaccine disinformation](#) by Ari Levy



READING: [COVID-19 Misinformation Also Lurks in Doximity: Doctors Claim Even Fellow Physicians Spread Fake News](#) by Griffin Davis

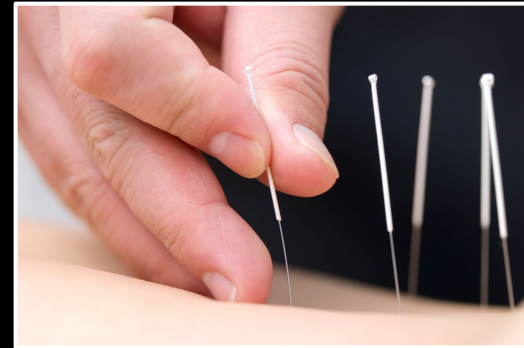
Even though, everyone using this platform is a medical professional, the information they share might not always be reliable. Same problem may be true for various services or devices that you may use for health, fitness, and nutrition. People creating the content or making the devices may not always be reliable sources. Your health and your life may depend on these, so it is important to make sure a higher quality of service is available for those that depend on them.

# Dark Side - Pseudo Therapies

The treatment of mental health disorders, or physical wounds should be taken with great care. Even then, non-evidence based treatments are often used and recommended. These can include: homeopathy, herbal medicine, chiropractic, acupuncture, energy healing, and others.

Some of these therapies can cause serious direct harm. One prominent example is the death of a 10 year-old girl, Candace Newmaker during a 70-minute session of Rebirthing Therapy. She was wrapped head to toe and surrounded by pillows in an attempt to treat reactive attachment disorder.

READING: [Rebirthing therapy banned after girl died in 70 minute struggle](#) by Deborah Josefson

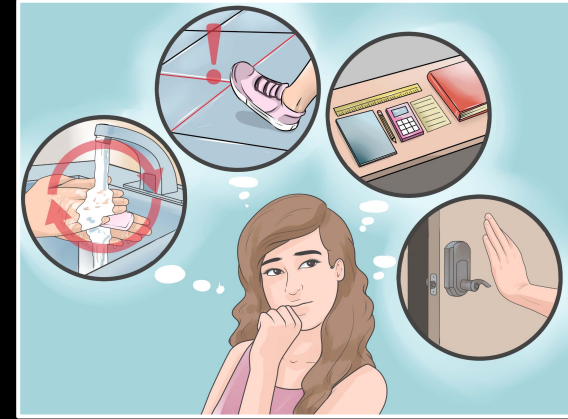


## Dark Side - Pseudo Therapies (Cont.)

Other common examples include the use of “natural remedies” or over-the-counter supplements for the treatment of Obsessive-compulsive-disorder (OCD). However, based on evidence, the first-line treatment is exposure and response prevention, also known as ERP.

A lot of these treatments have anecdotal evidence. Dig deep enough on the internet, and you might even find “scientific” evidence. However, it is the quality of evidence that truly matters. Did the evidence come from a trustworthy source? Is it widely accepted in the scientific community?

At the end of the day, make careful distinctions based on systematic facts and sound reasoning. Remember, anything taken to the extreme can be dangerous!



# Dark Side - Counterfeit Medicine

DEFINITION: A [counterfeit medication](#) or a counterfeit drug is a medication or pharmaceutical item which is produced and sold with the intent to deceptively represent its origin, authenticity or effectiveness.

Can you spot the differences?



Health risks posed by counterfeit medicine can be fatal. They include: poisoning, untreated disease, early death, and treatment failure.

The World Health Organisation estimates that up to 1% of medicines available in the developed world are likely to be counterfeit. This many not seem like a lot, but the number is closer to 10% globally, and around 50% in some developing countries.

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# Dark Side - Why does it exist?



The counterfeit drug industry has grown immensely over the years because of the potential for huge profits.

These drugs usually prevail in countries where it is easy for criminal gangs and cartels to infiltrate the market due to a high demand, along with poor surveillance, quality control, and regulations. However, no country is unaffected by fake medicines.

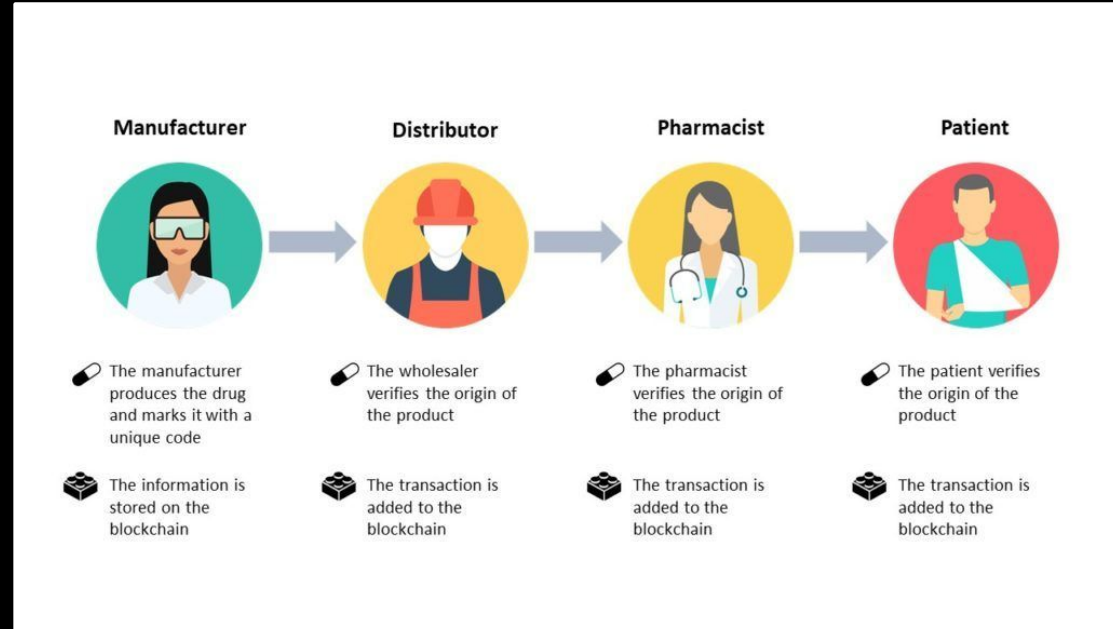
What was once considered a danger limited to low- and middle-income countries has become a global issue.

Most drugs nowadays are offered via scam emails or distributed via illegal internet vendors. It is easy for manufacturers to exploit these online pharmacies since consumers have no way of distinguishing between fake and authentic drugs.

# Dark Side - Why does it exist? (Cont.)

Blockchain provides a way to store data records, which are transaction logs arranged in blocks.

When applied to the pharmaceutical supply chain, blockchain offers an electronic ledger where everyone in the network can see and validate transaction information.



# Dark Side - Research video

Check out this IBM Research video on Using blockchain to prevent counterfeit drugs in Kenya.

[Using blockchain to prevent counterfeit drugs in Kenya](#)  
by IBM Research



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# Activity 1

**SUBJECT:** Device or app presentation for active and healthy living

**CONTEXT:** Prepare a demonstration for a health and fitness device or app. Focus on using the device or app effectively and safely. Safe usage can be about avoiding injury as well as online safety (e.g., data privacy, social media sharing, password management). Your presentation should provide a review, an evaluation along with a demonstration and a final recommendation.

**TASK:**

1. Select a subject for your presentation.
2. Identify a key function of the tool you want to demonstrate.  
Ensure that you can make a link to your health and fitness class.
3. Plan and outline your demonstration.
4. Record a video or prepare a live presentation with the necessary props and equipment.

e.g., fitness, movements,  
activities, healthy living, etc.

EXAMPLE: [How I Use the Apple Watch to Stay Active:  
Workout with Me \[Apple Watch Series 5\]](#) by Rachel Lin

# Module Conclusion

As you can see, this module is an exploration of the newest technologies in health and fitness. In some ways we are lucky to have all of these tools and knowledge available to us through the Internet. Although, like we've seen this brings along other challenges in our lives.

Hopefully, this module will encourage you to continue exploring new solutions to live your best active and healthy life. All while being conscious and cautious about being safe online with your data.

