Web Detective

Gr. 5-7 Activity Write Up

Web Detective

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About Actua

Actua is Canada's leading science, technology, engineering and mathematics (STEM) youth outreach network, representing a growing network of over 40 universities and colleges across the country. Each year 350,000 young Canadians in over 500 communities nationwide are inspired through hands-on educational workshops, camps and community outreach initiatives. Actua focuses on the engagement of underrepresented youth through specialized programs for Indigenous youth, girls and young women, at-risk youth and youth living in Northern and remote communities. For more information, please visit us online at www.actua.ca and on social media: Twitter, Facebook, Instagram and YouTube!

Web Detective

Activity Summary

Information is constantly available online. In this activity, participants will learn the steps necessary to determine fact from fake information (e.g., misinformation, disinformation, fake news), to better analyze bias and misinformation online. They will leave this activity with the tools and strategies needed to find reliable, credible sources while avoiding fake information in any setting.

This activity is part of a series in the cyber smart education suite which includes; Digital Citizenship and You, Being Online, Web Detective, Netiquette, Crack the Code and Secure the Network. Explore [Actua's Cyber Smart Educator Handbook](#) to learn how you can bring cyber smart education into your teaching context.

Developed by Actua, 2022.

Delivery Environment	Activity Duration	Intended Audience	Tech
In-Person	1 hour	Grades 5-7 *(Ages 10-13)*	Certain activities will require a laptop/tablet. With modifications, it is possible to run this entire lesson in pairs/groups. **Facilitators should have access to a laptop, projector, speakers, and a screen or blank wall to project onto.** - Projector - Speaker - Screen/Blank Wall - Laptops/Tablets

Learning Outcomes

Following this activity, participants will:

- Identify and use credible and reliable sources and information online and offline (by using questions they should ask themselves when exploring content online and before sharing with others to reduce the spread of bias and misinformation).
- Understand how misinformation is created (including Deepfakes and fake news), as well as why it is often widely shared online.

TOOLSETS	SKILLSETS	MINDSETS
Knowledge, resources, and experiences • Misinformation • Reliable and credible sources • Machine learning	**Digital skills, STEM skills, & essential employability and life skills** • Critical thinking • Analysis • Digital literacy • Being safe & responsible online • Communicating online	**Digital intelligence, community action, and computational thinking** • Understanding your relation to technology • Ethical AI • Privacy management

Logistics (Timing, Group Sizing, Materials)

Section Title	Est. Time	Group Size	Materials
Opening Hook	10 minutes	*Whole Group*	**Facilitators** • ▶ Snowboarder Girl Chased...
Section 1: Deepfakes	20 minutes	*Whole Group*	**Facilitators** • ▶ Tom cruise magic #tomc... • ▶ Deepfakes: Can You Spot ... • Board & Board Markers

Section Title	Est. Time	Group Size	Materials
Section 2: Inspect the Media	20 minutes	*Whole Group; Small Groups*	**Facilitators** • Data Never Sleeps Graphic (Appendix C) • [Web Detective Jeopardy Slide Deck](#) • ▶ SPOT Fake News Online • [Spot Fake News](#) **Per Participant** • [Media Smarts Reality Check](#)
Reflection & Debrief	10 minutes	*Whole Group*	• N/A

Safety Considerations

Safety considerations have been provided below to support safety during this activity, however they are not necessarily comprehensive. It is important that you review the activity and your delivery environment to determine any additional safety considerations that you should be implementing for the delivery of these activities.

Emotional Safety

The goal of this Cyber Smart project is to equip participants with the tools and knowledge to understand online behaviours and make safe decisions.

- Facilitators should understand that participants have different lived experiences and prior knowledge about cyber safety, cyber security and digital citizenship. This activity may involve or lead to discussions of sensitive topics, such as cyberbullying and other online risks. Facilitators should always keep the participants' emotional safety in mind in these discussions, and defer to training from their institution and training received for this project.
- Facilitators should focus on guiding discussions toward an appreciation for healthy and safe online behaviours, and empowering participants to make responsible, informed, and smart choices.

Online Safety

Some components of this activity require the use of devices connected to the internet.

- Facilitators should review the provided videos and read/explore provided websites and materials to determine if they are suitable for their participants.
- Where applicable, facilitators should remind participants to stay on task and only use the links provided within this activity.
- Facilitators should also model and encourage appropriate online behaviour by all participants in the group (e.g., using chat boxes to answer and ask questions, using positive and encouraging language, using devices for the purpose of the task).

Curriculum Links

Each of these activities align with these components found in the [Pan-Canadian K-12 Computer Science Education Framework](#):

Cyber Security

- Starting learners should be able to define cybersecurity and create safe passwords using effective criteria. Proficient learners should be able to describe common cyber attacks and identify malicious content, apply prevention practices and assess the role that people play in creating, preventing, and minimizing the impacts of cyberattacks as well as consider how they affect people and society (p. 24).

Data: Data Governance

- Starting learners should be able to identify ways that their digital or physical activity creates digital data and learn how to adjust privacy settings on commonly used digital tools. Proficient learners should be able to discover who owns the digital data they produce, as well as assess provincial, national and Indigenous data governance laws/agreements and be able to advocate for their data rights and the rights of others (p. 26).

Technology and Society: Ethics, Safety & the Law

- Starting learners should be able to identify strategies to protect their personal data and identity online. Proficient learners should be able to define and apply basic copywriter principles, explain privacy concerns, and assess the effects of computer crime/hacking on self and society (p. 28).

Activity Procedure

To Do in Advance

Section Title	Preparation
General	**Think ahead and be ready to adapt:** - Determine your **delivery method** and leverage ideas from the delivery recommendations and adaptations sections. - While **estimated times** are provided, it will be helpful to think about how much time you would like to spend on different activities and discussions. - While **group sizes** (individual, pairs, groups) are suggested, many activities are flexible for whatever will work in your classroom. **Prepare for the content:** - Have **answers in mind** to share with participants for the various reflection questions asked. - Examine the provided videos and read/explore the provided materials in *Appendix C* to determine if they are **suitable** for your participants. **Equipment:** - Ensure device, screen and projector are set up. - Prepare participant devices.
Section 2: Inspect the Media	- Familiarize yourself with Spot Fake News (website). - Familiarize yourself with Media Smart's Reality Check.

Opening Hook

1. Play this video and determine whether participants think it is real or fake

   ▶ Snowboarder Girl Chased By Bear - I Was Singing Rihanna Work And D...

   (Kelly Murphy, 1.17s) - "What made you think it's real? What made you think it's fake?"

2. Tell participants the answer: Fake! This video went viral on Youtube after being shared - but it was debunked by National Geographic (among other sources).

   a. National Geographic found issues about the species of bear itself - the one shown is a Grizzly bear, which is found in North America. According to their story, the snowboarder is skiing in Japan, where these specific bears do not live. In addition, while there may be bears in the area, this type of colored bear would be far from that ski specific location.

      i. While this story is fake, bears have actually chased skiers in the past (e.g., Matt Mostellar).

Section 1: Deepfakes

1. **"Have you ever interacted with something fake (or something that seems fake) when you go online (e.g., a picture, video, person)? How can you decide if something you see online is real or not?"**

   a. _Additional prompts:_ Something too good to be true? Something extremely urgent? News that doesn't seem real?

   b. _Possible responses: check if the person who shared it is someone who is credible (e.g., a scientist who has conducted a lot of research in the field), find out if there is other information about it, do more research on the topic, etc._

2. **Computer Science Connection: "Are you familiar with Deepfakes?"** - Ask if someone can provide a definition. Deepfakes are convincing falsified videos, audio recordings and photos that have the likeness of someone who is not actually present in that video or photo.

3. Play the following video as an example of Deepfakes:

   ▶ Tom cruise magic #tomcruise #tiktok #viral (all in one channel, 0:20s)

4. Create a Venn Diagram on the board to compare the "issues vs. benefits" of Deepfakes.

   a. **"What are some issues that might come from using Deepfakes?"**

i. _Possible responses_: pretending to be someone else, ruining someone's reputation, tricking people, spreading rumours and lies by pretending to be a celebrity or politician, inciting political unrest.

b. **"What are some benefits of this tool?"** (see _Background Information in Appendix B_ for more information).

5. Play this video for participants as an explanation of what Deepfakes are with the connection to Artificial Intelligence and Machine Learning:

   ▶ Deepfakes: Can You Spot a Phony Video? | Above the Noise (Above The Noise, 0:00-**2:28s**, ***it is important to stop the video at 2:28s in order to keep the conversation appropriate for your participants**).

Section 2: Inspect the Media

1. Ask participants **"How much information/data do you think is created on the internet every minute?"**

2. Show them _Data Never Sleeps Graphic (Appendix C)_: Is there anything they find surprising? There are 1440 minutes in a day - if time permits, participants can do some calculations to see how much data is created in a day on a platform they are familiar with (e.g., 1440 minutes x 5.7 million Google searches).

   a. With all of this data, imagine how much information is shared → these numbers grow every second! This is why it is important to be able to determine what is accurate and credible.

      i. **Computer Science Connection:** There are algorithms that exist to flag certain content but this is still a very manual task that relies on the communities and users to understand what is credible and what is not!

Domo (N.D.). _Data Never Sleeps 9.0._ Retrieved from
https://dailyinfographic.com/how-much-data-is-generated-every-minute

b. Sometimes misinformation can come from trusted sources (e.g., friends and family) who might share posts on WhatsApp or Facebook.

3. **"What kind of questions can we ask to determine whether sources or stories are reliable and trustworthy?"**

   a. *Possible responses: Does it provide any concrete evidence? Who made the material, are they seen as an expert in the field? Is the information free of grammatical, spelling and other errors? Does it acknowledge that there are other perspectives on the issue? Does it have any hidden motives (political, religious, personal, etc.)?*

4. Play this video that shares information on SPOT - 4 questions to ask when assessing online news and information: ▶ SPOT Fake News Online (News Media Canada, 1:00s). Review the 4 simple steps to SPOT fake news on Spot Fake News.

5. Put participants in small groups and play Jeopardy using the Web Detective Jeopardy Slide Deck (this can be played by first to "buzz" or just by having each group tally their scores based on their correct answers). After each question, ask each group to discuss if the video is **"Fact or Fake? Why do you think this? Was it difficult to determine?".**

6. If time permits, have participants play Media Smart's Reality Check to learn more about content online and further demonstrate their knowledge.

Reflection & Debrief

1. Discuss the following question(s) with participants to help them reflect on themselves and their online experiences (these could be shared with the entire group/in small groups/written down):

   a. **"What is the impact of spreading fake news? Why is it important to be careful of misinformation online?"**

      i. *Possible responses: people who do not know the right questions to ask will believe what is said; it is important to be careful of misinformation so that we are aware of it and find the most accurate information on a topic before forming an opinion.*

   b. **"What did you learn today that can help you with deciding what is real and what is fake?".**

2. Discuss the different careers listed in *Appendix A: Career & Mentor Connections*.

3. Encourage participants to be a Cyber Smart Ambassador and share their learnings from this activity with their friends and family.

Delivery Recommendations

How might you deliver this content in different settings? Every activity has been designed for in-person delivery. Here, we provide recommendations for remote learning (online) or unplugged (no tech).

Remote (Online)	Unplugged (Low/No Tech)
General	
- Encourage participants to unmute themselves or type in the chat based on what is easiest for them to communicate. - Leverage a tool where participants can all participate online during discussions (e.g., Mentimeter, Jamboard, etc). - Make note of any links that need to be shared and be prepared to share them in the chat. - Use polls or other group interactions to check in and keep up engagement.	Leverage boards to do brain storms/write down participant responses.
Opening Hook	
For brainstorming, consider doing a verbal discussion or use a collaborative tool (e.g., Jamboard, Google Doc, Mentimeter).	Find and print out 2 images (1 of a doctored image and 1 of the original image/ similar). Ask participants if they think it is real or fake.
Section 1: Deepfakes	
Activity can be done as-is online.	Skip this section but verbally

Remote (Online)	Unplugged (Low/No Tech)
For brainstorming, consider doing a verbal discussion or use a collaborative tool (e.g., Jamboard, Google Doc, Mentimeter).	bring up Deepfakes as an additional reason to ask critical questions when online during Section 3.
Section 2: Inspect the Media	

Remote (Online)	Unplugged (Low/No Tech)

• The Jeopardy game can be done individually rather than in groups. You can have participants choose a tile in the chat.	• Print out the infographic.
	• Focus on discussion questions.
	• Say the following statements outloud and have participants indicate if they think it is fake (for example, by raising an object, raising their hand, tapping their desk, moving to one side of the room). The reality is that they all sound fake, but are true. This is meant to further emphasize that you need to do your own research when reading things online to determine if they are true or false):
	  ○ There are more tigers in captivity in the US than in the wild worldwide.
	  ○ Pineapples take about two years to grow.
	  ○ Cheetahs can't roar. They can only meow like domestic house cats.
	  ○ Scientists who work with cockroaches often become allergic to preground coffee.
	  ○ Around the world, many militaries have trained

Remote (Online)	Unplugged (Low/No Tech)
	combat dolphins to perform dangerous tasks, like locate underwater mines. ○ More time separates Tyrannosaurus rex from Stegosaurus than T. rex from humans today. ○ Nintendo was founded in 1889. ○ Bananas are berries, but strawberries are not. ○ Sharks predate trees. ○ Cleopatra lived closer to the release of the first iPhone than she did to the building of the pyramids of Giza. ● Print out select doctored images from Bored Panda and a selection of real, unedited images. Have participants determine which they think are real, and which are fake. Have them explain their thinking.
Reflection & Debrief	
● Activity can be done as-is online. For brainstorming, consider doing a verbal discussion or use a collaborative tool (e.g., Jamboard, Google Doc, Mentimeter).	● Activity can be done as-is unplugged.

Delivery Adaptations

How might you adapt the time, space, materials, group sizes, or instructions to make this activity more approachable or more challenging? **Modifications** are ways to make the activity more accessible, **extensions** are ways to make the activity last longer or more challenging.

Modifications

GENERAL

- Ensure captions are on during videos played.
- Provide computer mouses where laptops are in use.
- Use pairs/groups instead of having participants work individually.

Extensions

SECTION 1: DEEPFAKES

- Play this video for an in depth explanation of AI's role:
  ▶ Deepfake Videos Are Getting Terrifyingly Real (NOVA PBS Official, 3:35s)
- Participants can create their own "Deepfakes" where they change the original story of a piece of media (an image, a newspaper report, etc.)
  - Create their own newspaper using a newspaper generator (e.g., [Funny Newspaper Generator](#))
  - Edit photos using a digital photo editor (e.g., Adobe Photoshop)
    - Ideas include making the image look "older" by editing it to be black and white; cropping images to remove key figures, etc.

SECTION 2: INSPECT THE MEDIA

- Introduce "opinions"
  - Introduce the conversation on opinion: "What is the difference between fact and opinion?"
    - Possible response: A fact is something that can be proven or disproven by doing research, while an opinion is something based on personal beliefs or feelings - it cannot be proven.

- - - Different people hold different opinions based on their lived experiences and perspectives. It is important to be respectful of different opinions, even if they do not match your own.
    - Read the following fact and opinion outloud and ask participants to decide if they think the statement is a fact or an opinion (tell them the answers after they guess):
      - There are less women in STEM than men (fact).
      - Python is the greatest programming language to exist (opinion).
        - Let participants know that opinions should always be encouraged and at the same time should be respectful of all identities. That is how we grow and learn. Research often originates from people's opinions.
      - Depending on the time, ask participants to also think of one fact and one opinion about the topic of STEM.

REFLECTION & DEBRIEF

- Participants can create a [Canva Poster](#) to share strategies with their friends and families on what cyber smart steps we can take when interacting with new users online. Share this link with them https://www.canva.com/posters/templates/campaign/. It will be helpful to explore Canva to get an idea of how to use this resource yourself.
  - Quickly show them how to create a new project and the different editing features they can use. If helpful, choose a suitable Canva template rather than have them find one themselves/have them draw it out.
  - Participants can draw their creations on paper rather than on Canva.
  - If time permits, have participants share their work.

References & Gratitude

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Appendices

Appendix A: Career & Mentor Connections

ROYAL CANADIAN MOUNTED POLICE: CYBERCRIME INTELLIGENCE ANALYST

- A cybercrime intelligence analyst specializes in cybercrime, and uses that knowledge to develop strategies to identify criminal trends and patterns. They use this information to design strategic intelligence products, and provide expert advice on complex criminal investigations.

CYBER SECURITY PROFESSIONAL (INFORMATION SECURITY PROFESSIONAL)

- A cyber security professional identifies threats and vulnerabilities in various systems and softwares. They apply their knowledge to design security measures and implement solutions to defend against cybercrime, such as hacking and malware. These measures come in the form of technology and organizational processes.

CYBER SECURITY ANALYST (INFORMATION SECURITY ANALYST)

- A cyber security analyst monitors a company's computer networks and systems. In order to further protect the company from threats and breaches, they plan and implement security measures.

SECURITY SOFTWARE DEVELOPER

- A security software developer designs and integrates security software tools, develops systems, and tests vulnerabilities in their designs.

RESEARCHER

- A researcher can specialize in different areas of study, such as Science, Computer Science and Math. They conduct their own research, collect and analyze data in order to solve problems or explore issues. Researchers also review relevant, credible, and reliable sources related to their own research.

CONTENT DEVELOPER

- A content developer researches, curates, edits, and develops content for different organizations depending on the project they are assigned to. They must ensure that the sources they are reviewing are reliable and credible.

FACT CHECKER

- A fact checker looks into facts and information to verify and improve the quality of information in the media or published materials.

Appendix B: Background Information

MISINFORMATION AND DISINFORMATION

Misinformation is "false information spread, regardless of intent to mislead" (Dictionary.com, n.d.). This could involve:

- Sharing details that you misheard or misremembered.
- Unknowingly telling family you heard something on TV that isn't true.
- Unknowingly sharing a post on social media that has incorrect information.

Disinformation is "deliberately misleading or biased information" (Dictionary.com, n.d.).
This could be:

- Manipulated narrative or facts
- Propaganda

Fake News "is false or misleading information presented as news". This is often created to be widely shared or distributed for the purpose of generating revenue, or promoting or discrediting a public figure, political movement, company, etc. (Dictionary.com, n.d.). This could involve:

- False news stories
- Altered videos
- Manipulated pictures

The Walden University Library describes the negative impacts of Fake News ([Walden University Library](#), n.d.):

- Frustrating and a waste of time: Users deserve accurate information, so finding biased and false information is frustrating and time consuming.
- Dangerous: the spread of lies and deceit can create hostility.
- Sharing/supporting fake news can damage your reputation and diminish your credibility.
- Creates general mistrust in all news and media sources.

DEEPFAKES

According to [Think Automation](#), Deepfakes are convincing falsified videos, audio recordings and photos that have the likeness of someone who is not actually present in that video or photo. Deepfakes are powered by artificial intelligence (AI). AI is the development of computer systems to perform tasks that would usually need human intelligence (learning from data to be able to classify, make predictions and generate new data). They can replicate voices and change videos. The term is a combination of the words "deep learning" (from AI) and "fake".

There are a lot of alarming concerns and questions surrounding ethics that arise with the use of Deepfakes because they can potentially spread bias and misinformation (undermining our trust). They also offer opportunities for mischief and malicious use.

However, there are benefits to using this tool. This technology holds positive potential for:

- **Education** in the sense that it could preserve stories and revolutionize lessons with interactivity (e.g., Deepfakes with historical figures or holograms in museums).
- It also has a role in **reducing language barriers** in order to reach worldwide audiences (e.g., David Beckham's malaria announcement was shared in 9 different languages).
- In terms of the **entertainment industry**, Deepfakes can be used if an actor has passed away in order to recreate the likeness of that individual.
- In **medicine**, it can help with the development of new diagnoses and monitoring through creating deepfake patients for testing and experimentation.
- The shock-value of deepfake videos often results in a viral phenomenon. These videos can be used to deliver a **strong message**.

STRATEGIES TO USE WHEN READING INFORMATION ONLINE

According to a media literacy tool developed by News Media Canada, there are 4 simple questions that users should ask themselves before consuming information that they found online. [Business Wire](#) (2019) lists the 4 questions created by Fake News Online (SPOT) with additional details:

- "**S**: Is this a credible **S**ource? Check the source of the article - and be skeptical.
- **P**: Is the **P**erspective biased? Think critically and look for varying viewpoints on an issue.
- **O**: Are **O**ther sources reporting the same story? Be your own fact-checker and verify the validity of the story.
- **T**: Is the story **T**imely? Check the date the story was published - sometimes, stories use old information to take advantage of a timely occurrence."

Appendix C: Additional Resources

OPENING HOOK

Video(s)

- ▶ Snowboarder Girl Chased By Bear - I Was Singing Rihanna Work And D… (Kelly Murphy, 1:17s)

SECTION 1: DEEPFAKES

Video(s)

- ▶ Tom cruise magic #tomcruise #tiktok #viral (all in one channel, 0:20s)
- ▶ Deepfakes: Can You Spot a Phony Video? | Above the Noise (Above The Noise, 0:00-**2:28s**, ***it is important to stop the video at 2:28s in order to keep the conversation appropriate for your participants**).

SECTION 2: INSPECT THE MEDIA

Activity Slide Deck(s)
- [Web Detective Jeopardy Slide Deck](#)

Infographic(s)
- Data Never Sleeps Graphic *(see below)*

Website(s)
- [Spot Fake News](#)
- [Media Smarts Reality Check](#)

Video(s)
- ▶ SPOT Fake News Online (News Media Canada, 1:00s)

Data Never Sleeps 9.0

How much data is generated *every minute?*

The 2020 pandemic upended everything, from how we engage with each other to how we engage with brands and the digital world. At the same time, it transformed how we eat, how we work and how we entertain ourselves. Data never sleeps and it shows no signs of slowing down. In our 9th edition of the "Data Never Sleeps" infographic, we bring you a glimpse of how much data is created every digital minute in our increasingly data-driven world.

TWITTER USERS POSTS **575k** TWEETS

TIKTOK USERS WATCH **167M** VIDEOS

GOOGLE CONDUCTS **5.7M** SEARCHES

DISCORD USERS SEND **668k** MESSAGES

12M PEOPLE SEND AN **IMESSAGE**

INSTAGRAM USERS SHARE **65k** PHOTOS

CLUBHOUSE CREATES **208** ROOMS

FACEBOOK USERS SHARE **240k** PHOTOS

SNAPCHAT USERS SEND **2M** SNAPCHATS

FACEBOOK LIVE RECEIVES **44M** VIEWS

AMAZON CUSTOMERS SPEND **$283k**

YOUTUBE USERS STREAM **694k** HOURS

6M PEOPLE SHOP **ONLINE**

NETFLIX USERS STREAM **452k** HOURS

STRAVA ATHLETES SHARE **1.5k** ACTIVITIES

TEAMS CONNECTS **100k** USERS

ZOOM HOSTS **856** MINUTES OF WEBINARS

SLACK USERS SEND **148k** MESSAGES

VENMO USERS SEND **$304k**

INSTACART USERS SPEND **$67k**

EVERY 1 MINUTE OF THE DAY

PRESENTED BY DOMO

As of July 2021, the internet reaches 65% of the world's population and now represents 5.17 billion people—a 10% increase from January 2021. Of this total, 92.6 percent accessed the internet via mobile devices. According to Statista, the total amount of data consumed globally in 2021 was 79 zettabytes, an annual number projected to grow to over 180 zettabytes by 2025.

As the world changes, businesses need to change too—and that requires data. Domo gives you the power to make data-driven decisions at any moment, on any device, so that you can make smart choices in a rapidly changing world. Every click, swipe, share, or like tells you something about your customers and what they want, and Domo is here to help you and your business make sense of all of it.

Global Internet Population Growth
(IN BILLIONS)

2016	2018	2020	2021
3.4	4.3	4.5	5.2

Learn more at domo.com