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Lesson plan: Mixed signals: verifying online information

Grades: 7-9

Duration: 60-75 minutes

Overview:

In this lesson, students examine two websites about unlikely animals and learn how to effectively evaluate online sources.

Learning outcomes

Students will:

- Learn to distinguish between strong and weak signals of reliability online
- Practice finding strong signals
- Evaluate the reliability of an online source

Preparation and materials

- Ensure students can access the [House Hippo Foundation](#) and [National Birmingham Roller Club](#) websites
- Prepare to show the video: [Digital literacy 101: digital media are networked](#)
- Print or prepare access to digital copies of the **Verifying a website: record your thinking** worksheet and the **Verifying a website: strong and weak signals** handout (one per student)

Procedure

Start by having students watch the video [Digital literacy 101: digital media are networked](#). (You can do this in class or assign it as homework.)

Ask students: What makes it difficult to know whether something you see online is true or not? (It's easy to post and spread fake content online.) Ask them what they do, if anything, to verify what they see online. Let students share their answers but don't comment on them.

Facts and sources

Explain to students that it's usually more important to verify a source (where you got a fact) than the fact itself. Unreliable sources sometimes will have some accurate facts: what they usually do is present a mix of true and false facts or cherry-pick facts that support their side and leave out others that don't.

Verifying a source basically means asking two questions:

First, do they have a record of giving good information and correcting their mistakes?

Point out that all sources have a bias of one kind or another (science sites only cover science stories, newspapers only report things that are seen as newsworthy), but a trustworthy site should not have an agenda – something that is more important to them than giving you accurate information, like selling you something or making you believe one side of an issue.

Second, if it's not a general-purpose source like a newspaper, are they a genuine expert on that topic?

Remind students that being an expert in one area doesn't make you an expert in everything: you wouldn't ask a psychiatrist to fix your teeth.

Not having an agenda is not the same thing as being neutral: an expert will probably have stronger opinions on their topic than someone who doesn't know much about it. But an expert bases their opinion on what they know. Someone with an agenda bases their opinion on what they believe, or what they want you to believe.

House hippos and roller pigeons

Divide students into pairs. Have one member of each pair evaluate one of the two websites, **House Hippo Foundation** and **National Birmingham Roller Club**.

Instruct each student to look at their website and take any steps that they can think of to find out if it is trustworthy or not. (At this stage each student should only look at the website they have been assigned, not their partner's.) Have students complete the handout

Verifying a website: record your thinking.

Once students have finished reviewing the website (you may wish to set a time limit) have them share their findings with their partners. What did they decide about the site's reliability, and why?

Have students look briefly at the site their partners evaluated. Do they agree with their partner's evaluation? Why or why not?

Each pair of students should now discuss which site would be more useful to them as a source for a project on unusual animals.

Strong and weak signals

Now, distribute the handout **Verifying a website: strong and weak signals** and explain that on the internet, it's easy to fake the things that make a website or similar source look real, like a clean layout, contact information, or a name that includes words like "foundation" or "institute." Even the web address doesn't tell you very much because anyone can buy a .org address and most universities let professors set up personal sites on their .edu addresses. That's why these are weak signals.

At the same time, some things that we might think make a website less reliable, like spelling or grammar mistakes or ads, are misleading. A lot of legitimate sources like newspapers have ads on the page, and enthusiastic amateurs can make mistakes when making a website that's perfectly reliable.

The other problem is that there are a lot of possible weak signals. This means that using them to verify a website or other source can take a lot of time. It also means that you're more likely to think a source that's reliable isn't because you can always find some weak signals that indicate something isn't trustworthy.

What works better is to focus on a small number of strong signals. Ignore what the source says about itself – that can be easily faked – and find out what other sources say about it:

- **What does a Google search show?** Search for the source and see what comes up. Does anyone else mention it at all? Do other sources – especially ones you know are trustworthy – treat it like it's a trusted expert source? Does a News search give you any better information?
- **What does Wikipedia say?** Like Google, Wikipedia isn't a perfect source, but it's mostly reliable about basic facts. It will usually tell you the overall consensus on a topic – whether a source is generally seen as reliable, whether an organization has an agenda that means you have to read it with skepticism, and whether something really exists or not.
- **What do fact-checkers say?** Fact-checkers like Snopes or Hoaxeye specialize in debunking fakes and hoaxes. You can search them to see if something has already been debunked.
- **What do sources that you know are reliable say?** It's always good to check against sources that you already know are reliable.

Now, ask students to re-evaluate both websites using only the things listed under the **strong signals** column. Tell them to stop as soon as they think they have an answer.

Give students about five minutes and then ask them what they found. Point out that there are a lot of weak signals that make the house hippo page look reliable (clean design, real photos, .org address, lots of information) and make the roller pigeon page look unreliable (ads, .us address, it's selling something). But looking at any of the strong signals will quickly show both roller pigeons and the **National Birmingham Roller Club** are for real and that house hippos, and the **House Hippo Foundation**, are fake.

Assessment (optional): Have students write a paragraph based on their re-evaluation before taking it up in class. Use the following rubric to evaluate the responses. (Statements based on strong signals are indicated in **green**, ones based on weak signals are in **red**.):

Grade	Example
An excellent response will: <ul style="list-style-type: none"> Correctly evaluate the reliability of the website Provide at least one example of strong signals and clearly explain how they support the evaluation Not include any weak signals 	The House Hippo website is unreliable. The Wikipedia entry for 'House Hippo' shows that they are a parody, which means the website must be a parody too. A Google search for 'house hippo foundation' or the web address doesn't find anything except the website. A News search for 'house hippo' finds lots of articles about a house hippo PSA that was made to teach people not to believe everything they see online.
A confident response will: <ul style="list-style-type: none"> Correctly evaluate the reliability of the website Provide at least one example of strong signals and clearly explain how they support the evaluation 	The Roller Club website is reliable. It gives lots of information on the topic. A Google search finds lots of references to it from other sources, including the Better Business Bureau, which is a reliable source. Looking up 'Birmingham Roller' on Wikipedia shows that they are real which shows there's no reason to think it's fake.
A competent response will: <ul style="list-style-type: none"> Correctly evaluate the reliability of the website Provide at least one example of strong signals 	The Roller Club website is reliable. A Google search finds lots of references to it from other sources, including the Better Business Bureau, which is a reliable source. The website has lots of information about the topic.
A beginning response will: <ul style="list-style-type: none"> Provide at least one example of strong signals 	The Birmingham Roller site is unreliable. It doesn't have an About Us page and there are ads trying to get you to buy things. It doesn't have a Wikipedia entry.
A insufficient response will: <ul style="list-style-type: none"> Not provide any examples or strong signals, even if the evaluation of the website is correct 	The House Hippo site is reliable. It has a .org address and it is a non-profit. The About Me page says who is behind the site. The House Hippo site is unreliable. The photos look fake and there is no such thing as a house hippo.

Worksheet: **Verifying a website: record your thinking**

Use this worksheet to record your thinking as you verify one of the following websites:

- **House Hippo Foundation**
- **National Birmingham Roller Club**

Decide with your partner which of you is verifying each website before you start.

Do anything you can think of to find out if the site is a reliable source or not.

In the first column, record every clue you find that helps you tell whether or not the site is reliable.

In the second column, record whether that clue makes you think the site is more or less likely to be reliable.

In the third column, record why the clue makes you think the site is more or less likely to be reliable.

Clue	More or less reliable?	Why do you think so?

Overall, do you think this website is trustworthy or not?

Yes

No

Handout: **Verifying a website: strong and weak signals**

Verifying a source of information (a website, a person, an article, etc.) means asking two questions:

- 1. Is the source trustworthy?**
- 2. Is the source an expert on the topic?**

A **trustworthy** source is one that has a good record of giving good information and correcting its mistakes.

All sources have a bias of one kind or another (science sites only cover science stories, newspapers only report things that are seen as newsworthy) but a trustworthy site should not have an agenda - something that is more important to them than giving you accurate information, like selling you something or making you believe one side of an issue.

An **expert** source is one that knows a lot about a particular topic.

Remember that being an expert in one area doesn't make you an expert in everything. You wouldn't ask a psychiatrist to fix your teeth.

People and groups don't have to be totally neutral to be reliable!

An expert will probably have stronger opinions on their topic than someone who doesn't know much about it. But an expert bases their opinion on what they know. Someone with an agenda bases their opinion on what they believe, or what they want you to believe.

So, how do we find out if something is a trusted expert source?

You don't have to read a whole website or article to find out. In fact, you're better off not reading it until you've found out.

Instead, start by making sure that you're looking at the original source: is there anything that suggests the information originally came from somewhere else? If so, find the original source and then check that.

Once you're sure you're at the original source, look for the strong signals that it is a trusted expert source. If there are no strong signals that show a source is trustworthy, that doesn't mean that what's in it is wrong or fake: it just means that you need to find a better source.

Strong signals

- ✓ **What does a Google search show?** Search for the source and see what comes up.

Does anyone else mention it at all?

Do other sources – especially ones you know are trustworthy – treat it like it's a trusted expert source?

Put phrases in quotes to get more relevant results:

“roller pigeon” **instead of** roller pigeon

If you're looking up a website with a common name, you may need to search for the web address. (Make sure to put it in quotes.)

“Lifespan.org” **instead of** Lifespan

If most of the results are the website itself, add a minus sign and then the web address, with no space between to skip those:

“house hippo foundation” -househippofoundation.org

If there's an author listed, or an expert quoted in the article, you can search for their name too. If it's a common name you can add the name of the website or organization or the topic they're supposed to be an expert on.

✓ **What does a News search show?** Remember that Google indexes almost every site on the Web. Switching to the News tab narrows your search to verified news sources. (They make mistakes sometimes, but overall the News search is a lot more reliable.)

You can also use bit.ly/news-search, a custom search engine that searches ten Canadian and international news sources at once.

✓ **What does Wikipedia say?** Like Google, Wikipedia isn't a perfect source, but it's mostly reliable for basic facts. It will usually tell you whether something really exists or not, whether a source is generally seen as reliable, and whether an organization has an agenda that means you have to read it with skepticism.

You can search Wikipedia from Google by adding “Wikipedia” to your search.

You may want to search for the topic instead of the source. This helps you find out the consensus on the topic (what most people who are experts on the topic generally agree is true.) If what you really want to know is whether Roller Pigeons are real or not, it might make more sense to search for “roller pigeons” than for “Central Roller Club.”

A person or source might not have their own Wikipedia entry but might be mentioned in others. If searching Wikipedia doesn't work, try doing a Google search for the source plus the word “Wikipedia”.

Sometimes people make misleading changes to Wikipedia articles. Those almost always get changed back within a few minutes by Wikipedia's editor bots, but you can double-check by clicking on the Talk tab (which shows you if editors are arguing about changes) or the View History tab (which shows you what changes have been made to the article.)

You can quickly search a Wikipedia article, and most web pages, by pressing CTRL-F (on a PC) or Command-F (on a Mac.) In mobile browsers tap three dots at the top or bottom of the window and tap Find in Page.

✓ **What do sources that you know are reliable say?** It's always good to check against trusted, expert sources.

You can ask your teacher for help finding trusted expert sources on different topics.

You can also search bit.ly/science-search, which searches ten trusted science sources as once.

✓ **What do fact-checkers say?** Fact-checkers like Snopes or Hoaxeye specialize in debunking fake stories and hoaxes. You can search them to see if something has already been debunked.

Remember that anyone can call themselves a fact-checker. Make sure they've agreed to the International Fact Checking Network's Code of Principles and been verified by the IFCN:

<https://ifcncodeofprinciples.poynter.org/signatories>

You can also search bit.ly/fact-search, a custom search engine that searches multiple fact-checkers at once.

Weak signals

Besides looking for strong signals, you may need to remind yourself not to pay attention to weak signals. These are things we might **think** tell us something about whether a source is reliable or not, but are actually meaningless or misleading. They can also take a lot more time to check than strong signals!

It's important to know **not** to pay attention to these because people and groups that try to spread bad information can use them to fool you.

✗ **Name or title.** Anyone can call themselves an "institute" or a "university" online. Use Google or Wikipedia to see if they're for real.

✗ **Web address.** Anyone can buy a .org web address, and a lot of universities let professors have personal pages on their .edu addresses. The only thing a web address can tell you is whether you're on the real page or a fake. Google the site to make sure it's the right web address.

✗ **"About Us" page or contact info.** The "About Us" page is what the source is telling you about itself. Why should you believe that? Use Google or Wikipedia to see what other people say.

✗ **How much information there is, or how useful it is to you.** It's great when you find a site that looks like it has all of the information you need, but that doesn't mean it's reliable!

✗ **How it looks.** It's not hard to make a professional-looking website, and sometimes reliable sources (like government agencies or universities) don't update the look of their website for a long time.

✗ **Links out.** Links are good when they lead you to a trusted expert source. But just having links to other sources doesn't mean this source is reliable.

✗ **No ads.** Lots of trusted sources, like newspapers, have ads. That doesn't mean they're fake!

✗ **Giving both sides of a story.** It's definitely bad when sources **cherry-pick** by only giving you information that supports one side of an issue. But a lot of sites that spread bad information on purpose do it saying they're "just asking questions" or "showing both sides" on a topic where there aren't really two sides, like whether vaccines are safe or whether the Holocaust happened.

When there's a solid **consensus** on something, providing information that is outside the consensus can actually spread misinformation. Just because some people believe the pyramids were built by aliens doesn't mean an article on the pyramids has to mention that!

To find out what the **consensus** is on a topic, try Wikipedia. To save time, search the article for a key word: for example, you can search for "aliens" in the Pyramids article to see if any experts believe that aliens built them (they don't) or search for "autism" in the Vaccines article to see if any experts believe vaccines cause autism (they don't).

To get the consensus on a news story, do a Google search and check the News tab. If no news sources are covering it, or just a small number, wait until it's been confirmed by others.