Media Literacy champions

Teacher Handbook

bellingcat DEMOS PSHE Association

Funded by
European MEDIA AND INFORMATION Fund
Managed by Calouste Gulbenkian Foundation

The Student View

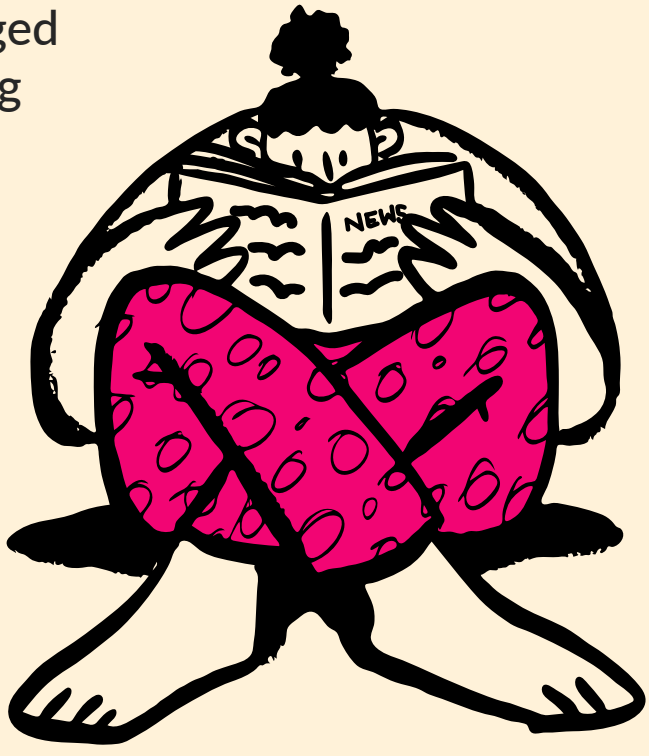
Contents

Introduction

The Student View wants every young person to have access to media literacy education and insights into careers in journalism.

To help achieve this goal, we've put together a three-part offer: a training program for teachers, a Pop-Up Newsroom initiative, and four PSHE (Personal, Social, Health, and Economic) Education lessons that you can use in your classrooms. While your students will get the most out of these materials via full engagement with these three parts, they're designed to be standalone.

In this pack we have created a number of classroom resources as well as guidance for you to set up your own Pop-Up Newsrooms in your school to help raise awareness about media literacy and give young people media literacy skills. Our Media Literacy Champions resource is specifically designed for teachers working with students aged 11 to 16, offering them an amazing opportunity to create their very own news reports.



What is Storytelling?

Storytelling is one of the most powerful ways we can communicate with each other. It is how we explain the world, make sense of the world, and how we pass on important information. Stories incorporate various ideas, beliefs, and insights, and we can use different methods to convey this, such as through words, film, and photo.

What is Media Literacy?

Media literacy is the ability to evaluate the editorial approaches of platforms and publishers, as well as understand, critique, question, and create media in a variety of forms, for a range of audiences.

Media literacy includes the ability to:

- use information and communication technologies
- understand digital communication tools
- create media thoughtfully and conscientiously
- help us understand the world around us and make informed decisions
- evaluate the credibility of news stories and identify what disinformation, misinformation, and malinformation are.

What is Digital Citizenship?

Digital citizenship is the ability to play a full and active role in our democracy and affect change within society. Digital citizens are responsible for the use of technology to learn, create, and participate online while treating others with dignity and respect.

The ability to participate as a full and equal digital citizen requires:

- literacy and competency in digital technologies
- access to digital technologies
- the use of digital technologies in ways which respect the rights of others
- supporting the community through digital technologies.

Glossary of Terms

Term / Acronym	Definition
Adverts	Adverts, short for advertisements, are promotional messages or visual/audio content designed to promote a product, service, or idea, disseminated through various media channels to reach and engage potential consumers.
AI	AI (Artificial Intelligence) is a branch of computer science that focuses on creating intelligent machines capable of performing tasks that typically require human intelligence, such as problem-solving, learning, and decision-making.
Algorithm	An algorithm is a fixed series of steps that a computer performs in order to solve a problem or complete a task.
Audience	A group of people who receive or consume a specific message or content, with common characteristics, interests, or demographics.
Bias	Bias refers to a prejudice or tendency that influences a person's judgement or decision-making, often leading to unfair or unbalanced treatment or favouring one perspective over others.
Brand/Branding	A brand is a unique identity and perception of a company, product, or service in the minds of consumers, comprising values, qualities, and associations that distinguish it from competitors.
Broadcast	A broadcast is the transmission of audio or video content to a wide audience through radio, television, or the internet, allowing simultaneous access to the same information or entertainment.
Byline	A byline is a line of text that identifies the author of a written article, news story, or piece of content, typically displayed at the beginning or end of the work.

Censorship	Censorship is the deliberate control, suppression, or restriction of information, ideas, or artistic expression by governments, organisations, or individuals to prevent certain content from reaching the public.
Consumer	A consumer is an individual or entity that purchases goods or services for personal use or consumption, contributing to the demand and economic activities within a market.
CPD	Continuing Professional Development refers to any activity, formal or informal, that helps you develop your skills and knowledge, and enhances your professional practice.
Critical Thinking	Critical thinking is the ability to make clear, reasoned judgements based on interpreting, understanding, applying, and synthesising evidence.
Data	Data refers to raw facts, statistics, or information collected through observations, measurements, or surveys. It can be structured or unstructured and serves as a foundation for analysis and decision-making in various fields.
Demographic	Demographic refers to specific characteristics or attributes of a population, such as age, gender, income, education, ethnicity, and location, used for market research and understanding social trends.
Devolved	Devolution is the decentralisation of governmental power. Examples of devolution are the powers granted to the Scottish Parliament, the National Assembly for Wales, the Northern Ireland Assembly, and to the Greater London and Local Authorities.
Digital	Digital refers to information or data represented in binary code (0s and 1s) and processed by electronic devices. It encompasses technologies and content accessible through computers, the internet, or digital devices.
Digital Literacy	Digital literacy is the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.
Digital Media	Digital media is an umbrella term for all types of electronic data (text, databases, images, audio, and video).

Disinformation	Disinformation is false information that is deliberately created or disseminated with the express purpose to cause harm. Producers of disinformation typically have political, financial, psychological, or social motivations.
E-safety, Online Safety, or Internet Safety	E-safety, online safety, or internet safety is an awareness of the nature of the possible threats that you could encounter while engaging in activity through the Internet.
Echo Chamber	An echo chamber is a social environment where individuals are exposed only to information or ideas that reinforce their existing beliefs, leading to a reinforcement and amplification of those views without critical challenge.
Emotive Content	Emotive content elicits strong emotions in the audience, evoking feelings like joy, sadness, anger, or excitement through compelling storytelling, visuals, or language.
Evidence	Evidence comprises factual information, data, or supporting materials that validate claims or assertions, serving as a basis for drawing conclusions and reinforcing the credibility of an argument or investigation.
Fact	A fact is a statement or information that is objectively true, supported by evidence, and verifiable, making it an accurate representation of reality and not influenced by personal opinions or beliefs.
Fact-Checking	Fact-checking (in the context of information disorder) is the process of determining the truthfulness and accuracy of official, published information, such as politicians' statements and news reports.
Fiction	Fiction is a form of storytelling that presents imagined or invented narratives, characters, and events which may not be based on real-life occurrences but which provide entertainment, escapism, and creative expression.
Filter	A filter is a tool or mechanism that selectively screens, sorts, or separates specific elements, data, or content from a larger set based on predetermined criteria or parameters.
Gatekeeper	A gatekeeper is a person, organisation, or system that controls access to information, resources, or opportunities, determining what is allowed to pass through and reach a wider audience or recipient.

Genre	Genre refers to a category or classification used to group artistic works, literature, music, or films based on shared characteristics, themes, styles, or conventions, facilitating audience expectations and appreciation.
Headline	A headline is a brief and attention-grabbing title or heading that appears at the top of an article, news story, or webpage, summarising the main point or content.
Higher-Order Thinking Skills	Higher-order thinking involves the learning of complex judgmental skills such as analysis and evaluation.
Influencer	An influencer is an individual with a significant online presence and following who can shape opinions, trends, and consumer behaviour through their expertise, charisma, and persuasive content on social media platforms.
Infodemic	An infodemic is too much information, including false or misleading information, in digital and physical environments during a disease outbreak.
Information Disorder	Information disorder describes genuine information that is shared with an intent to cause harm.
Information Literacy	Information literacy is the ability to effectively find, identify, evaluate, and use information.
Interview	An interview is a formal or informal conversation between an interviewer and an interviewee, where questions are asked to gather information, opinions, or insights on a specific topic or subject.
Key Stages	A key stage is a stage of the state education system in England, Wales, Northern Ireland, and the British Overseas Territory of Gibraltar setting the educational knowledge expected of students at various ages.
Malinformation	Malinformation is genuine information that is shared to cause harm. This includes private or revealing information that is spread to harm a person or reputation.

Marketing	Marketing is the process of promoting and selling products or services to a target audience through various strategies, including advertising, market research, branding, and communication, to meet consumer needs and achieve business objectives.
Mass Media	Mass media refers to various forms of communication, such as television, radio, newspapers, magazines, and the internet, that reach a large and diverse audience simultaneously, disseminating information, news, and entertainment on a broad scale.
Media Literacy	Media literacy is the ability to evaluate the editorial approaches of social media platforms, print, broadcast, and digital outlets, as well as understand, critique, question, and create media in a variety of forms and for a range of audiences.
Medium	A medium is a channel or means of communication used to transmit information, messages, or content, such as television, radio, print, internet, or social media platforms.
Misinformation	Misinformation is information that is false, but not intended to cause harm. For example, individuals who don't know a piece of information is false may spread it on social media in an attempt to be helpful.
Monopoly	A monopoly is a market structure in which a single company or entity dominates the supply of a particular product or service, allowing it to control prices and exclude competition.
Narrative	A narrative is a storytelling technique used to convey a series of events, experiences, or ideas in a structured and coherent manner, often with characters, plot, and setting, to engage and entertain an audience.
News Publishers	A news publisher is a person or organisation that publishes a newspaper, magazine, or website containing news, information, and opinion on current affairs.
Newsworthy	Newsworthy refers to information or events that have sufficient importance, relevance, or public interest to be considered newsworthy and deserving of coverage by media outlets.

Non-Statutory	Non-statutory means being established by a Government Minister, but otherwise than under an Act of Parliament.
Ofcom	Ofcom is the regulator and competition authority for the UK's communications industries. It regulates the TV and radio sectors, fixed line telecoms, mobiles, postal services, plus the airwaves over which wireless devices operate.
Online Harms	Online harms are user-generated content or behaviour that is illegal or could cause significant physical or psychological harm to a person.
Opinion	An opinion is a personal viewpoint or belief about a particular subject or issue, often based on individual thoughts, feelings, values, and experiences rather than objective facts or evidence.
Production	Media production involves the creation and development of various forms of content, such as films, TV shows, videos, music, and digital media, through planning, shooting, editing, and post-production processes.
Product Placement	Product placement is a marketing strategy where specific products or brands are subtly integrated into movies, TV shows, or other forms of media content to promote them to the audience without overt advertising.
Propaganda	Propaganda is a form of communication, often biased or misleading, used to influence and manipulate public opinion or behaviour in favour of a particular ideology, cause, or political agenda.
PSHE	Personal, Social, Health, and Economic (PSHE) Education provides a statutory curriculum that focuses on strengthening the knowledge, skills, and connections that are essential to keep children and young people healthy and safe and prepare them for life and work.
Representation	Representation refers to the portrayal, depiction, or presentation of individuals, groups, ideas, or concepts in media, art, literature, or other forms of communication, influencing how they are perceived by others.
Safeguarding	Safeguarding is the action that is taken to promote the welfare of children and protect them from harm.

Software	Software is a set of instructions or programs that enable computers or electronic devices to perform specific tasks, manage data, and execute various operations, allowing users to interact with the hardware effectively.
Source	A source is a provider of information, data, or evidence used to support claims, arguments, or research, ensuring credibility and reliability of the information presented in various contexts such as journalism, academia, and investigations.
Stereotypes	Stereotypes are simplified and often exaggerated beliefs, assumptions, or generalisations about a group of people based on their perceived characteristics, leading to potential biases and misconceptions.
Targeted	Targeted refers to a focused approach aimed at a specific audience, group, or demographic. This involves tailoring content, advertising, or marketing efforts to meet their needs and preferences for increased relevance and effectiveness.
Technology	Technology refers to the application of scientific knowledge, tools, and techniques to create, modify, or enhance processes, products, or services, improving efficiency, productivity, and the overall human experience.
Train-the-Trainer	Train-the-Trainer is a learning technique where a course is delivered by an Expert Trainer to other trainers, who then go on to facilitate learning in an in-person or virtual classroom.
Virtual	Virtual refers to an artificial or computer-generated environment or experience that simulates the real world, allowing users to interact with digital representations or elements through sensory inputs like sight and sound.

Handbook on Media Literacy Training Module

This handbook is intended to be your guide as you work through the six modules in this media literacy teacher training.

It contains information that will aid your delivery of any of the four PSHE sessions on this topic, including suggestions for activities, conversation starters, and more.

The six sessions covered in this handbook are:

1. Spotlight on the Power of Media Literacy

2. Spotlight on Navigating Mis-Disinformation

3. Spotlight on Getting Your Facts Straight

4. Spotlight on Facts, Opinions, and Bias

5. Spotlight on Algorithms, Cookies, and Your Feed

6. Spotlight on Deepfake Images and AI

The rest of this handbook will focus on each one of the sessions listed above. Each session contains an outline, learning objectives, and learning outcomes.

The outline categories will be used to structure the handbook. It is here that you will find the bulk of the information contained in this document. Each outline subheading will contain context and resources to supplement the corresponding section in the sessions.

Introducing the Skills Builder Partnership

The Skills Builder Partnership supports educators, organisations, employers and learners of all ages to develop eight *Essential Skills.*

We have worked with Skills Builder to ensure all of our classroom resources not only develop Media Literacy skills, but also their essential skills of **Listening, Speaking, Problem-solving** and **Staying Positive.**

You will see prompts throughout the resources to show where the different skills are being developed.

You can find out more about Skillsbuilder and their Essential Skills at skillsbuilder.org.

1. Spotlight on the Power of Media Literacy

This first session lays the foundation for the rest of the module by introducing its key concept, media literacy, which can be defined as the wide range of critical skills needed to successfully access, analyse, and create media. Without media literacy, we are prone to fall victim to some of the worst aspects of our online world: political disinformation, hateful conspiracy theories, harmful marketing, and more.

As you work through this session, it will be important to keep in mind that the subsequent sessions all build from this one. Therefore, sessions 2-6 are all intended to answer the question, "What is media literacy, and why is it important?"

To this end, the learning objectives of this session are:

1. To understand the role media literacy plays in how we consume the news.
2. To develop students' understanding of the range of news media available, and that the reliability of news can vary.

The learning outcomes of this session are:

1. Students can identify different types of media and how they structure their stories.
2. Students can explain the power of the media and why media literacy is important.
3. Students can explain the importance of establishing the reliability of a news story.

This session is divided into the following categories:

1. What is media literacy?
2. What are the different types of news media?
3. What does it mean to think of media as a business?

We will turn to each of the three sections above in the remainder of this session.

Media Literacy

Media Literacy Now, a US-based grassroots organisation that works to educate the public on this topic, defines media literacy as the range of skills needed to analyse, assess, and create media "thoughtfully and conscientiously". The definition is broad because it needs to be; media is so pervasive in our lives both as consumers and as creators that it escapes narrow definitions.

Media literacy is as important to our engagement with society as literacy. What can set the two apart is both the context and the technologies associated with each. Whereas literacy was, up until the end of the 20th century, almost exclusively associated with print, media literacy today is associated with the all-encompassing digital world in which we are caught up.

Think of all of the ways in which your students engage with digital media on a daily basis. Depending on their age and the rules that they have at home and at school, they are likely to be spending more time online than any generation prior. And, even if their access to digital spaces is limited, those restrictions will disappear by the time that they're adults. Therefore, it is not an understatement to say that media literacy is more important today than it has ever been.

This importance has not been lost on the wide range of government actors, scholars, journalists, and others who have dedicated years to studying media literacy and advocating for its strengthening.

One such effort (referenced in Slides 9 to 11) came in 2010 from Renee Hobbs, a scholar from the Aspen Institute's Communications and Society Program. The report, titled "Digital and Media Literacy: A Plan of Action", aimed to put into action the recommendations from a commission created in 2009 to identify and lay out the challenges facing our societies when it came to engaging with media in all of its forms.

The report equated media literacy with "the promise of digital citizenship" (p. vii): that is, a state in which individuals are savvy enough about media to successfully engage with it in a responsible way to the benefit of others.

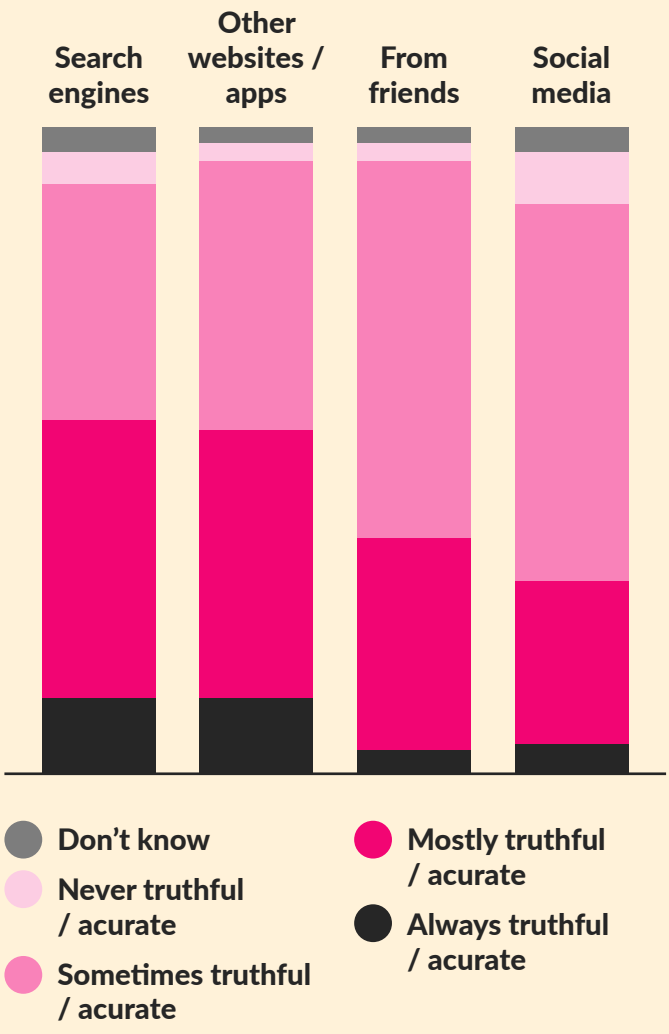
Slide 1 contains a chart outlining the key skills necessary for media literacy, according to the report.

The report is optimistic in tone. It envisions a future in which media literacy is part of mainstream education in the United States. You're helping to move the ball towards that future by engaging your students on this topic, and teaching them the necessary skills to reach "the promise of digital citizenship" (p. vii). In this sense, media literacy is about preparing your students to successfully navigate job markets, find relevant information for healthcare and other purposes, and "take social action and truly engage in actual civic activities that improve their communities" (p. viii).

What are the Different Types of News Media?

Your students are likely to come into contact with a wide variety of media, from podcasts that they listen to on their way to school, to marketing advertisements that they see on the tube, on bus stops, or - as outlined in Slides 12 to 14 - even in their favourite video games.

As outlined in Slide 16, these training materials only engage with news media. The reason for this is twofold. First, the same skills that apply to becoming news media literate apply to other types of media, like print and advertisement. Second, news media - and specifically, what has colloquially been called "fake news" - play a particularly important role in the health of our societies. Think of how often you've heard the terms "disinformation" and "misinformation" over the last few years. Chances are, the terms were also used to describe a piece of news.



Being able to discern the difference between a lie and a fact are key skills which news media literacy aims to provide.

Slides 18 to 20 introduce statistics from a 2022 Ofcom report titled "News Consumption in the UK: 2022". The report includes data on news media consumption collected from UK youth aged 12 to 15 years of age in late 2021 and early 2022.

The survey found that while the young people polled tended to trust family more than any other source, trust for digital media varied depending on the category. Note this chart, from page 80 of the report, ranking the "Perceived accuracy of news stories from each platform":

While the report does not specify what it means by each of the categories in the graphic above (i.e., "search engines", "other websites/ apps", etc.), we can make an educated guess as to which platforms fall into each category:

Search engines: this category likely refers to platforms like Google. While Google is not the only search engine (see: Bing, Yandex, and DuckDuckGo, to name just three examples), it is far and away the most popular.

Other websites/apps: this category likely includes individual websites that you may find by using a search engine, or by simply entering their address into your URL bar, such as https://www.bbc.co.uk and https://www.cnn.com.

Social media: this category likely refers to websites like TikTok, Instagram, Facebook, Twitter, and all other social media platforms.

Other questions that you may consider asking your students in this section include:

- When might someone use a search engine to look for information, versus a social media platform?
- A report by the Reuters Institute published earlier this year garnered significant media attention because it found that more young people are using TikTok to access news than traditional sources such as news websites. What might your students say when you ask them this question? How do they understand the difference between the uses of a search engine like Google versus a social media platform like TikTok? (Spoiler! We'll turn to this question in 'Spotlight on Algorithms, Cookies, and Your Feed'.)
- Are different platforms "good" for different kinds of news? For example, is TikTok better for getting entertainment news than Instagram?

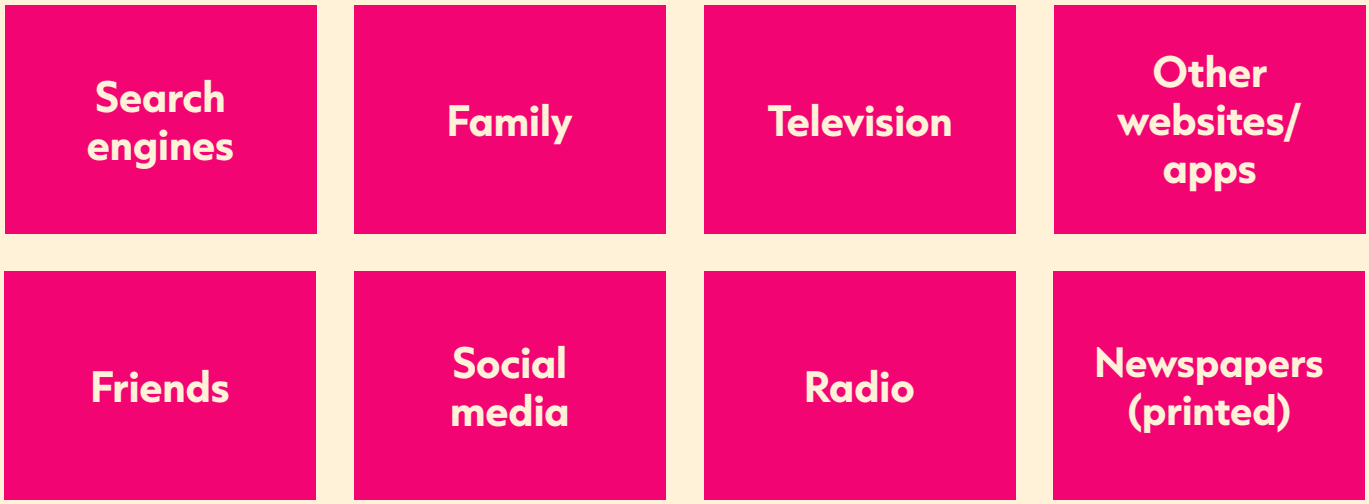
As indicated earlier, the answers in the Ofcom report suggest that students are discerning consumers of digital media. They discriminate - as they should - between media that comes from digital source X versus digital source Y. Do they have a sense for which platforms are better for getting certain types of information when compared to others? Or do they think that all platforms "serve" news content in exactly the same way?

The answers to these questions may mirror the ones suggested in Slides 22 and 23, which show how social media platforms like TikTok can be used to access news from reliable sources, such as the BBC (Slide 22) and National Geographic (Slide 23).

These discussion questions can be paired with the activity outlined in Slide 24, which you can see below:

Activity

Ask students to walk up to a board and (a) put a sticky note on what they think is accurate or not accurate (social media, search engines, from friends, etc), or (b) rank the sources in order of accuracy.



News Media as a Business

If different platforms serve news media in different ways and with varying degrees of accuracy, then what is driving that behaviour? The answer begins with thinking of news media as a business.

The concept is not an alien one; television, radio, and print media are all businesses as well. We're used to seeing and hearing commercials on these platforms. Be it a commercial for deodorant in the middle of your favourite Saturday morning cartoon, an advertisement for a travel agency on a podcast, or advertisements for makeup products in a magazine marketed to teenagers, mass media lives on advertisements. And, as with any other business, the more customers that you have looking at your product, the better.

With a few notable exceptions (namely public service broadcasters, like the BBC), news media works on the same principle. Many news websites are operated by organisations that need to generate income in order to operate. This is because they have costs associated with their operation, as does any other business. For a news organisation, this may include server costs and staff salaries. One way that news organisations generate the income needed to operate is by placing advertisements on their websites. The more people that see and click on these advertisements, the better for the news organisation.

This panorama is complicated when you consider that social media platforms that serve news content like Instagram and TikTok are businesses themselves who operate on a similar model. They, too, are interested in having as many users as possible in order to be more appealing to advertisers.

How does this affect the kinds of news that your students are likely to find online? For starters, we have to consider that in this atmosphere of competition, we are closer to being consumers than an objective, detached party. In other words, because news organisations and social media platforms compete for our attention and clicks in order to generate revenue for themselves, we must consider that they may take actions to gain an advantage over their competitors.

You may have heard of the term "clickbait" before. This refers to the practice of creating a news headline that is outrageous or intriguing with the goal of increasing the chance that we will click on it. "Clickbaity" articles may get lots of views, but they may not contain the most accurate information.

Slides 27 and 28 contain two activities, both of which are aimed at having your students consider how the information that they've just learned applies to their everyday interactions with news media.

Conclusion: Spotlight on the Power of Media Literacy

By the end of this session, you should have an understanding of what media literacy is, and why it's important to our lives and to the society in which we live.

It's important to remember that "society" is an abstract concept that refers to a large community of people, usually at the national level. This can make the idea of relating to a society a difficult task. But more concretely, societies are made up of smaller communities to which you and your students certainly relate more easily, including families, groups of friends, your school community, religious communities, and more. This means that media literacy isn't simply about developing the skills to become a successful member of an abstract concept like "our society"; it has a real-world impact on all of the groups to which your students belong.

In other words, to be media literate means to be a positive force in our communities.

2. Spotlight on Navigating Mis-Disinformation

As we'll learn in this session, misinformation and disinformation (shortened here to "mis-disinformation") pose serious challenges to civil societies across the world. The spread of false information—either deliberate or accidental—has undermined election results, circulated dangerous medical advice that's cost lives, and fuelled climate denialism. When we're media literate, we help raise our guard against this harm, and work to prevent the spread of false information.

The learning objectives of this session are:

1. To understand the impact of disinformation and misinformation in our daily lives.
2. To acquire strategies for managing different types of inaccurate media.

The learning outcomes of this session are:

1. Students can describe disinformation and misinformation.
2. Students can explain why some people share inaccurate information online, and the impact this can have.
3. Students can apply a range of strategies to check whether news is accurate.

This session is divided into the following categories:

1. What are disinformation and misinformation?
2. What are the impacts of mis-disinformation?
3. What are some strategies for managing each?

What Are Disinformation and Misinformation?

The words "misinformation" and "disinformation" have become ubiquitous in recent years. It seems like everyone is talking about them. News organisations, national governmental agencies, and international organisations have all dedicated significant amounts of human and monetary resources to researching and attempting to counter mis-disinformation. Even cartoon superheroes are tackling disinformation, as is the case with India's Priya!

Like all terms that we use and hear often, it's important to have clear definitions.

One seminal work on this topic is a 2018 report titled "Information Disorder: Toward an interdisciplinary framework for research and policy making". The report, published by the Council of Europe, laid out research led by Dr. Clare Wardle and Hossein Derekhshan which helped to lay the foundation for how we think about these terms today.

The report did this by connecting disinformation and misinformation to the concept of "information pollution on the global scale" (p. 4), facilitated in part by digital technologies and social media platforms. This, the authors argue, is a new phenomenon that can cause tremendous harm because, among other problems, it "[sows] mistrust and confusion [and sharpens] existing socio-cultural divisions using nationalistic, ethnic, racial, and religious tensions" (p. 4).

The report includes the definitions for this section's titular terms, which are paraphrased below (p. 20):

- **Disinformation:** false information that is created specifically with the intention of causing harm.
- **Misinformation:** false information that is shared accidentally; that is, not with the intention of causing harm.

As the definition above shows (and as outlined in Slide 9), in order for a piece of information to be considered disinformation, it must meet two criteria: 1) the information must be false; and 2) it must have been created on purpose to cause some harm. This harm could affect any number of parties: an individual, a group of people like an ethnic or religious group, or even the citizens of an entire country.

Slides 10 to 13 include common types of disinformation, namely:

- A TikTok account spreading false information about climate activist Greta Thunberg (Slide 10)
- A US politician known for touting conspiracy theories and anti-vaccine information, claiming that COVID-19 vaccines are not safe for pregnant women (Slide 11)
- A website from a couple criticising Bill Gates for allegedly arguing in favour of a third dose of COVID-19 vaccines (Slide 12)
- Former US President Donald Trump claiming that the 2020 presidential election was "rigged", and that "organic rallies" supporting him are "springing up all over the country" (Slide 13).

Because disinformation by definition requires that the false information be spread on purpose to create harm, it's sometimes difficult to attach the label to a specific example. How are we to know whether the people referenced in Slides 10 to 13 shared those pieces of information with the deliberate intent to cause harm?

In some cases, we can't know that for sure. But, we can often infer that intent given the existence of strong evidence to the contrary. This is perhaps best exemplified by the case of the tweet from former US President Donald Trump in Slide 13, who was most likely aware that the election had not in fact been rigged against him.

On the other hand, misinformation - as defined by the report cited above - is information that is false, but shared *without* the intent to cause harm. That is, misinformation is shared accidentally, unwittingly. While it's unlikely that you or any of your students have ever engaged in the creation of disinformation, it's almost guaranteed that you've all shared misinformation (I know I have!).

There's no shame in this; remember, misinformation is shared accidentally, just like you may accidentally spill a cup of hot tea on a friend. You may cause them some discomfort, but it wasn't your intention to do that. As with any other unintentional harm that we're liable to cause on any given day, what's important is that we take mindful steps to avoid repeating our mistakes in the future. That's what media literacy is all about!

We're more likely to share misinformation when we let our guard down. This tends to happen when our emotions are engaged: either when we're feeling extremely angry, or sad, or when we think that whatever we're seeing is funny.

Take Slides 16 and 17, for example:

- Slide 16 includes a piece of information that, at the time of the screen capture, had been "liked" by 127,000 people. The information - that a man used a flamethrower to clear snow from a driveway - is false, and it's likely that most of the people who went on to share it thought that it was a real event. Ask yourself and your students: how does that headline make you feel? The story seems outrageous in a funny way, doesn't it? This feeling lowers our guard, which makes it more likely that we'll hit the "Like" button and share the false news.
- The same principle applies to the false article in Slide 17. The news that Pope Francis would endorse Donald Trump for President of the United States may shock, upset, and even infuriate many people. Again, these feelings lower our guard, and make us more liable to share false information.

The report also defines a third term, malinformation, which it defines as "information that is based on reality" and used to cause harm. This term is referenced in passing in Slide 6. The reason for this is that it is hardly ever used by practitioners or journalists reporting on this topic; they almost always refer to misinformation and disinformation instead.

In this sense, the concept of "malinformation" may be better suited for academic discussion rather than for engagement in your classrooms, given the prominence of mis-disinformation. And, as pointed out in Slide 7, some scholars - even Dr. Wardle herself - have recently begun to debate the benefit of devoting so many resources to classifying different types of "information disorders" (p. 20), as the report calls them, as opposed to attempting to understand why people produce and share this type of false information at all.

With this debate in mind, it's still important for your students to know these terms and know what mis-disinformation is, what it looks like, and how to counter it.

Strategies for Countering Mis-Disinformation

Whenever we're confronted with a piece of information, we may have it in our heads that we could be looking at a piece of mis-disinformation. As outlined in Slide 19, it's always a good idea to keep in mind the "Five Ws" whenever we find information online.

The "Five Ws" are:

Who? Where? Why?

What? When?

We can ask these questions whenever we employ the strategies of source-checking and fact-checking, as outlined in Slide 22. Taken together, these strategies help us to counter mis-disinformation by allowing us to dissect the information presented, as well as its source. We'll learn more about fact-checking specifically in the following session, 'Spotlight on Getting Your Facts Straight'.

The names for each strategy are self-explanatory: when we source-check, we ask critical questions about the source of the information. And, when we fact-check, we ask critical questions about the information itself. The "Five Ws" can help us with this.

Any piece of information ought to be fact-checked and source-checked. For example, see the tweet by former US President Donald Trump in Slides 23 and 24:

Using the "Five Ws", we can ask questions to fact-check any of the claims in the tweet. Let's use the claim that there are many rallies happening across the country in his support. We can ask:

- Who is taking part in these supposed rallies?
- What is the actual number of rallies taking place?
- Where exactly are these rallies happening?
- When are the rallies taking place? (Or, when did they happen?)
- Why are the rallies happening now?

We could also use the "Five Ws" to source-check the information in the tweet, including, for example, "Who is Donald Trump?" and "What claims has he made in the past regarding elections?"

These are just some examples of the many questions that we could ask about this one tweet to fact-check and source-check it. The more questions we ask, the better. This is part of the reason why the "Five Ws" are so helpful here, since they help us to formulate questions.

One final strategy for countering mis-disinformation is outlined in Slides 25 to 27. We can summarise this strategy as "mindful scrolling", which means being in control of our emotions while we're online. Recall the previous section on misinformation: when our emotions are engaged, we tend to lower our guard and share misinformation. If we let our emotions take over while we navigate the internet, then we're bound to share false information.

Mindful scrolling helps us remain calm at all times, no matter what information we come across online. As outlined in Slide 27, one simple way to help ensure we're able to do this is to catch ourselves as we're starting to get emotional.

Imagine, for example, that you come across a piece of distressing news; maybe it relates to a climate event, or to a shocking breaking news story like the death of a very famous person. Chances are, you and your students have experienced plenty of situations like this (perhaps, for example, when news broke of the passing of Queen Elizabeth II). Think back to how you felt at that moment, when you first saw that tweet, or that news headline: your instinct was probably to tell someone else about it, either by sending the news to a friend on a messaging app or by sharing it on a social media platform.

When we engage in mindful scrolling, we stop at that initial moment of shock. Rather than reflexively sharing the news with others, we ought to:

1. Take a deep breath and count to ten, or put your device down and go do something else for a while. This could be going to another room in your house, or going outside for a moment.
2. Take time to source-check.
3. Take time to fact-check.

This process may take several minutes. But in the end, it may make the difference between you sharing misinformation, or not!

Conclusion: Spotlight on Navigating Mis-Disinformation

As outlined in this section, mis-disinformation is arguably among the most harmful facets of our connection to digital platforms. It can have profoundly negative impacts on our lives, from causing us to be ill to affecting the outcomes of elections.

Thankfully, there's a lot that you and your students can do to manage mis-disinformation and minimise its effects on yourselves and your communities. This session provides you with the first steps to doing that, including knowing what these concepts are, as well as being aware of mindful scrolling.

In the next session, 'Spotlight on Getting Your Facts Straight', you will learn more about how to check the accuracy of information online in order to minimise the effects of mis-disinformation even further.

3. Spotlight on Getting Your Facts Straight

In the previous session, you learned about misinformation and disinformation and its harmful impacts. At the same time, you began to acquire the skills to navigate digital spaces that are packed with mis-disinformation, namely source-checking and fact-checking. Taken together, these strategies give us the ability to engage in mindful scrolling.

This session will focus on the principles of fact-checking to strengthen the knowledge gained in the previous session.

The learning objectives of this session are:

1. To know how to use a range of strategies to fact-check information.
2. To understand what it is to be a digital citizen and be responsible in the digital world.

The learning outcomes of this session are:

1. Students can describe the benefits of getting information from open sources and the negative impact of misinformation and disinformation.
2. Students can evaluate fact from fiction from opinions in a news story.
3. Students can draw upon and apply a range of strategies to fact-check sources.

This session is divided into the following sections:

1. What is fact-checking?
2. What are open sources?
3. What are some strategies for using open sources to fact-check information?

By the end of this session, your students should be well on their way to being able to fact-check any piece of information that you come across on the internet using the wide range of open sources that are available for free. If you as a teacher are excited about this prospect, consider the Pop-Up Newsroom, which comes with its own handbook and a much deeper guide on carrying out fact-checking and digital investigations online!

What is Fact-Checking?

In the previous session, 'Spotlight on Navigating Mis-Disinformation', you learned that you can fact-check and source-check information using the "Five Ws". In Slide 6 of this session, you will be introduced to a definition of fact-checking: the process by which we determine the veracity of a piece of information. At its core, this session focuses on asking critical questions about information that is presented to us.

Slides 7 to 9 provide a concrete example of a fact-check using an article published by Bellingcat.

Slide 7 shows a screenshot of a WhatsApp message that a Bellingcat researcher received in early 2020, at the height of the first wave of the COVID-19 pandemic in Europe. The screenshot linked to a video showing a large crowd rushing into a supermarket. The person who shared the video claimed in their message that it was recorded in Haarlem, in the Netherlands.

Rather than simply sharing the video reflexively, this Bellingcat researcher engaged in "mindful scrolling": they took the time to reflect and ask critical questions about the information that was being presented to them. They did this by watching the video carefully, as outlined in Slide 8. By doing this, they noticed some details in the video that did not line up with the claim that it was taken in the Netherlands, namely the fact that some of the signs in the video appeared to be in German. With these observations in mind, this researcher was then able to look on YouTube for videos showing large crowds at Aldi supermarkets in Germany, and found an identical video that had been shared years earlier (a full breakdown of the researcher's fact-check can be found in the Bellingcat article here).

In effect, as laid out in Slide 10, what the Bellingcat researcher did in this case was use the "Five Ws" to ask critical questions about the video, and about the claim that it had been recorded in Haarlem, the Netherlands. In other words, to ask questions based on the "Five Ws" is to fact-check. As Slide 11 points out, there are lots of examples of fact-checking organisations in the UK, including Full Fact. It may be a worthwhile exercise to check out their reporting, since fact-checkers often present their processes in detail in their articles.

Slides 13 and 14 introduce Main Activity One and Handout Activity One.

What Are Open Sources?

"There's a lot of information on the internet" is a monumental understatement. Eric Schmidt, the CEO of Google, estimated in 2023 that the internet contains something like 5 billion gigabytes of data. That number is so large that it's almost an abstraction, making it difficult to fully comprehend. In short, there's a lot of information on the internet.

Much of this information makes up what we call "open sources". An online open source is any piece of information that is available on the internet. Think back to Eric Schmidt's estimate: every single Wikipedia page, BBC news article, and YouTube video; every public post on Twitter, TikTok, Instagram, or Facebook; every weather report for every city on the planet going back years; all this counts as open source information. This is because everyone with an internet connection can find this information if they know where to look.

Crucially, open sources do not include information on the internet that is locked behind a password. Your email inbox is on the internet, but it's not an open source; it's the opposite, actually, because it's protected by your password. In other words, just because something exists on the internet does not mean that it's automatically an open source. The "open" in the term is key.

Open sources have been key to all kinds of research and journalism even before the advent of the internet. One way to think about a regular brick-and-mortar library is as a repository of open source information, because anyone with the right connection (i.e., a free library card) can access it.

Given how much open source information is out there and how easy it is to access it, it truly falls on every one of us to go to these sources and fact-check claims that we come across online. That ability—to think critically about information that is presented to us, and to have the initiative and knowledge to seek out evidence by yourself—is key not just for fact-checking, but also for all aspects of your students' lives.

Using Open Sources to Fact-Check

As covered in 'Spotlight on Navigating Mis-Disinformation', one way to get the ball rolling on fact-checking and source-checking is to lay out a set of questions using the "Five Ws". This suggestion is meant to be taken literally; it's a good idea to physically write down the questions that you have and lay them out in front of you on your screen or a piece of paper.

Once you've done this, your next question should be, "Where can I find the answers to each of these questions?" In most cases, the answer is going to be Google, but that's not where the journey ends. (Note to teachers: the Pop-Up Newsroom handbook contains an in-depth guide on how to use Google effectively.)

Think back to the example in 'Spotlight on Navigating Mis-Disinformation' where we broke down a tweet by former US President Donald Trump in which he made a number of dubious claims. In that example, our list of questions was:

- Who is taking part in these supposed rallies?
- What is the actual number of rallies taking place?
- Where exactly are these rallies happening?
- When are the rallies taking place? (Or, when did they happen?)
- Why are the rallies happening now?

As mentioned above, the answer to all of these questions begins with a Google search. But that's just the first step to finding the answer, which will likely come in the form of a website.

With this in mind, it's important for you to remember that there's a lot of information on the internet. Whether the answer to a pressing fact-checking question is in the form of a BBC article, or a Facebook post, or a Wikipedia page, or a reference on The British Library website, all of it is often just one Google search away.

Slides 22 and Slide 23 contain the description of Main Activity Two and Handout Activity Two.

Conclusion: Spotlight on Getting Your Facts Straight

Unfortunately, it's very easy for people to lie on the internet. It's even easier for them to make honest mistakes when they're making claims or reporting information. The good news is that it's also easy to use open sources to fact-check information.

Knowing that there is a wealth of open source information out there is the first step to using it to your advantage. We live in an unprecedented time, where the sum of all human knowledge is available to anyone with a basic internet connection. We ought to always remember this: we have no excuse to not get our facts straight!

4. Spotlight on Facts, Opinions, and Bias

By this point, you know that the internet is packed with information. Some of this comes in the form of claims that people and organisations make about the world around them. A journalist may claim in a TikTok video that a controversy is about to unravel involving a well-known celebrity. A politician may contend in a tweet that crime is out of control in your city. A company may assert that it's doing all that it can to offset its carbon footprint in order to fight off climate change.

When we fact-check information, we are in essence determining whether the claim that we're examining is a fact or not. It may be that in the fact-checking process, we determine that this is the case. Or we may determine that the claim is actually an opinion. And, it may also be the case that in this process, we discover a bias in the way that the claim was presented by its author.

In this section, we'll break down what facts, opinions, and biases are, and how each of these can appear inside a news story that we find online.

The learning objectives of this session are:

1. To understand that news can contain the opinions of those involved in the story.
2. To understand the difference between facts, bias, and opinions, and to know that opinions must not be reported as facts.
3. To explore strategies for responsibly engaging with, sharing, and creating news stories.

The learning outcomes of this session are:

1. Students can identify the difference between fact, opinion, and bias.
2. Students can assess the reliability of a source and apply strategies for responsible news sharing.
3. Students can discuss the impacts of opinions and news mixing together

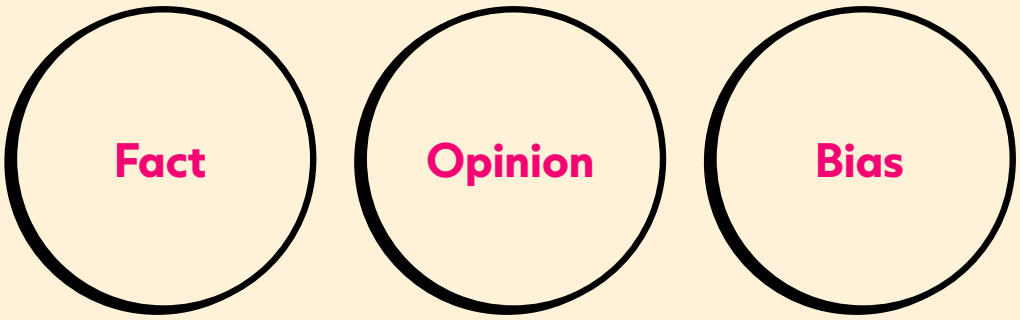
This session is divided into the following sections:

1. Defining key terms
2. What goes into a news story?
3. How might you identify the characteristics of a news story?

Defining Key Terms

It's possible that you've heard the words "facts", "bias", and "opinion" so much that you immediately know what they mean. At the same time, you may find that it's difficult to nail down a definition for each of these words if you were to ask your students at the start of the session. This may be particularly true for "bias" and "opinion". Defining these terms is therefore paramount before continuing with the session.

These three key terms are defined in Slide 6. Their definitions in the slide are elaborated below:



Something known to exist or to have happened; an objective truth.

A subjective belief, view, attitude, or appraisal.

A particular tendency, trend, inclination, or feeling, especially one that is preconceived or unreasoned.

Let's turn to each of these terms in more detail.

Facts

Here, you may find it necessary to define "objective truth", or just the word "objective". In this sense, we're using the word "objective" in the philosophical sense to refer to reality as it exists independent of our own feelings about it. For example, it is an objective truth that the Earth orbits the Sun, regardless of how I personally feel about that.

In other words, what makes a fact a fact is that it can be proven using scientific scrutiny. Facts are universal in the sense that they are all true regardless of anyone's subjective opinion.

Slide 8 contains a few examples of facts to examine with your students. What other facts can you and your students name?

Opinion

When describing opinions as subjective, you may find it useful to ask your students a question like, "What is the best food in the world?" You will probably get a wide range of answers. You can explain to your students that all of those answers are valid, because they are based on their own subjective views.

In other words, it is perfectly valid for one student to have the opinion that pizza is the best food in the world, while another's opinion is that hamburgers are the best food in the world. This is the whole point of an opinion! It is unique to the subjective views of the individual.

Another point to consider is that opinions can (and should!) change, especially when we are presented with evidence to warrant such a change. For example, you may have the opinion that the best pizza in London is Joe's Pizzeria. You may hold that opinion for years, until one day, Mike's Pizzeria opens. You try it, and to your shock and delight you find it much better than Joe's pizza. Your opinion has changed! This is a good thing; we should change our opinions based on new evidence, whether we're talking about pizza, or electoral politics, or any other topic.

Slide 10 contains a list of example opinions that people may hold. Can you and your students think of any others?

Bias

As the definition in the previous page states, bias is the sometimes preconceived set of underlying beliefs that influence the way in which we think and act. For example, if you fell off your bike as a child and injured yourself, you may have a bias against bikes as an adult.

Everyone has biases. As Slide 12 points out, they are an important part of our evolutionary arsenal of survival. For example, you and your students probably have a strong bias against sharks. I've never seen a shark in person, but I know that if I did, I'd do everything in my power to get away from it as fast as possible.

The key to navigating a world in which we all have biases is not necessarily to eliminate our biases, but rather to be aware of them and those of others at all times. This is especially true when we're listening to people in positions of power and authority like politicians, or when we're reading the news.

Slide 13 contains two examples of common types of biases that, again, every one of us holds. As consumers of news, we ought to be on the lookout particularly for confirmation bias and affinity bias. These are not the only types of bias that we are prone to, but they are worth covering in more detail.

As Slide 13 points out, confirmation bias is the tendency for us to believe information that backs up what we believe already. Alternatively, confirmation bias leads us to dismiss information that does not line up with what we believe already.

This can work against us as consumers of news in two ways. First, we may fall victim to mis-disinformation more easily, if it backs up our previously-held beliefs. This is what makes conspiracy theories take hold and grow online, since they feed people's biases against individuals, groups of people, their government, or other entities. And second, we may dismiss any news that provides evidence contrary to our beliefs as so-called "fake news". This could lead to an overall erosion of trust in all sources of media except fringe outlets that feed into our confirmation bias, creating a vicious cycle that ends in an unhealthy relationship with reality.

Affinity bias can also play a negative role in our relationship with news. Since affinity bias is our tendency to like people who share similar ideas and thoughts to our own, we may gravitate towards certain sources of news as being always correct, and others as being always wrong, as a result of this bias. Think of the media landscape in the UK: how many conservative news outlets can you name? How about liberal ones? They each garner their own audiences who, in all likelihood, do not hold the others' publications in high regard.

As stated in the previous page, biases are a fact of life. We all have them. And, in many situations, biases can help us navigate our world and our daily lives. Unless those biases are problematic (i.e., racial, gender, or any other discriminatory biases), it's a good idea to simply be mindful of them at all times so that we may try to correct them whenever we come into contact with news.

Slides 17 to 19 contain activities for you to carry out with your students. The activities are described in those slides.

What Goes Into a News Story?

Everyone's got biases and opinions, even journalists. While media organisations with rigorous editorial and ethical standards will have policies in place to minimise this, these biases and opinions can sometimes slip into news articles and mix with facts in a way that makes it difficult to discover where the bias lies.

And, in the worst-case scenario, bad actors can deliberately represent opinions as facts in news reporting, or claim to not be biased in a particular way when in fact they are.

In either scenario, our best defence is constant awareness that opinions and biases can and do make their way into news stories, be it deliberately or otherwise. Remaining on the lookout for this—using the skills learned in the previous sessions—is our best defence against failing to distinguish between facts, opinions, and bias.

Conclusion: Spotlight on Facts, Opinions, and Bias

No matter where you look online, you're bound to find people sharing facts and opinions about any topic that you can imagine. Sometimes, they do so transparently; they make it obvious to the reader when the information that they're sharing is factual, and when it is based on their own opinion. Sometimes, as when people hide or ignore their biases, it may be more difficult for readers to discern fact from opinion.

Having this knowledge is the first step to thinking critically about the information that they come across online.

5. Spotlight on Algorithms, Cookies, and Your Feed

If you're above a certain age, it's likely that you first heard the word "algorithm" in a maths class, and that the only cookies you cared about growing up were the ones baking in your oven. To a young person born in the 21st century, though, algorithms and cookies dominate what they see online, and when they see it.

The learning objectives of this session are:

1. To understand that the media use personal information and algorithms to target specific news at specific people.
2. To recognise how stories can impact how people view and take action in the world.

The learning outcomes of this session are:

1. Students can explain what algorithms are and how they are used.
2. Students can interpret the journey from person to author and back again.
3. Students can create advice about how to protect ourselves online.

This session is divided into the following sections:

1. Defining key terms
2. What is "The Algorithm"?
3. The algorithm & the rabbit hole
4. Tips on beating the algorithm (spoiler: you can't!)

By the end of this session, you will have learned that the information you come across on social media seldom appears there randomly; rather, it is often presented to you specifically based on your browsing habits by algorithms and cookies.

Defining Key Terms

The two most important terms to consider for this session are cookies (or "tracking cookies") and algorithms. Taken together, these two concepts make business on the internet possible. Cookies and algorithms work together to present you with targeted information, from videos on your TikTok feed to advertisements in your Gmail inbox.

Cookie (or "Tracking Cookie")

As Slide 6 points out, a cookie is a small string of data that attaches itself to your browser or device whenever you visit a website. The purpose of these cookies is to collect as much information about you as possible, including which other websites you visit and for how long, which links you click on, which location in the world you're connecting to the internet from, and much more.

Broadly speaking, cookies exist so that advertisers can send you targeted ads via the banners that sometimes appear on websites. You've probably experienced this yourself at some point. Did you ever start seeing ads for shoes everywhere you went online after searching for the word "shoes" on Amazon? Have you ever noticed travel agency advertisements in your Gmail inbox after looking for flights to a vacation destination? You can thank cookies for that.

In some jurisdictions like the European Union, laws regulate how websites can track you using cookies. You may have seen notices on websites whenever you visit them asking if you'd like to "Accept All" or "Reject All" cookies. If you tried connecting to the same websites from jurisdictions that do not have these laws, like Canada and the United States, you would not see these notices.

Social Media Algorithm

As you may have learned in maths class, in the broadest sense, an algorithm is a set of instructions that a computer can follow to perform a given task. In other words, algorithms are rules that determine how data behaves.

Imagine that you're on [insert your favourite social media website here]. This platform presents you with all sorts of information: posts from other accounts, suggestions for new accounts to follow, and advertisements. The platform doesn't do this randomly; it shows you posts, suggested accounts, and advertisements that it thinks you will find interesting.

The way that social media platforms do this is through proprietary algorithms that determine how data (i.e., posts, suggested accounts to follow, advertisements) behave in relation to you specifically.

Meta, TikTok, Google… Name any social media giant, and you'll discover that the reason why they've become the largest, wealthiest companies in the history of the world is down to their proprietary algorithms.

What is "The Algorithm"?

Such is the importance of algorithms to social media platforms that you sometimes see the word referred to as "The Algorithm". This is a misnomer, though, as there isn't a singular algorithm out there determining how Facebook or YouTube work. Still, the term stresses the importance of algorithms to the way that social media websites operate today.

As Slide 9 outlines, the information social media platforms present to us and in which order is determined by algorithms. This is paramount for your students to recognise, because this means that the information they find online is not there naturally; in other words, they are never experiencing a neutral, objective version of Instagram or TikTok. They are each experiencing a version of that platform that has been tailored to them specifically based on information that algorithms (and tracking cookies) have been collecting about them since the first time that they went on the internet.

The purpose of all of this, as highlighted in Slide 10, is to increase the time that the user (i.e., you and your students) spends on social media platforms. More time on the platform equals better engagement numbers and more eyes on advertisements.

Slide 11 contains one example of the algorithm in action. The slide shows a video outlining a report by a journalist from the New York Post who created a YouTube and TikTok account pretending to be a 14-year-old boy. Based on the false statistics that the journalist gave to TikTok, he soon found himself bombarded with videos featuring hate speech towards women and other groups, videos featuring notorious misogynist Andrew Tate, and other questionable content.

This likely happened because algorithms at these platforms determined that 14-year-old boys, like the one that the journalist was pretending to be, engaged with that kind of video content. This determination is, again, made thanks to the collection of an enormous amount of data on the demographic statistics and browsing habits of everyone who goes online, as outlined in Slides 12 to 14.

Slide 15 contains Main Activity One.

The Algorithm and the Rabbit Hole

As the example of the New York Post journalist in the previous section shows, one need only meet certain demographic criteria like age and gender to be shown questionable, sometimes outright hateful and harmful, content. Further engagement with this can then fuel the algorithm to show you more of it, or even more extreme content. This spiral—where being shown extreme content leads to increasingly extreme content ad infinitum—is colloquially known as “the rabbit hole”.

An example of this type of rabbit hole is found on Slide 19. While basic, the example shows how a 14-year-old boy may find himself being presented with misogynistic content on a platform like TikTok starting from an innocent search for advice on finding a girlfriend. Similarly, as Slide 20 shows, a 14-year-old girl may soon find herself presented with content idolising anorexic bodies simply for searching tips on how to look good during the summer.

Unfortunately, because social media platforms benefit from maximising user engagement, it is not always in their interest to make sure that hateful or harmful content does not propagate. For this reason, we always ought to be on the lookout for rabbit holes that algorithms may be trying to send us down, and take active steps to avoid getting lost in one of them.

Tips on Beating the Algorithm (Spoiler: You Can't!)

So far, we've learned that there are cookies and algorithms everywhere, and sometimes they can lead us down rabbit holes of extremist, harmful, and/or hateful content. Is there a way to somehow "beat" algorithms, so that there's no chance that they would present you with this kind of content? The short answer is no. If that seems gloomy, don't worry! It need not be.

After all, algorithms and cookies serve useful purposes, too. They may save you time whenever you're next shopping for new shoes by serving you ads with sales in stores that you like, or alert you whenever there are price drops on flights that you've been considering for your next vacation.

As Slide 23 outlines, there are several strategies that you can deploy to mitigate some of the negative effects of algorithms. These include rejecting cookies whenever you visit a website, using a virtual private network (VPN) whenever you're online, and using your browser's incognito mode whenever feasible.

Perhaps the most important strategy, though, harks back to another that we discussed in 'Spotlight on Navigating Mis-Disinformation': mindful scrolling. This involves being aware that all of your activities online—all of your scrolling and clicking—feed the algorithms that in turn serve you content. Any time that you like a video, or click "Share" on an image, or engage with a social media post in any way, you're shaping the kind of content that you're likely to see in the future.

Just as you should be mindful of what you feed your body, you should be mindful of what you feed your algorithm.

In Slide 25, you'll find Main Activity Two.

Conclusion: Spotlight on Algorithms, Cookies, and Your Feed

The difficulty of talking about social media algorithms is that the platforms that employ them do a very good job of making it seem as if the information they present to you is natural: as if the content that you're viewing is coming to you unfiltered from a common source. However, that is not the case.

As outlined in this session, social media algorithms aren't good or bad. Like any other tool, they can be used for many different purposes, and their effects can be either positive or negative. Many of these effects—both positive and negative—were covered in this session.

Thinking critically about the content that we see online involves recognising this fact about algorithms.

6. Spotlight on Deepfake Images and AI

This session deals with the exciting (and sometimes scary!) new frontier that is artificial intelligence (AI). A year ago, in the middle of 2022, AI was still largely a thing of science fiction. Today, in the middle of 2023, it seems like one can't escape news of how new AI platforms are set to radically alter the ways we work and organise our societies. If so much can change in a year, imagine what the state of AI will be by the time your students graduate from school!

The purpose of this session is to outline some of the current boundaries of AI technology with respect to the generation of photorealistic images, colloquially known as "deepfakes". It will cover what deepfakes are, how they are generated, and how you can spot them in the wild.

The learning objectives of this session are:

1. To explore how fake images may be generated and the impact that this can have when used by the media.
2. To understand and identify the impacts of AI.
3. To describe how students can seek support regarding concerns about AI images.

The learning outcomes of this session are:

1. Students can recall strategies to identify whether an image is real or fake.
2. Students can describe a range of viewpoints on the use of fake images and AI.
3. Students can evaluate the impact that fake images may have on people and communities.
4. Students can seek support about concerns regarding AI images.

This session is divided into the following sections:

1. What are AI-generated images?
2. How are AI-generated images created?
3. How can you tell the difference between an AI-generated image and a real image?
4. What are the impacts of AI?

What Are AI-Generated Images?

As Slide 6 outlines, AI-generated images are created using a growing number of platforms designed to perform this task. These platforms (the most popular of which we will look at in more detail later) have the ability to create realistic images that are, in many cases, simply indistinguishable from reality.

2023 has been the year of the AI-generated image. The technology has become mainstream not only because of its sophistication, but also the ease with which these images can be created by anyone with an internet connection.

How Are AI-Generated Images Created?

More than in any other session, the information in this section is the most liable to change from one day to the next. But, at the time of writing (July 2023), this is what the AI-generation landscape looks like.

As Slide 8 points out, the most popular AI image generation platforms today are Midjourney and Adobe Photoshop, arguably in that order.

Midjourney was initially launched in July 2022, but it came to prominence in early 2023 once the extremely realistic images that it was capable of creating began to be shared widely in public. Midjourney uses what's called "generative artificial intelligence" to create its images based on text prompts from a user. In essence, generative artificial intelligence is able to "learn", as it were, from its experiences, theoretically improving its chances at creating more and more realistic images as time goes on.

To use Midjourney, a user simply has to download a popular chat application called Discord, install it, and then join the Midjourney server. Once in the server, a user can simply write a text prompt into a chat box and wait a few seconds for their image to be generated. This entire process can be completed in less than five minutes.

Slides 10 to 12 contain three examples of images generated by Midjourney, along with the text prompts that were used to create them. As you'll see, the images (particularly in Slide 11 and Slide 12) are indistinguishable from reality. And they were generated in seconds using just a few words written in plain English.

Slide 15 contains an example (that's my dog!) of the Adobe Photoshop AI image generation tool Generative Fill. Launched in mid-2023, this is, at the time of writing, now fully implemented into Adobe Photoshop. As the video in Slide 15 shows, the tool allows any user running the program to manipulate images with simple text prompts, similar to Midjourney. In this example, the prompt "a picnic basket" generated realistic objects in a matter of seconds.

Slide 16 addresses the elephant in the room: the deepfake. The term came to prominence years before Midjourney or Adobe launched their AI image generating platforms. Indeed, it can be traced back to as early as 2017. The term was popularised by a user on Reddit, a message board-like website, who was unfortunately creating pornographic videos by swapping the faces of celebrities onto the bodies of pornographic actors in videos. The story of the origin of deepfakes is fascinating, and was documented by Vice in this article.

Luckily, creating deepfake videos is much more difficult and requires more technical knowledge than creating an AI-generated image. Slide 17 contains a video of a man who has created deepfake videos in which he transforms into Tom Cruise, the actor. The video is fascinating not just because of the quality of the transformation, but also because it demonstrates the difficulty in creating this kind of video.

Keep in mind that all of this is true today. It may just be a matter of weeks or months before deepfake videos are as easy to create as AI-generated images are.

How Can You Tell the Difference Between an AI-Generated Image and a Real Image?

In the previous section, you may have been amazed by the fact that platforms like Midjourney and ordinary users like the Tom Cruise deepfake creator can generate fake images so realistic that they're basically indistinguishable from the real deal. What's more amazing is to think how much more convincing these sorts of images will be in a year, or five years, or ten!

AI image generating technology has become so advanced that we may soon need to brush up on our philosophy and have a discussion about what counts as "real".

Take, for example, the image on Slide 20, which has been copied here:

It's a beautiful image of the sun peeking behind some mountains over a vista of a river and a bridge. The sky is a pleasant pastel peach colour, and the clouds dark orange. You may have seen sunrises and sunsets like the one in this image many times in your life. They're one of nature's most beautiful gifts.

The image above, the one in Slide 20, was generated by Midjourney. It is completely indistinguishable from a human-made image. Does that mean that the image is not real? What does it mean to ask that question at all?

It may be that when we ask if an image is real, what we're really asking is whether the image was created by a human or not. We can argue that this distinction certainly has many important implications.

Slide 21 contains two images that were not created by humans. Yet, unlike the image of the beautiful vista in Slide 20, these images depict human beings. The image on the right in Slide 21 (also copied above) became controversial in particular both for what it depicted, and how it was used:

The image shows a woman being arrested by police officers, perhaps at a protest. It was used by a human rights organisation as the cover for one of its reports, as covered in this news article. However, the image was created by AI; neither the woman, nor the police officers, nor the protest ever really existed. And because of the context within which it was shared, the human rights organisation received lots of criticism from other organisations and observers.

The image was relatively easy to spot as an AI-generated one because certain elements simply seemed "off": the flag the woman is wearing is draped across her in an unnatural way, and some of the soldier's faces seem distorted and lifeless. It's hard to put your finger on it, but the image just seems… yes, "off".

Slide 23 introduces the concept of the "uncanny valley". The concept was created by a Japanese scholar named Masahiro Mori to describe a phenomenon where the more a robot is made to look like a human, the more unease we feel when looking at it. This feeling of unease—the "valley"—is overcome once the robot becomes a perfect copy of a human, fully indistinguishable from a real living person (Slides 24 to 30 outline this concept at play in more detail).

The concept of the uncanny valley may explain the feeling of "offness" that we may feel when we see an AI-generated image that is quite realistic, but not perfectly realistic. This feeling is sometimes difficult to describe in words, but remember that the human brain is wired to recognise humans and human behaviour. Whenever it's presented with something that looks pretty human, but isn't, we feel strange. This cognitive mechanism is one of the tools we have at our disposal to help determine the difference between a real image and an AI-generated one.

This idea is demonstrated in the image on Slide 34, which is copied above.

As Slides 34 to 37 show, while Midjourney is currently able to generate very lifelike human faces, it often fails at generating other objects as convincingly. Note that while Slide 35 shows that the person's face in the image above is quite realistic, her t-shirt is not (as seen in Slide 37).

The psychedelic design in which two Mickey Mouses are partially disembodied and conjoined in a strange way is indicative of this principle. And so, one way to spot AI-generated images is to look for errors in details other than the faces of the humans in the image. Slides 38 and 39 also demonstrate this.

It will soon be impossible to tell the difference between an AI-generated image and an image created by a human. That is already the case with artistic images, like the one in Slide 20. With images featuring humans, we can trust our brains to tell us when something is "off", and look for errors in details other than the faces of the humans in the image.

What Are the Impacts of AI?

The impacts that AI has had so far on our world and how we work are too many to list, but you can see some of them on Slide 42. And, as Slides 43 to 47 show, this is only the beginning; AI technology could have as profound an impact on our lives as did the Industrial Revolution in the 19th century. Some experts have even theorised—hopefully incorrectly!—that we've set down a path with AI that will eventually lead to the extinction of humanity along plot lines that we've seen many times in science fiction.

Chances are, though, that AI's largest impact on your students' lives will not be via this doomsday scenario, but rather through a myriad of changes that will increasingly impact every facet of society, from telephone customer service to diagnostic medicine.

Your students will become adults in a world drastically different from the one in which you grew up. Entire industries that have existed for decades may be made obsolete by AI in the coming years. Everything from job prospects to how your students perform their jobs will be impacted by AI.

As with any big change, this one can sound scary. But as young people, your students will undoubtedly see opportunities for positive change as AI technology engulfs more and more of our lives.

Slide 49 introduces Main Activity Two.

Conclusion: Spotlight on Deepfake Images and AI

You will probably have noticed a few references to how fleeting the knowledge in these pages is. The websites, facts, and techniques described in this session may become obsolete between the time that this handbook was written and the time that it reached you.

This is a factor of the lighting-fast speed with which this technology is evolving. We're familiar with the terms "arms race" and "space race" from 20th century history. It may well be that "AI race" becomes a ubiquitous term to define this part of our century.

This means, in part, that your students are likely to live through a period of unprecedented technological change in their lifetimes. AI may even make sessions like this unnecessary! As teachers, you can only hope that your students enter this new AI-filled world with the cognitive tools that they need to face any challenge, even ones that may be wholly unthinkable to us today.

Handbook on Open Source Digital Investigations for Pop-Up Newsrooms

If you're reading this, congratulations! You're about to embark on an exciting journey into the world of digital open source investigations.

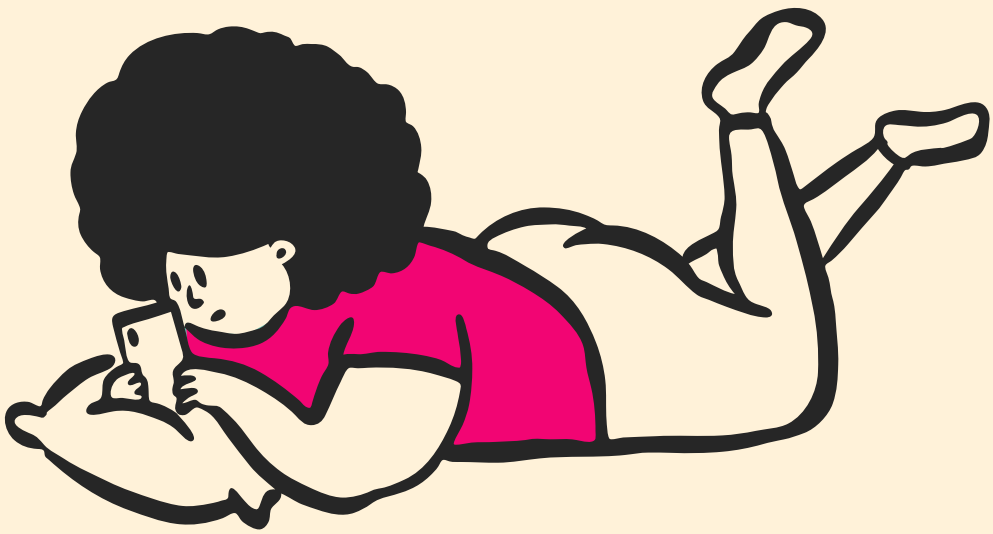
The days when only a few people knew about the wealth of information available online and how to use it to discover important things about our world are behind us. Today, major news organisations the world over are using digital open source information to inform its reporting on a wide range of topics, from breaking news events to financial and environmental investigations. Similarly, non-governmental organisations, community groups, and activist organisations have also found that you can discover and call attention to wrongdoing if you know where to look.

This handbook is intended to provide your Pop-Up Newsroom with the basic knowledge needed to conduct two pillars of digital open source research: **text searches** and **image verification.** The tips and instructions in the following pages will help your students find information online effectively, as well as determine the authenticity of digital images and videos that they see. Taken together, these skills make up the backbone of any newsroom today, and are key facets in the fight against disinformation and misinformation online.

Outline

This handbook is divided into the following sections:

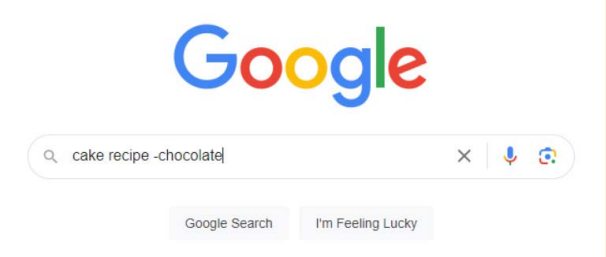
- Glossary of Key Terms
- Text Searches
- Image Verification
- Case Study: Debunking a Viral Tweet
- Conclusion



1. Glossary of Key Terms

Before we begin to learn about text searches and image verification, it's important to first understand a few key terms which you'll come across in your Pop-Up Newsroom:

Term / Acronym	Definition
Open Source Information	We call any information that we can find on the internet "open source". This can include text documents found through a Google search, a video found on TikTok or YouTube, or any other data you're likely to come across on the internet. We contrast open source information with "closed source information", which includes any data that is behind a password (like your e-mail inbox), or that only one person has access to (like a statement from an anonymous source).
Digital Open Source Investigation	This refers to any research that is conducted using information that is freely available on the internet. A digital open source investigation is a powerful form of research because both the researcher and the reader have access to the same information, making it transparent.
Search Engine	A search engine is a platform that presents websites as results based on a prompt by the user. Popular search engines today include Google, Bing, and Yandex. Search engines allow us to find information on the internet easily.
Indexing	Indexing is the process through which a search engine "sees" websites. In order for a search engine to present a website as a result of a search, it must first be indexed by that search engine. Websites that are not indexed cannot be presented as search results. Different search engines have their own ways of indexing websites, so an identical search may yield different results across search engines.
Reverse Image Search	Reverse image search is a method through which you can search whether an image exists online already or not. While a regular search engine search uses text, a reverse image search uses an image. Google, Yandex, Bing, and other search engines each have their own reverse image search platforms.

Operator	An operator is a set of characters that give a search engine special instructions for how to conduct a text search. For example, if you are searching for a cake recipe but you do not like chocolate, you can use the "-" (minus sign) operator to tell Google to exclude all results for cake recipes containing the word "chocolate" by using the operator in this way: 
Geolocation	Geolocation is a process which determines exactly where a picture was taken using only clues in the image. We can use objects like trees, cars, buildings, and other clues to find out the precise location. Geolocation is extremely useful for journalists because it allows them to make sure that a picture really was taken in a specific place.
Chronolocation	While geolocation is about determining the "where", chronolocation determines the "when". When we chronolocate an image, we use clues to estimate the time that it was captured. Think about a picture taken in London on a very sunny day, with lots of people wearing t-shirts and skirts. If you had to guess what time of the year that image was taken, you'd probably say summer, right? Congratulations! You've just chronolocated an image.

Now that we're familiar with these terms, we can get to work on learning about text searching and image verification.

2. Text Searches

Text searches have been the staple of the internet since its early days. Whereas the early internet was filled with a wide variety of search engines, one had come to dominate them all by the early 2000s: Google. Today, the verb "to Google" has become synonymous with "to find information on the internet".

Conducting a text search on a search engine is often the first step to conducting any open source digital investigation. However, it is often the case that text searches return too many results for anyone to check properly. Other times, we can be left wondering if the words we used in our search are the most effective at finding the information that we need. For these reasons, it is important to conduct text searches in as efficient and inclusive a manner as possible. The last thing you'd want as an open source researcher is to discover that a website on page 30 of the Google results list was the one that you were looking for, or that a slightly different combination of keywords was what you needed to get you the required information.

With this in mind, it's important to note that effective text searches include both variety and operators.

Variety

The most important principle for conducting text searches is variety. Doing a single search on a single search engine means that you will almost certainly miss important information.

Imagine that you're looking to buy a new pair of shoes. You may think to use "running shoes" on Google to do this. That would certainly give you many results—maybe even the one that you end up using! But think of all the different ways that you can search for the same information using a variety of terms.
For example:

Aside from variety in search terms, you should always consider variety in search engines. Google is by far the largest and most popular search engine in the world, but it is not the only one. Other search engines include Bing, Yahoo!, and Yandex.

Searching for terms across different search engines will often give you different results, because each search engine "sees" the internet in its own way. They present results to you, the user, based on varying sets of data, including where you live and what kind of device you're using to connect to the internet. For this reason, it's always a good idea to run the same search on several search engines, just in case one of them gives you a result that the other ones do not.

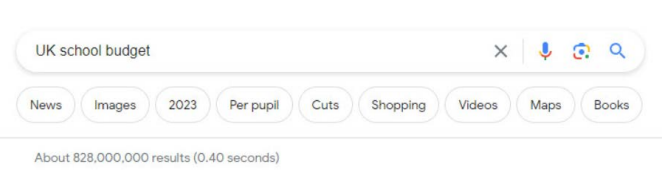
Operators

Using operators is a useful way to ensure that your text searches are displaying both the fullest range of results possible, as well as eliminating the results that are not useful.

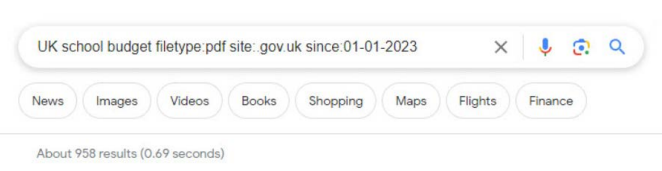
For example, imagine that you are looking for articles from Canadian media talking about King Charles III. What would happen if you went on Google and simply searched "King Charles III"? You would quickly find yourself overwhelmed with millions of articles. The vast majority of them would not be from Canadian media sources. Instead, you'd find yourself wading through every single website that mentions the name "King Charles III", which would mean that you'd have to select only the ones that are relevant to your search by hand. This could take a lifetime!

Thankfully, operators can help us make quick work of this type of search.

Note the number of results in each of these searches. The first one does not use operators, while the second one does:



This search for "UK school budget" has 828,000,000 results! That's way too many for anyone to check properly.



A more targeted search with operators limits the number of relevant results to just 958, which is a much more manageable number.

Below is a list of common operators that we can use to narrow down web searches. All of these operators work with Google, and some may work with Bing and Yandex as well, but you'll have to experiment with them to know for sure.

Also, note that you can use these operators in conjunction with each other, making them even more powerful!

Operator	Name	Description	Example	Result
" "	Quotation marks	Searches for text exactly as written inside the quotation marks.		
-	Minus sign	Eliminates words or phrases from a text search.	cake recipe -chocolate -vanilla	Will return results that contain recipes for all cakes except for chocolate and vanilla.

Operator	Name	Description	Example	Result
*	Wildcard	Substitutes a letter, word, or number from a set of characters.	"For my last birthday I got *"	Will return results of online posts of people talking about what they got for their last birthday.
filetype:	File type	Searches for a specific file type that you determine.	School test scores UK filetype:pdf	Will return only documents in PDF format that contain the words "school test scores UK" in some order.
site:	Site	Limits your search to a specific website or domain.	School test scores UK site:.gov.uk	Will return only results from official United Kingdom government websites that contain the words "school test scores UK".
before:	Before	Limits your search results to before a date that you specify.	Boris Johnson before: 2022-02-14	Will return results for "Boris Johnson" that appeared online before February 14, 2022.
after:	After	Limits your search results to after a date that you specify.	Boris Johnson after: 2023-01-01	Will return results for "Boris Johson" that appeared online after January 1, 2023.

Keep in mind that the rule of variety applies to this section as well. That means that when conducting text searches, it's always a good idea to do so not only on Google, but also on Bing and Yandex. This is because every search platform indexes information differently, meaning that Google can "see" websites that Bing and Yandex can't, and vice versa.

However, the search operators outlined in this section only work with Google. Not all have equivalents in Bing and Yandex. For a list of Bing operators, see this page from Microsoft. Similarly, Yandex has published its own list, which you can access here.

Using operators, and particularly in combination with one another, is a powerful way to discover information that may be hidden among millions of search results. The limit to what you can discover is your imagination!

How might you use operators to search for information to answer these questions?

- What is the total budget for schools where you live? How has that number changed over the years?
- Who regulates school meal standards in your school? How have those standards changed over the years?
- Where does the waste that gets collected in your neighbourhood end up? Where is it recycled, and which landfills does it go to?

3. Image Verification

Have you ever seen a video or a picture on social media and asked yourself, "How do I know that this picture is real?" Unfortunately, social media is full of misinformation and disinformation. Either on purpose or by accident, people share images all the time that are not from the time and place that they claim them to be. This means that we ought to always be sceptical of images that we see shared on social media until we are able to independently verify them.

We can determine whether an image is authentic by employing the image verification process. When done correctly, this can tell us if an image is new to the internet, or if it's been around for a while. It can also tell us where precisely an image was taken, and in many cases, when.

When we verify images, we gain the knowledge to answer the question "How do I know if this picture is real?" with confidence.

The Image Verification Process

Think of all of the pictures and videos that you see on social media. How do you know when and where they were captured? Most of the time, we rely on the person sharing the image to give us this information. But sometimes, people make mistakes, and this information is wrong. More worrying is when someone lies about the context of an image. This is what's called misinformation and disinformation, respectively, and together they can cause many problems for individuals and societies.

Thankfully, when we see an image online, we do not have to trust the person sharing it for its context. Instead, we can find out that context by ourselves. This is called the image verification process.

When you verify an image, you find out when it was taken and when it first appeared online. It acts as a shield against misinformation and disinformation: with it, we're much less likely to fall for misinformation or disinformation.

The image verification process contains three steps. It is extremely important that you carry out these steps in order: you cannot do step #2 before you've done step #1, and you cannot do step #3 before you've done steps #1 and #2. If you do the process out of order, you're very likely to get an incorrect answer, so always keep that in mind.

Each step of the image verification process is meant to answer one question:

1. Is this image new to the internet, or has the image been seen online before?
2. Where was the image taken?
3. When was the image taken?

We "ask" each of these questions by conducting each of the three steps in the image verification process. Those steps are:

1. Reverse image search: this will help determine whether an image exists on the internet already. If it does, then you'll find out its original context. If it's never been seen online before, then you can continue to step #2.

2. Geolocation: this is the process by which we determine exactly where an image was captured using clues in the image.

3. Chronolocation: this is the process by which we determine when an image was taken, also using clues in the image. Chronolocation can be quite difficult, and the results much less accurate than geolocation.

Remember: always do these steps in order!

In the next section of this handbook, we'll go through an example of how each of these steps can help us get to the bottom of an imaginary viral tweet.

Case Study: Debunking a Viral Tweet

One important use of the image verification process is to debunk viral stories on social media. You know the ones: the TikTok videos, Instagram Stories, or Twitter pictures that get lots and lots of views. Many viral videos are true, but many are false. This is because sometimes, for many different reasons, people use old images from past events to claim that something new is happening right now.

This is why whenever you come across an image - viral or not - it's a good idea to verify its contents for yourself.

For example, imagine that you wake up one morning and see this tweet, which was sent on July 15, 2023:

In this fictitious tweet, an imaginary character named John Smith shares an image claiming to show a church on fire the day that the tweet was shared: July 15, 2023.

This person—someone named John Smith—claims that "the big church" near their house is on fire. They've shared an image of a building that looks like a church on fire. The image is real. But how do we know that John isn't lying? How do we know that he didn't take an old image from the internet, and that he's sharing it pretending that this is happening near his house?

To answer all of these questions, we use the image verification process. Remember the steps:

1. Reverse image search
2. Geolocation
3. Chronolocation

With all this in mind, let's verify the image!

Reverse Image Search

You already knew that search engines like Google allow you to search for text. But did you know that they also allow you to search for images? A reverse image search is just like a text search, but instead of using words to look for results, we use a picture.

We can do this by doing a reverse image search.

To do a reverse image search, we first save the image onto our computers. We can do this by right-clicking on the image and pressing "Save as…".

Once the image is saved on your device, you can go to any of these image search engines to search for the image:

https://images.google.com

https://www.bing.com/images/feed

https://yandex.com/images?

Let's use Google Images for this example.[1]

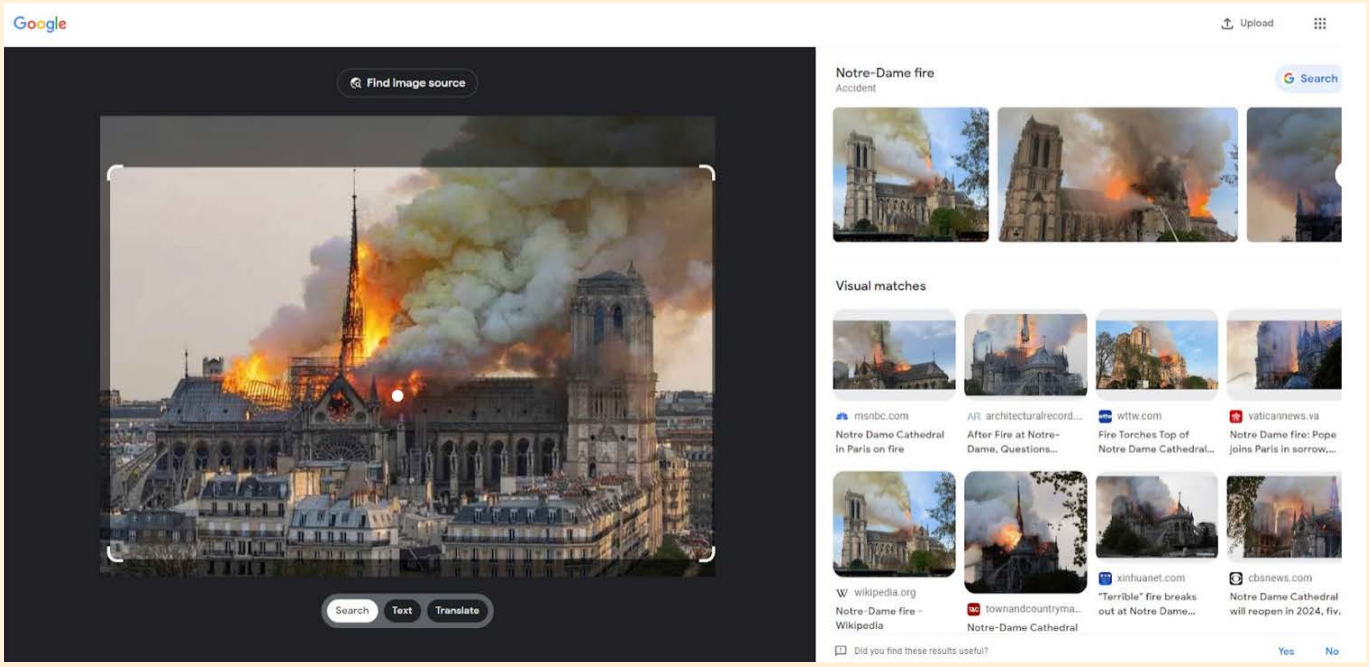
When we search for the image of the burning church on Google Images, we see that there are many results. This means that this exact same image of the burning church has been online for a long time.

In fact, there are so many images showing this church on fire that Google Images recognises it immediately, and tells us right away in the results: this picture is from when the Notre-Dame Cathedral caught fire!

Remember the time on the tweet in the previous page that we're verifying? It was sent on July 15, 2023. Let's put that nugget of information to one side for a moment, since it'll help us chronolocate the image later.

We've just completed the first step in the image verification process: the reverse image search. We've found evidence that the picture shows Notre-Dame Cathedral, which is located in Paris (if you didn't know this, a quick Google search would have given you the answer).

How do we know that the cathedral on fire in the viral tweet is actually Notre-Dame, though? Well, the clues to that answer are in the image itself. All we have to do is geolocate it.



These are the results when you search for this image on Google Images. Note that at the top right of the screen, Google suggests that the image is from the Notre-Dame fire.

[1] Just for this example, though. It's always a good idea to also check other image search engines like Yandex Images and Bing Images whenever you're doing this.

Geolocation

As you'll now know, the process of geolocation determines exactly where a picture was taken using only clues in the image. Anything can be a clue, whether it's trees, cars, rivers, mountains, or roads.

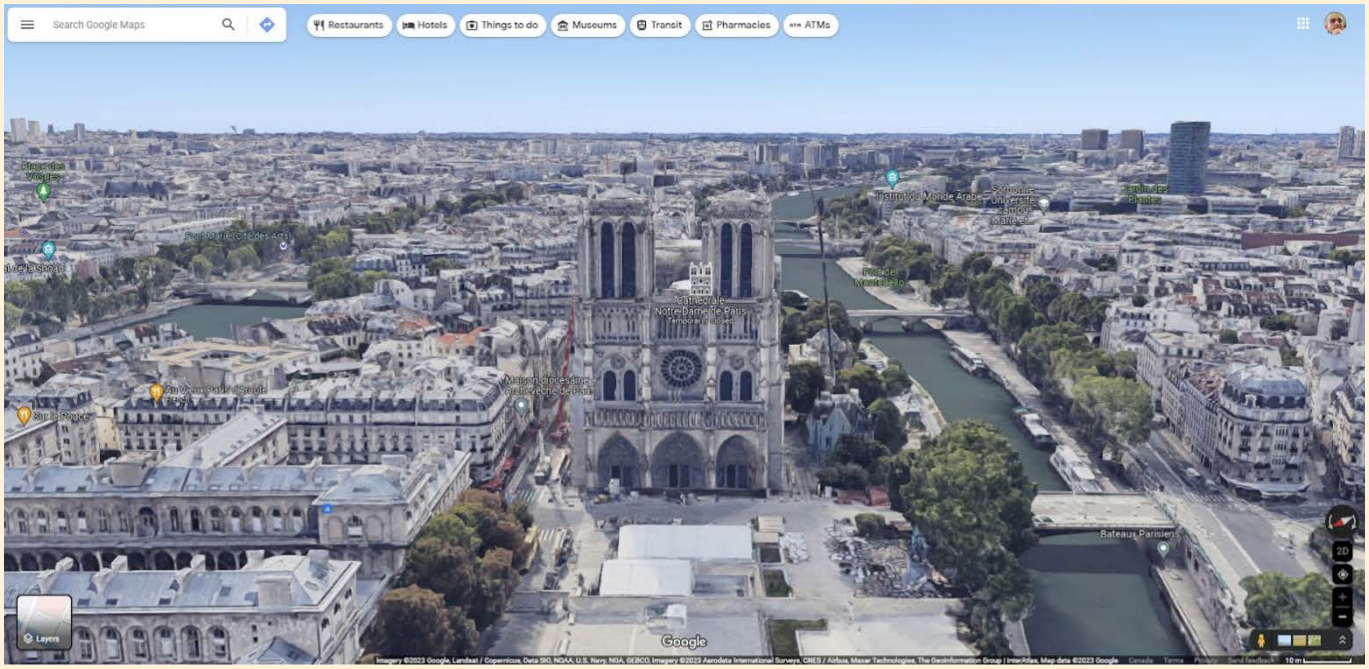
In this case, none of those objects are in the image. But the image does contain lots of details of the cathedral itself, and of the buildings around it. To geolocate an image, you need to compare all of the details in the image that you're verifying with images you find online that you think may be of that place, or in this case, of that cathedral.

When we did the reverse image search, Google suggested to us that the church in the image was the Notre-Dame Cathedral in Paris. We can confirm this—or in other words, we can geolocate the image—by comparing it to images that we know for a fact are of the Notre-Dame Cathedral in Paris.

Luckily for us, Notre-Dame is one of the most famous landmarks in the world, so there are more than enough images of it online showing how it looked before, during, and after the fire. Where we find these images is up to our imagination. We could simply search for "Notre-Dame Cathedral Paris" on Google to get lots of pictures of the building, or we can search for the same words on YouTube to find videos of it. We could also look on social media websites like TikTok, Instagram, or Facebook for pictures of the building.

In this case, we can also use a neat feature that Google Maps has, which is the ability to see buildings in 3D. Not every building in the world is modelled in 3D on Google Maps, but because the Notre-Dame Cathedral is so famous, it is.

Let's take a look at what the Cathedral looks like on Google Maps in 3D:

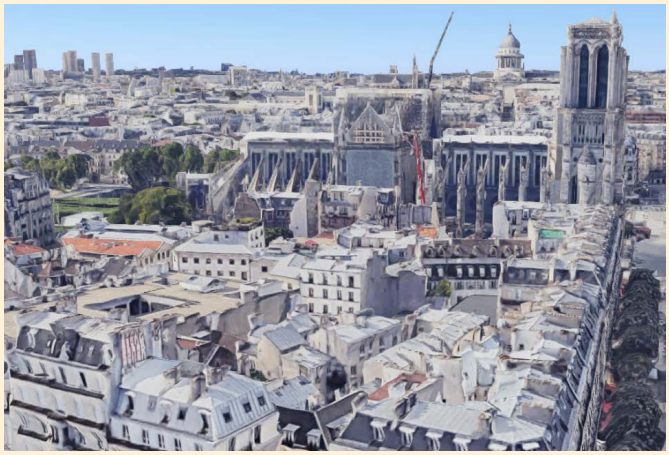


Neat, isn't it? But how does this help us geolocate the picture in the viral tweet?

We can use Google Maps to examine the Cathedral and the area around it to see if it looks anything like what we see in the image in the viral tweet.

The screenshot from Google Maps above doesn't look a whole lot like what we're seeing in the viral tweet's image, right? We can keep changing the angle of our view on Google Maps to see if at any point what we see matches what the picture in the tweet shows. If we spend just a couple of minutes doing that, eventually we'll find the bottom right image.

Here, you'll see a comparison of the image in the imaginary viral tweet (top) and a screenshot of Google Maps showing the Notre-Dame Cathedral in Paris, France (bottom). The angles don't match exactly, but note that the details of the Cathedral and the buildings in the foreground are the same. Also note that the dome in the background of the Google Maps image is not visible in the picture in the imaginary viral tweet because it was obscured by the smoke.



At this point, we don't have to take Google's word that the picture that we've reverse image searched for is the Notre-Dame Cathedral in Paris. After all, even Google makes mistakes sometimes! We've geolocated the image successfully, which means that we've proven that it actually does show the Cathedral.

Chronolocation

Now that step one (the reverse image search) and step two (geolocation) are done, we can move on to step three: the chronolocation.

As discussed above, chronolocation is a fancy way of saying "to determine when". In the image verification process, chronolocation means determining when an image was taken. We must do this step last because without knowing where the image in question was captured, it's much more difficult to determine when.

While reverse image searching and geolocation are relatively straightforward processes, chronolocation can quickly get very complicated, even for the experts. In some cases, accurate chronolocation is simply not possible.

Luckily, that's not the case for us and the imaginary viral tweet of the burning Cathedral.

After all, we found out through reverse image searching and geolocating that the image in the tweet is from the Notre-Dame Cathedral in Paris.

Remember the time on the viral tweet? The screenshot says that it was sent on July 15, 2023. John Smith—our imaginary tweeter—suggests in his tweet that the church was on fire that day.

But now that we know where the picture is actually from, we can easily confirm when Notre-Dame was last on fire with a simple Google search for "Notre-Dame fire". When we do this, we see immediately that the church was last on fire on April 15, 2019, more than four years before John Smith tweeted the picture.

Chronolocating is the third and final step of the image verification process, which means one thing: congratulations! You've verified the image. In doing so, you've debunked the viral tweet, and found the irrefutable evidence you need to speak without a doubt about the true origin of the imaginary viral image. Well done!

4. Conclusion

Open source digital investigation methods like the ones outlined in this document represent the cutting edge of journalism today. Over the past decade, post-secondary institutions primarily in North America and Western Europe have taken note of these methods and begun to teach them in their classrooms to the journalists of tomorrow. However, these classes are far from the norm, even in the most prestigious institutions.

In taking inspiration from this handbook, you will help your students not only to seek answers to important questions affecting them in their communities, but you will also help them build useful skills to increase their chances of success in life as adults. It may be that, by working through these pages together, you'll be doing much more than simply guiding your students through their Pop-Up Newsroom experience. You may be planting the seeds of inquiry and an interest in technology and research that may lead your students to become the journalists of reference of the future.

The most exciting aspect of open source digital investigative methods is that they can be applied in ways to help answer a myriad of questions. As cliche as it may be to say that imagination is the limit, it is truly the case that the methods outlined in this handbook will help your students explore questions that you yourself would never have thought to ask.

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