



BRIDGING SCIENCE AND JOURNALISM CURRICULUM PACKET

This curriculum packet includes lesson plans for high school science teachers to help their students make the connection between science and journalism. This packet is plug and play - meaning that one can decide to use all lesson plans or just a few. The choice is up to you!

Each lesson plan includes:

- Overview of the activity
- NGSS standards the lesson matches to
- Student learning objectives
- Instructions for the activity (and relevant answer keys if needed)
- Lesson outcomes
- Assessment options

This curriculum aims to help students build their creative and critical thinking, problem solving, communication and writing skills while exploring aspects of science phenomena in San Diego while using journalistic and scientific approaches to complete each lesson.

The lesson plans included are:

- Geoscience
- Storytelling with Science
- How to Think Like a Journalist
- Engineering a Sensor
- Mapping with Science Data

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This project is part of the Center for Science and Media at San Diego State University in the School of Journalism and Media Studies. The Center for Science and Media is a collaboration of the School of Journalism and Media Studies with the College of Sciences in the areas of research, public service, and curriculum. The Center's mission is to educate the public about science, through the strategic and ethical use of media.

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HOW TO THINK LIKE A JOURNALIST

Lesson Plan Created by
Lorie Hearn, Executive Director/Editor *inewssource*

ABOUT

This lesson focuses on how to think like a journalist, asking critical questions and verifying facts.



NGSS STANDARDS

Practices: Asking Questions and Defining Problems, Engaging in Argument from Evidence, Obtaining and Evaluating and Communicating Information

Disciplinary Core Ideas: ESS3C-Human Impacts on Earth Systems, ESS2A-Earth Materials and Systems, PS4C-Information Technologies and Instrumentation

Cross Cutting Concepts: Patterns, Cause and Effect, System and System Models, Structure and Function, Stability and Change, Interdependence of Science, Engineering, and Technology, Influence of Science, Engineering, and Technology on Society and the Natural World

LEARNING OBJECTIVES

Students will be able to:

- Learn the principles of journalism and how to apply them to research and to daily life.
- Build and sharpen critical thinking skills.
- Learn to find the “ story” in the facts.
- Learn about primary and secondary documents.
- Master fact-checking protocols.

ACTIVITY

Students attend a news conference, announcing the results of air quality testing in neighborhoods near Interstate 5. The head of the Air Quality Control District for San Diego County says the air has never been better. He/she says the air is most improved in Barrio Logan, which has had a history of low air quality because of the amount of industry, including idling big rigs. They urge the reporters to spread the word so San Diego can attract more tourists to help the economy.

Instructions

1. Before the news conference, students must read [The Elements of Journalism](#). Discuss the article and include talk about the difference between news and opinion and how to tell the difference.
2. Students attend the news conference, take notes and ask questions.
3. What is the news? What is important for people to know? Write a short story in a text format, TV news format or series of tweets.
4. Have students load their stories into Google docs.
5. Then highlight and number each "fact" in their stories. They can use the Comment function to do this. For example, 1. Jason Appleby is the director of the Air Quality Control District for San Diego County. OR 2. Air quality in Chicano Park has improved 25 percent since 2017. Etc.
6. In the comment bubble for each "fact," note, if it is true or false or not known.
7. How will you get to the truth? To get to the truth, journalists use critical thinking skills and fact-checking. Discuss the difference between primary and secondary documents and their value. (Descriptions and discussion aids below.) What documents do you need to determine truth? Who can help you get them?
8. Read an example of how to fact-check a story. [Here](#) -- "The Excruciating Part"
9. Students go through their "facts" and suggest ways they can fact-check them.
10. Using the Politfact ["Truth-O-Meter"](#) fact-checking measurement, rate your story -- as originally written -- True all the way to Pants on Fire.
11. Going back to the news conference and the air quality source, discuss how could they have asked better questions to get at the truth more quickly?

OUTCOME

The students will be able to:

- Participate as a reporter in a news conference, learning to think critically and quickly and to challenge assumptions.
- Question "facts" as true, false or not known.
- Learn to find sources to verify information.
- Understand the importance of meticulous fact-checking for credibility.

ASSESSMENT

Students can be assessed by:

- Did they ask questions at the news conference?
- How impartial was the story they wrote?
- How well did they identify "facts?"
- How well did they do at finding ways to confirm or contradict the "facts?"

The elements of journalism

In their book [The Elements of Journalism](#), Bill Kovach and Tom Rosenstiel identify the essential principles and practices of journalism.

Here are 10 elements common to good journalism, drawn from the book.

Journalism's first obligation is to the truth

Good decision-making depends on people having reliable, accurate facts put in a meaningful context. Journalism does not pursue truth in an absolute or philosophical sense, but in a capacity that is more down to earth.

“All truths – even the laws of science – are subject to revision, but we operate by them in the meantime because they are necessary and they work,” Kovach and Rosenstiel write in the book. Journalism, they continue, thus seeks “a practical and functional form of truth.” It is not the truth in the absolute or philosophical or scientific sense but rather a pursuit of “the truths by which we can operate on a day-to-day basis.”

This “journalistic truth” is a process that begins with the professional discipline of assembling and verifying facts. Then journalists try to convey a fair and reliable account of their meaning, subject to further investigation.

Journalists should be as transparent as possible about sources and methods so audiences can make their own assessment of the information. Even in a world of expanding voices, “getting it right” is the foundation upon which everything else is built – context, interpretation, comment, criticism, analysis and debate. The larger truth, over time, emerges from this forum.

As citizens encounter an ever-greater flow of data, they have more need – not less – for suppliers of information dedicated to finding and verifying the news and putting it in context.

Its first loyalty is to citizens

The publisher of journalism – whether a media corporation answering to advertisers and shareholders or a blogger with his own personal beliefs and priorities – must show an ultimate allegiance to citizens. They must strive to put the public interest – and the truth – above their own self-interest or assumptions.

A commitment to citizens is an implied covenant with the audience and a foundation of the journalistic business model – journalism provided “without fear or favor” is perceived to be more valuable than content from other information sources.

Commitment to citizens also means journalism should seek to present a representative picture of constituent groups in society. Ignoring certain citizens has the effect of disenfranchising them.

The theory underlying the modern news industry has been the belief that credibility builds a broad and loyal audience and that economic success follows in turn. In that regard, the business people in a news organization also must nurture – not exploit – their allegiance to the audience ahead of other considerations.

Technology may change but trust – when earned and nurtured – will endure.

Its essence is a discipline of verification

Journalists rely on a professional discipline for verifying information.

While there is no standardized code as such, every journalist uses certain methods to assess and test information to “get it right.”

Being impartial or neutral *is not* a core principle of journalism. Because the journalist must make decisions, he or she is not and cannot be objective. But journalistic *methods* are objective.

When the concept of objectivity originally evolved, it did not imply that journalists were free of bias. It called, rather, for a consistent method of testing information – a transparent approach to evidence – precisely so that personal and cultural biases would not undermine the accuracy of the work. The method is objective, not the journalist.

Seeking out multiple witnesses, disclosing as much as possible about sources, or asking various sides for comment, all signal such standards. This discipline of verification is what separates journalism from other forms of communication such as propaganda, advertising, fiction, or entertainment.

Its practitioners must maintain an independence from those they cover

Independence is a cornerstone of reliability.

On one level, it means not becoming seduced by sources, intimidated by power, or compromised by self-interest. On a deeper level it speaks to an independence of spirit and an open-mindedness and intellectual curiosity that helps the journalist see beyond his or her own class or economic status, race, ethnicity, religion, gender or ego.

Journalistic independence, write Kovach and Rosenstiel, is not neutrality. While editorialists and commentators are not neutral, the source of their credibility is still their accuracy, intellectual fairness and ability to inform – not their devotion to a certain group or outcome. In our independence, however, journalists must avoid straying into arrogance, elitism, isolation or nihilism.

It must serve as an independent monitor of power

Journalism has an unusual capacity to serve as watchdog over those whose power and position most affect citizens. It may also offer voice to the voiceless. Being an independent monitor of power means “watching over the powerful few in society on behalf of the many to guard against tyranny,” Kovach and Rosenstiel write.

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The earliest journalists firmly established as a core principle their responsibility to examine unseen corners of society.

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The watchdog role is often misunderstood, even by journalists, to mean “afflict the comfortable.” While upsetting the applecart may certainly be a result of watchdog journalism, the concept as introduced in the mid-1600s was far less combative. Rather, it sought to redefine the role of the journalist from a passive stenographer to more a curious observer who would “search out and discover the news.”

The watchdog role also means more than simply monitoring government. “The earliest journalists,” write Kovach and Rosenstiel, “firmly established as a core principle their responsibility to examine unseen corners of society. The world they chronicled captured the imagination of a largely uninformed society, creating an immediate and enthusiastic popular following.”

Finally, the purpose of the watchdog extends beyond simply making the management and execution of power transparent, to making known and understood the effects of that power. This includes reporting on successes as well as failures.

Journalists have an obligation to protect this watchdog freedom by not demeaning it in frivolous use or exploiting it for commercial gain.

It must provide a forum for public criticism and compromise

The news media are common carriers of public discussion, and this responsibility forms a basis for special privileges that news and information providers receive from democratic societies.

These privileges can involve subsidies for distribution or research and development (lower postal rates for print, use of public spectrum by broadcasters, development and management of the Internet) to laws protecting content and free speech (copyright, libel, and shield laws).

These privileges, however, are not pre-ordained or perpetual. Rather, they are conferred because of the need for an abundant supply of information. They are predicated on the assumption that journalism – because of its principles and practices – will supply a steady stream of higher quality content that citizens *and* government will use to make better decisions.

Traditionally, this covenant has been between news organizations and government. The new forms of digital media, however, place a responsibility on everyone who “publishes” content – whether for profit or for personal satisfaction – in the public domain.

The raw material cast into the marketplace of ideas sustains civic dialogue and serves society best when it consists of verified information rather than just prejudice and supposition.

Journalism should also attempt to fairly represent varied viewpoints and interests in society and to place them in context rather than highlight only the conflicting fringes of debate. Accuracy and truthfulness also require that the public discussion not neglect points of common ground or instances where problems are not just identified but also solved.

Journalism, then, is more than providing an outlet for discussion or adding one’s voice to the conversation. Journalism carries with it a responsibility to improve the quality of debate by providing verified information and intellectual rigor. A forum without regard for facts fails to inform and degrades rather than improves the quality and effectiveness of citizen decision-making.

It must strive to keep the significant interesting and relevant

Journalism is storytelling with a purpose. It should do more than gather an audience or catalogue the important. It must balance what readers know they want with what they cannot anticipate but need.

Writing coaches Roy Peter Clark and Chip Scanlan describe effective newswriting as the intersection of civic clarity, the information citizens need to function, and literary grace, which is the reporter’s storytelling skill set. In other words, part of the journalist’s responsibility is providing information in such a way people will be inclined to listen. Journalists must thus strive to make the significant interesting and relevant.

Quality is measured both by how much a work engages its audience and enlightens it. This means journalists must continually ask what information has the most value to citizens and in what form people are most likely to assimilate it. While journalism should reach beyond such topics as government and public safety, journalism overwhelmed by trivia and false significance trivializes civic dialogue and ultimately public policy.

It must keep the news comprehensive and proportional

Journalism is our modern cartography. It creates a map for citizens to navigate society.

As with any map, its value depends on a completeness and proportionality in which the significant is given greater visibility than the trivial.

Keeping news in proportion is a cornerstone of truthfulness. Inflating events for sensation, neglecting others, stereotyping, or being disproportionately negative all make a less reliable map. The most comprehensive maps include all affected communities, not just those with attractive demographics. The most complete stories take into account diverse backgrounds and perspectives.

Though proportion and comprehensiveness are subjective, their ambiguity does not lessen their significance.

Its practitioners must be allowed to exercise their personal conscience

Doing journalism, whether as a professional writing for a news organization or as an online contributor in the public space, involves one's moral compass and demands a personal sense of ethics and responsibility.

Because "news" is important, those who provide news have a responsibility to voice their personal conscience out loud and allow others to do so as well. They must be willing to question their own work and to differ with the work of others if fairness and accuracy demand they do so.

News organizations do well to nurture this independence by encouraging individuals to speak their minds. Conversation and debate stimulate the intellectual diversity of minds and voices necessary to understand and accurately cover an increasingly diverse society. Having a diverse newsroom does little if those different voices are not spoken or heard.

It's also a matter of self-interest. Employees encouraged to raise their hands may "save the boss from himself" or protect the news organization's reputation by pointing out errors, flagging important omissions, questioning misguided assumptions, or even revealing wrongdoing.

Having a sense of ethics is perhaps most important for the individual journalist or online contributor.

Increasingly, those who produce "the news" work in isolation, whether from a newsroom cubicle, the scene of a story, or their home office. They may file directly to the public without the safety net of editing, a second set of eyes, or the collaboration of others. While crowdsourcing by the audience may catch and correct errors or misinformation, the reputation of the author and the quality of public dialogue are nevertheless damaged.

Citizens, too, have rights and responsibilities when it comes to the news

The average person now, more than ever, works like a journalist.

Writing a blog entry, commenting on a social media site, sending a tweet, or "liking" a picture or post, likely involves a shorthand version of the journalistic process. One comes across information, decides whether or not it's believable, assesses its strength and weaknesses, determines if it has value to others, decides what to ignore and what to pass on, chooses the best way to share it, and then hits the "send" button.

Though this process may take only a few moments, it's essentially what reporters do.

Two things, however, separate this journalistic-like process from an end product that is "journalism." The first is motive and intent. The purpose of journalism is to give people the information they need to make better decisions about their lives and society. The second difference is that journalism involves the conscious, systematic application of a discipline of verification to produce a "functional truth," as opposed to something that is merely

interesting or informative. Yet while the process is critical, it's the end product – the “story” – by which journalism is ultimately judged.

Today, when the world is awash in information and news is available any time everywhere, a new relationship is being formed between the suppliers of journalism and the people who consume it.

The new journalist is no longer a gatekeeper who decides what the public should and should not know. The individual is now his or her own circulation manager and editor. To be relevant, journalists must now verify information the consumer already has or is likely to find and then help them make sense of what it means and how they might use it.

Thus, write Kovach and Rosenstiel, “The first task of the new journalist/sense maker is to verify what information is reliable and then order it so people can grasp it efficiently.” A part of this new journalistic responsibility is “to provide citizens with the tools they need to extract knowledge for themselves from the undifferentiated flood of rumor, propaganda, gossip, fact, assertion, and allegation the communications system now produces.”

This guide, like many of the others in API's Journalism Essentials section, is largely based on the research and teachings of the Committee of Concerned Journalists — a consortium of reporters, editors, producers, publishers, owners and academics that for 10 years facilitated a discussion among thousands of journalists about what they did, how they did it, and why it was important. The author, Walter Dean, was CCJ training director, and API Executive Director Tom Rosenstiel formerly co-chaired the committee.





A peek behind the inewssource curtain on International Fact-Checking Day

by Brad Racino | April 2, 2018



April 2 marks International Fact-Checking Day, created and celebrated by the nonprofit Poynter Institute as “an answer to concerns about the reach and impact of online misinformation.” Poynter even created a website – factcheckingday.com – with tip sheets for media consumers, course material for high school and college students, an interactive quiz, and more.

In light of today’s celebration, we thought this a good opportunity to pull back the curtain and show readers how fact-checking plays into *inewssource’s* process in the months, weeks, days and hours before publishing an investigation.

How we choose our stories

Typically, *inewssource* stories come to reporters in one of three ways: Either as a tip from someone inside or outside the newsroom, as part of covering a beat (such as health care or local government), or as a good old-fashioned gut feeling.

Fact-checking starts in this process. Tips from the public can be wrong or misleading, and can take hours to days to verify or debunk. Gut instincts can be wrong, as well.

Yet if they are verified and the potential story fits our mission – to produce investigative content that holds powerful people or institutions accountable – reporters may then dig in.

The digging in stage

The “digging in” can take several weeks to many months. A reporter spends this time researching the topic, interviewing experts, submitting public record requests to local, state or federal agencies, gathering and analyzing relevant

We’ll let you know when big things happen.

Email address:

data from private or public sources, and using their colleagues and editors as sounding boards throughout.

Fact-checking is prevalent during all of this. For example, a local newspaper relied on as part of the research process may have a subject's name spelled wrong, or the wrong date, time, or location of an incident. To avoid repeating the mistake, *inewsourc*e reporters find a primary source of information to check against the first.

The same goes for public records. *inewsourc*e works often with primary documents from government agencies, but even the information in those documents can be wrong. We check elements in those documents with outside sources to verify it. Reporters are trained to gather these “facts” as they report. You’ll see why that’s essential when we get to the “excruciating” part below.

After the research, interviews and analyses, a reporter will begin writing. This can take days or weeks depending on the length and complexity of the story. During this process, *inewsourc*e editors work with reporters on grammar, style, clarity, fairness and context.

The excruciating part

After *inewsourc*e’s reporter and editor are finished (and happy) with the final result, there is still another day or more for a word-by-word fact check on the final draft.

To do this, the reporter is paired up with a colleague and the two sequester themselves in a room with a voluminous amount of coffee. Then, the reporter must prove to the colleague that each fact is true by producing the primary document behind it. Or if using a quote, the reporter must produce the audio clip from the taped interview. This method takes about three to four hours for a short (1,000 word) story. It can take days for longer, in-depth investigations and up to a week for stories that rely on complicated data analyses.

As an example, here’s the first paragraph from an *inewsourc*e **investigation into community college remedial classes**:

“Anthony Rodriguez recalled sitting in a remedial math class at Grossmont College in El Cajon bored out of his mind. The professor was teaching basic math skills that the 18-year-old had already learned in high school.”

Fact-checking this paragraph required the reporter prove her answers to the following questions:

- How do you know that’s Anthony’s name and how he spells it? (Must show driver’s license, government document or audio clip of him spelling his name)
- How do you know the class was a remedial math class? How do you know it was at Grossmont College? (Must find syllabus, interview the class teacher or

have other first-hand knowledge)

- How do you know that's how to spell Grossmont College? (Show the website and read the spelling out loud)
- How do you know the college is in El Cajon? (Show me a map or physical address on the Grossmont College website)
- How do you know Anthony was bored? (Show me where he said that in the interview)
- How do you know the professor was teaching basic math skills? (Show me the syllabus or the part of the interview where Anthony recalled the professor was teaching basic math)
- How do you know Anthony is 18? (Either show me a document with his birthday or the portion of the interview where Anthony mentions his age. Then, verify he hasn't turned 19 by calling him the day before publication)
- How do you know Anthony already learned basic math skills in high school? (Show me his high school transcript or similar proof he had completed basic math)

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As you can guess, this process is exhausting. And we're not done! When blowback is expected (typically with investigations into government or powerful people), *inewssource's* attorney examines the story within a legal framework and may recommend different word choices and contextual additions.

Transparifying

A few years back, we realized that we should do something with the trove of documents reporters accumulate during the fact-checking process that never see the light of day. We asked ourselves – why not make all our documentation public in a way that benefits readers and contributes to future research?



Click this button within any *inewssource* story that has it to see the documentation proving each sentence.

To do this, *inewssource* hired a developer to install a custom-made website tool. You can see it throughout almost all our major investigations as a red box near the top of the story that says, “Read this story completely backed up by primary documents – Click Here.”

If you click on the “Click Here” hyperlink, you’ll notice the text in the story changes from black to red. Those red words are now hyperlinks and if clicked on, will show you the document or similar proof behind that particular word or sentence.

This is how inewssource does transparency



As an example, take the following sentence from *inewssource's* [investigation into Gompers Preparatory Academy](#):

“Politicians, parents, philanthropists and news outlets in San Diego have praised the school’s cultural and academic transformation.”

If you “transparify” that story by clicking on the red box, the following words will become hyperlinks: “Politicians,” “parents,” “philanthropists,” “news outlets in San Diego” and “school’s cultural and academic transformation.” Clicking on any of those words will yield the document, news story or video that proves it.

While most online news sources insert hyperlinks in their stories, *inewssource* was the [first in the country](#) to achieve this level of transparency in 2013. Five years later and, as far as we know, we’re still the only newsroom that does it.

And that’s something worth celebrating on International Fact-Checking Day.



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PRESS CONFERENCE MATERIALS

Nathan Fletcher, a member of the California Air Resources Board and a San Diego County supervisor, holds a press conference to announce a new program that will improve air in Barrio Logan and National City and other communities along the water in the southern part of the county.

Good morning. My name is Nathan Fletcher, and I'm a proud member of the board of supervisors here in San Diego County. I also am a member of the California Air Resources Board. That's the state agency that watches out for you and the quality of the air you breathe.

Today, I'm delighted to announce a new program that will improve air in Barrio Logan and National City and other port communities along the water in the southern part of the county. I know you've had problems. The air here hasn't been so good over the years. But it's pretty good now and we're going to make it better.

I was once in the Assembly in state government. So I know how things get done. Residents should feel confident in their government. We are doing everything we can to make your lives better, to improve your quality of life. We have heard your concerns and we are taking them seriously. Have no fear. You can trust us.

This new program I'm announcing is called the Community Air Protection Program, a first-of-its-kind effort to improve air quality in local communities that face the worst impacts of air pollution. It came out of legislation, called Assembly Bill 617, [signed by former Governor Jerry Brown](#) in July 2017.

The California Air Resources Board, called CARB for short, will work with local residents, air districts and other partners to identify local air quality problems, develop solutions and track progress together. The state will send millions of dollars to 10 communities -- including those here locally -- that have for years breathed some of the most polluted air in California. We are answering your pleas for relief from risks for asthma and cancer.

I know there has been disagreement about what's causing the pollution along the ports in southern San Diego County. Community members and their advocates have pointed to the shipbuilding industry, freight operations, and other activities at the Port of San Diego. I also hear the businesses arguing that freeway pollution is the primary threat.

More than \$6 million in state money will be spent here -- last year and this year -- on air monitors and other testing that will get to the bottom of the problem. Once we can isolate the pollutants, we can figure out the sources and what can be done about them.

Above all, know we have your back. It's a new day and we have new resolve to clean up your air and make your communities destinations for tourists and other county visitors. This is a great opportunity for you to report this news and tell the world that San Diego County is a great place to vacation because the coast is clear and the air is great.

I'll now take a few questions.

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