

Online Course in Science Journalism

Created by the WFSJ and SciDev.Net



Lesson 1 - Planning and structuring your work

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1.1 Introduction

Science reporters, even experienced ones, tend to fall in love at first sight: A new tuberculosis drug — I have to write about this! Dark matter — what a thrilling mystery! One laptop per child — we need to discuss this!

But successful science writing is not only about finding exciting topics. Complex issues need to be at least partly understood and put into context, while the personalities of scientists may not make for the most straightforward interviews.

Science writing is just as much about the questions: How do I focus my work? How do I plan, sell and present a story? What is my reader/listener/viewer interested in?

At the end of this lesson, you will:

- have taken a new look at news outlets, audiences, and the **news angle** of journalistic stories,
- be more familiar with the concept of the **research sentence**, which can help you to structure your research as well as to write your story,
- have had a brief introduction to the concepts of narrative writing and the **storytelling sentence**.

1.2 Who are you?

Journalism is an important profession; it plays a vital role in society. So your work is just as important as that of a farmer, a politician, a doctor or a scientist.

But your work is also quite different, and so are your priorities.

Remember that you are a journalist, not a scientist. Bear in mind also that you are not a teacher, although you have to explain many things to your audience. Neither are you a literary writer, although you need to write in such a way that people will enjoy reading your stories.

Your job is to inform your audience in an effective and enjoyable way, put science news in perspective and to do "watchdog journalism," which involves analysing controversial issues. It does not matter whether you are freelance or permanent staff; or whether you are an editor-in-chief or a reporter — you are a professional journalist and you are delivering an important service to society.

1.3 Getting to know the news outlet

Even an excellent story is no good if it does not suit your news outlet. Many novice science journalists suggest topics to editors that are just not relevant to that publication or broadcast outlet. In most cases, one could have known that through careful scrutiny of what the outlet has already published or aired.

So find out what a particular news outlet has published so far on this or related topics. How do they deal with them? What angle do they take? Do they present topics just as news or also as debate?

You should also consider what type of article to write or what type of broadcast to present.

- If you simply wish to present news or put a story into context, a short news story is often the best format. If you have a longer story to tell that requires more information and background, a feature may be better. Or if yours is a subjective opinion, present it as a commentary piece.
- Radio and TV provide many different formats: interviews, reports with interview clips, documentaries.
- Online journalism provides the opportunity to tell a story using any combination of tools available on the internet, including text, images, audio, video, links, maps and interactive tools. A written interview can be combined with video or audio clips of scientists commenting on the interviewee, or a news story can contain a video animation explaining the scientific discovery you are writing about. An interactive map like Healthmap [<http://www.healthmap.org/en/>] utilizes feeds from the World Health Organization and others to provide the latest updates on diseases in the different regions of the world. See for example how the story **Why BA 009 rose from the ashes** [<http://www.newscientist.com/article/dn19647-caught-on-video-why-ba-009-rose-from-the-ashes.html>] uses video to illustrate a scientific principle discussed in the story, or how the story New polio vaccine more effective in reducing disease [<http://www.bbc.co.uk/news/health-11621842>] complements the text with an audio quote from the WHO.

To ensure that your outline fits the news outlet, find and read/watch/listen to a published story in your chosen format. Try to get familiar with as many formats as possible.

1.4 Working with an editor

Find out who the editor is. They are more likely to be enthusiastic if you know what their interests are and what they have previously published.

Once you have a clear story, "pitch" it to the editor. Explaining on the phone why it is relevant and topical and how you plan to approach it can be more effective than emailing. Offer a short outline, be open to suggestions, and make sure you agree how to proceed. If you decide to email before telephoning, take care with the composition (be clear and concise, and check carefully for spelling errors) — a little extra effort now could make all the difference.

If possible, establish a working relationship with your editor. Once you have started your research, stay in touch. Inform and involve the editor, especially if the story or your angle changes, but keep in mind that editors are always busy and prefer if reporters do not create extra work. Keep your communication to a minimum.

Two 'golden rules' are very important for editors. Let the editor know in time if you're not going to make the deadline. And make sure that you write to the agreed length. If you have extra information, consider this an opportunity to do a follow-up story.

Be prepared to revise your story after the editor has seen it. Editors have their own take on a story and some may want to actively shape your piece, perhaps requesting additional work. But make sure that the piece still conveys your message.

Of course, editors will vary from good and even excellent to bad. Working with different editors will teach you a lot. Do not be discouraged by revisions and discussions. These are standard editorial practice. Be attentive to the changes that a good editor makes — this is the best way to become a more skilled journalist yourself.

1.5 Knowing your audience

Who is the intended audience of a particular news outlet? Are they reading about science regularly? Or is this just one among many other topics? Are they only half-interested (as is often the case) and do they need to be convinced to follow your stories?

Try to avoid thinking that you are reporting for the scientists you have interviewed. They are not your main readers/listeners/viewers.

Explaining science is important, but it is not a journalist's only task. Journalists have to popularise science to capture the audience's interest. But science journalism is also about showing people where the limits of our knowledge are. It is about good journalistic research. It is about relating science to other parts of society and putting it into a broader perspective e.g. politics, economy, health. And it is about criticising scientists and other experts where necessary.

Try to imagine that you are the reader's friend or advocate, not his teacher. How can you inform, entertain or help him? Then decide which aspects of the topic you need to look into and which are less important.

Think about how deep you need to dig into the science and methods used. Often it's the implications that are important, though sometimes the science itself is extremely relevant. If you're not sure, read other publications on the same topic, ask your editor or colleagues, and never forget who your audience is.

EXAMPLE 1:

Click on the following link to see a news story that briefly explains a scientific method in order to place the news itself into context:

TB test detects even drug-resistant strains:

[<http://www.scidev.net/en/health/tuberculosis/news/tb-test-detects-even-drug-resistant-strains.html>]

EXAMPLE 2:

Click on the following link to see a news story that is about the use of new technology but does not explain in detail how it works. Instead the story discusses the potential applications of the technology — which are likely to be more interesting to the readers:

Contraceptive gel could offer alternative to pill:

[<http://www.guardian.co.uk/science/2010/oct/26/contraceptive-gel-alternative-pill-trials>]

1.6 Researching the topic

Take the time to plan your journalistic research carefully. Write down which people you need to talk to and in which order you would like to meet or call them.

Keep in mind that journalism means using more than one source. The rule in journalism is that one source is no source, so make sure you have a minimum of two sources.

Don't exaggerate the importance of a new finding in order to promote your news story. Try to put it into context.

Try to be as accurate as possible. Try to use clear language that everybody can understand. Make sure you get the facts right. Answer the questions: Who? What? When? Where? Why? How? And make sure you answer all the other questions your audience might ask. Make your work transparent. Let the audience know the source of your most important facts.

Keep in mind that interviewing the right people is just as important as interviewing several people. Make sure you get all sides of the story. Often, it is not enough to talk only to scientists. You might also want talk to NGO members, politicians, companies and the people or patients struggling with a particular problem. Cover as many people as possible. But also keep in mind that a journalist has to work efficiently. Do not waste your time on sources or aspects of the issue that do not enrich your story.

Try to judge the reputation of different science news sources. Check key information with different experts. If your news story covers a scientific publication, you should not only speak to the author(s) of the study but also unaffiliated experts in that field of science. Ask all the experts you talk to about the sources you are using. Don't hesitate to ask them about other experts and their field of expertise. That way you get a feeling for the issue you are dealing with. Judging the scientific quality of your sources is covered more extensively in chapter 2.

Try to develop hypotheses and question them. Be ready to change your plan of action as soon as this turns out to be necessary.

EXAMPLE:

Click on the following link to a news feature. It is an excellent example of how a reporter may cover many sides of a story.

Will GM mosquitoes end dengue and malaria?:

[<http://www.scidev.net/en/features/will-gm-mosquitoes-end-dengue-and-malaria--1.html>]

1.7 Where do you stand?

1.7.1 The journalist's camera

Every story needs a "news angle" or perspective. Even though you are reporting on science, there is no truly "objective" journalistic view. You may choose to highlight a trend or put a research finding into context, or comment on a scientific controversy. Or perhaps you would like to portray a person through the experience of spending a working day with him or her.

So remember, there are many ways to tell a story. **Choose your perspective carefully.**

Think of yourself as a journalist holding a camera — even if you are working for print, online or radio. The question is: where do you place your imaginary "camera"?

Your "camera" can be:

- close to a single person, e.g. a patient or a victim;
- high above a scene, reporting from a distance, independent and little involved;
- close to an organisation that offers information, such as an NGO or a company;
- close to the scientific community;
- close to the audience, examining problems in their daily life.
- ... and there are certainly other options.

Once you have installed your "camera," leave it where it is. Do not jump around without good reason. In other words, stick to a certain perspective all the while you create your report — that is, unless you are preparing a very long piece, in which case you may need to change your "camera" position. If so, make it clear to the reader when and why you are doing so.

EXAMPLE:

Imagine you would like to cover the construction of a new geothermal plant in western Africa. Your editor allows you to write a longer story. A short news piece may have had one of three possible "camera" perspectives, but these could be combined as the segments of a longer feature:

- a) The people who could profit from the renewable energy source.
- b) The engineers and the company who build the plant — their work and the financial risk involved with every hole drilled.
- c) Government officials and NGOs who support the geothermal plant construction. What is their vision for the energy supply in the future?

Click on the following link to a feature story that illustrates how this can be done:

Kenya looks underground for power

[<http://news.bbc.co.uk/1/hi/world/africa/4473111.stm>]

1.7.2 Working with the "research sentence"

To clarify your pitch for a story you may find it useful to write it as a single sentence. This can help you plan your research as well as structure your manuscript and find your style of writing.

The following has proven to be a very useful starting point:

"Having done my journalistic research I look at it this way: ..."

The idea is to complete this "research sentence" by speaking it aloud or writing it down.

EXAMPLES:

1. "Having done my journalistic research I look at it this way: Kenya works towards a better future by investing in geothermal energy sources."
2. "Having done my journalistic research I look at it this way: Geothermal plants can help to solve the energy problems in some world regions, but the financial risk involved in drilling is still a major obstacle."
3. "Having done my journalistic research I look at it this way: A flower farm that uses geothermal energy in Kenya is an example of a creative and successful use of this form of energy."

As in the above examples, the completion of the sentence must always include an angle or even a judgement. This does not mean you put down your personal opinion or a commentary. It should just help you to focus your journalistic research and choose the position of your "camera" well.

Using the research sentence helps you to:

- Clarify how you want to tell a story and decide which aspects and facts are important and which are not. You can even use this research sentence before starting your research.
- Know how each paragraph has to fit into the story. Every sentence you write should somehow follow the direction of the research sentence, or discuss one aspect of it.

But, of course, journalism is also about questioning your own assumptions. So be prepared to alter your research sentence during your research, if necessary. It may turn out to have been wrong, or you may discover a more interesting angle.

1.8 Structuring content

Before you start your report, take time to plan it. Write on a piece of paper what absolutely needs to be in the story and in which order. Find an introduction to seduce a half-interested reader. In most cases it is best to get directly to the point, as readers want to find out quickly what the news is and where the article is heading.

A well-written story does not just add many loosely connected facts but follows a certain "red thread". It should be obvious to the reader why one paragraph follows the next. After you start writing you might want to change the article's initial structure. Nevertheless, you will benefit from having started with an initial plan. It is also useful to have an early plan for how an article might end.

A good science reporter avoids drowning the reader in information. Science journalists should not attempt to display everything they know — but make a good choice about what to finally present to the audience. While planning and writing, try to divide up the more demanding parts of a story so that there are relatively easy and entertaining paragraphs in between. Remember also the word limit you agreed on with your editor.

Be aware that science writing is a matter of careful choices. The topics you deal with are complex. So you need to decide which aspects to define in simple language, or explain in detail. Just as important: which are the elements to only touch upon briefly? What aspects should you leave out entirely? The more clearly you define your news angle, "camera" perspective, or research sentence, the easier it will be to take these decisions.

Remember that news stories and feature articles have a different structure. News articles are structured as an inverted pyramid, with the most important news at the beginning and supporting information following in order of diminishing importance. Many readers will stop reading news stories partway through, and you want to get the most important information to them before that happens. A feature article, however, is a complete story with a beginning, middle and ending. See chapter 4 for more information.

1.9 Narrative writing

Starting your article with a short story about a person or people can capture the reader's attention, especially if the article is a feature. But this only works if it leads directly to the centre of your reporting theme. If the short story is really engaging, you may even wish to extend it over the whole article.

EXAMPLE: Click on the following link and look at the first few paragraphs and the last in this story. It begins with a very simple story that gets the reader to the main point:

Arsenic: when will the clean water start flowing?:

[<http://www.scidev.net/en/features/arsenic-when-will-the-clean-water-start-flowing--1.html>]

"Narrative writing" follows the classical rules of drama. It requires a main character and either an opponent or a difficulty that he or she encounters. In the end you have to tell if and how the conflict is resolved, or the difficulty overcome. Your "camera" will focus on this character and the audience will want to know what happens. (This method works especially well on TV and radio, too.) All the general facts and scientific details in this story would be included in the general dramaturgy.

So it helps to complete the following "storytelling sentence": Today I am going to tell you the story about my main character named:...

He or she encounters the following difficulty/challenge/conflict:...

In the end the difficulty/challenge/conflict is resolved/overcome — or nothing has changed.

For example, instead of just stating the latest facts on influenza vaccines, a writer might choose to work with the sentence:

"Today I am going to tell you the story about Jo Smith, a scientist who tries to find new vaccines for influenza viruses. But it will turn out that she has to fight this battle every year."

1.10 Self-teaching questions (1-3)

The following 8 questions should help you to revise the points of the Lesson One e-lecture. Some possible answers are on the next page. Try not to look at them before you have actually written down the answers on a piece of paper.

Please take a look at the following website: [<http://www.scidev.net/en/science-communication/practical-guides/>] Find out which criteria a news story has to meet if you want to publish it on SciDev.Net. Then try to answer the following first three questions:

QUESTION 1:

How many paragraphs should the reader of a SciDev.Net article read before he or she understands what the article's main thrust is?

- a) 1 paragraph
- b) 3 paragraphs
- c) 5 paragraphs

QUESTION 2:

Imagine you have started writing your first news story for SciDev.Net but realize you have reached 600 words before finishing. What do you do?

- a) Reduce it to 500 words.
- b) Ask the editor for permission to write 650 words.
- c) Write 1200 words, send it to the editor, and explain why this has become a feature story.

QUESTION 3:

Which of the following three subjects is most likely to be accepted by SciDev.Net?

- a) **"Safe Alternative" Treatment for Malaria in Pregnancy**
Trials carried out in Ghana show that treating pregnant women with the drug amodiaquine, either alone or in combination with sulphadoxine-pyrimethamine (SP), almost completely wipes out malaria parasites without causing any serious side effects.
- b) **Warning of Locust Strike in West and North Africa**
The UN has warned West and North Africa to be on the alert for a possible plague of locusts that could have a potentially devastating impact on the region's crops. During the summer of 2004, an outbreak of locusts devastated crops, fruit trees, and vegetation in several parts of West Africa, at a cost of more than US\$400 million.
- c) **Tunisia unveils plans to boost scientific development**
Tunisia has announced three initiatives to boost the contribution of science and technology to national development. Part of its role will be to provide policymakers with information about research trends of potential socioeconomic importance.

1.11 Self-teaching questions (1-3) answers

QUESTION 1:

How many paragraphs should the reader of a SciDev.Net article read before he or she understands what the article's main thrust is?

Answer:

a. 1 paragraph

QUESTION 2:

Imagine you have started writing your first news story for SciDev.Net but realize you have reached 600 words before finishing. What do you do?

Answer:

a. Reduce it to 500 words

QUESTION 3:

Which of the following three subjects is most likely to be accepted by SciDev.Net?

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Trials carried out in Ghana show that treating pregnant women with the drug amodiaquine, either alone or in combination with sulphadoxine-pyrimethamine (SP), almost completely wipes out malaria parasites without causing any serious side effects.
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- c) **Tunisia unveils plans to boost scientific development**
Tunisia has announced three initiatives to boost the contribution of science and technology to national development. Part of its role will be to provide policymakers with information about research trends of potential socioeconomic importance.

Answer:

All three (a, b and c) are good: All three news pieces appeared at SciDev.Net. This exercise was just to make you think about the criteria.

1.12 Self-teaching questions (4-6)

QUESTION 4:

Click on the following link to a news story: What is its research sentence?

Biodiversity loss seen as greater financial risk than terrorism, says UN

[<http://www.guardian.co.uk/environment/2010/oct/27/biodiversity-loss-terrorism>]

QUESTION 5:

Look at this feature story: What is its research sentence?

Miscarriages: How to Survive the Nightmare

[http://www.islamonline.net/servlet/Satellite?c=Article_C&cid=1159951553865&pagename=Zone-English-HealthScience%2FHSELayout]

QUESTION 6:

Imagine that you have been asked to do a report on search-engines such as Google [<http://www.google.com>] or Yahoo! [<http://www.yahoo.com>]. Come up with at least two possible research sentences.

1.13 Self-teaching questions (4-6) answers

You may have phrased your answers a little bit differently, but here are some suggested answers.

QUESTION 4:

Click on the following link to a news story: What is its research sentence?

Biodiversity loss seen as greater financial risk than terrorism, says UN

[<http://www.guardian.co.uk/environment/2010/oct/27/biodiversity-loss-terrorism>]

Answer:

Having done my journalistic research I look at it this way: Loss of ecosystems perceived by banks and insurance companies to be a greater economic risk than terrorism, finds UN report. In news stories, the lead of the story is often the research sentence since it contains the most important news.

QUESTION 5:

Look at this feature story: What is its research sentence?

Miscarriages: How to Survive the Nightmare

[http://www.islamonline.net/servlet/Satellite?c=Article_C&cid=1159951553865&pagename=Zone-English-HealthScience%2FHSELayout]

Answer:

Having done my journalistic research I look at it this way: Women who have miscarriages have the right to grieve in their own way and they need the right support.

QUESTION 6:

Find at least two research sentences for a report on search-engines such as Google [<http://www.google.com>] or Yahoo!

[<http://www.yahoo.com>].

Answers:

Possible research sentences could be (but there are surely many others)

- i) Having done my journalistic research I look at it this way: There are only a few main players left in the global market for search engines.
- ii) Having done my journalistic research I look at it this way: Most people use only one search engine and very simple search requests, although experts would advise the use of several search engines and advanced search options.
- iii) Having done my journalistic research I look at it this way: Google supports the regime in China by obeying the country's rules and self-censoring searches.

1.14 Assignments (1-2)

ASSIGNMENT 1: Knowing the audience

This assignment is related to the Lesson One e-lecture. It is homework that you can do yourself and then send to a tutor, mentor or other mentees to discuss with them.

- a) Most SciDev.Net stories have an international perspective or viewpoint. Pick any story from the SciDev.Net website that relates to the country you live in. Try to rewrite it so that it appeals to the readers of a local newspaper as a news piece of not more than 200 words.
- b) Who else would you contact or interview for the story, close to where you live?
- c) Imagine that you have started a children's corner in your newspaper. Find a science story on the web (not necessarily from SciDev.Net) suitable as a news for children aged 11-16. Rewrite it for this audience in 100 words.

ASSIGNMENT 2: Research sentence

This assignment is related to the Lesson One e-lecture. It is homework that you can do yourself and then discuss with a tutor, mentor or other mentees.

- a) Choose a story you have written in the past. Can you choose the appropriate research sentence or storytelling sentence? Now think of alternatives — different research sentences or storytelling sentences that might also have worked?
- b) Choose a familiar news outlet. Find something they have reported a few years ago. What was the research sentence? How could you write a new story on the old topic? Develop a new research sentence or a storytelling sentence.

1.15 Assignment (3): Dealing with invisibility

This assignment is related to the Lesson One e-lecture. It is homework that you can do yourself and then discuss with a tutor, mentor or other mentees.

Take a look at this news-story (published by the "Sun," a British tabloid) (Here is some first aid on the vocabulary: A "boffin" is a scientist; an "invisibility cloak" is a coat that makes you invisible, if you wear it.)

Boffin invents invisibility cloak (The Sun, October 19, 2006)

AN INVISIBILITY "cloak" has been built by a British boffin. The device can steer microwaves around it to make objects undetectable by radar. Experts are confident it can be developed to do the same with light rays — making things invisible to the naked eye, just like boy wizard Harry Potter's cloak. A team led by Professor Sir John Pendry constructed the prototype at Duke University in North Carolina. It is made of ten fibreglass rings covered in wave-deflecting copper. Describing how it works, his colleague Professor David R Smith said: "All electromagnetic waves are swept around the area . . . to emerge on the other side as if they'd passed through an empty volume of space." Prof Pendry, of Imperial College London, unveiled the blueprint earlier this year. It has been part-funded by the US defence department.

This is a classical news story. It has the most important information at the beginning and answers all the journalistic questions: Who? What? When? Where? Why? How? Its language is simple and clear. But still there is something wrong with it.

IMPORTANT: Please don't try to become an expert in the physics of this research! You don't need to understand everything in detail here. Just try to understand roughly the main ideas, and estimate their journalistic relevance.

QUESTION 1:

Try to find out what is wrong with the article.

You can find the answer by looking at the following material:

original press release by EurekAlert

[<http://www.wfsj.org/course/en/L1/micro.html>]

Original paper in the journal "Science"

[http://www.wfsj.org/course/docs/Cloack_Schurig-10-20-06.pdf]

and a related news story in the same magazine.

[http://www.wfsj.org/course/docs/cloack_cho.pdf]

Here is also a good story on this written by the BBC

[<http://news.bbc.co.uk/2/hi/science/nature/6064620.stm>]

QUESTION 2: What was the research sentence of the article in "The Sun"?

QUESTION 3: What could be a better one?

QUESTION 4: Can you think of a storytelling sentence to cover this topic?

1.16 Answers (Assignment 3) and Assignment (4)

QUESTION 1:

Try to find out what it wrong with the article.

You can find the answer by looking at the following material:

original press release by EurekAlert

[<http://www.wfsj.org/course/en/L1/micro.html>]

Original paper in the journal "Science"

[http://www.wfsj.org/course/docs/Cloack_Schurig-10-20-06.pdf]

and a related news story in the same magazine.

[http://www.wfsj.org/course/docs/cloack_cho.pdf]

Here is also a good story on this written by the BBC

[<http://news.bbc.co.uk/2/hi/science/nature/6064620.stm>]

Answer:

The article gets several things completely wrong:

- It was not John Pendry who created the cloak but his American colleagues – Pendry just developed the mathematical theory to it.
- The objects hidden by the cloak are not invisible to radar.
- In fact, the cloak does not really work well at all. It works for a limited band of microwave-frequencies only which is like a specific colour in the visible spectrum. And it only works in 2 dimensions. Even then only some of the rays are guided around the cloaked object. So all it does is prove that Pendry's mathematical methods are correct and that it is useful for future research projects.
- It is not at all easy to extend this cloaking method to the visible spectrum.
- Even if this cloak does not completely hide things the technology may one day still be useful for the military. They are funding this research.

QUESTION 2:

What was the research sentence of the article in "The Sun"?

Answer:

Having done my journalistic research I look at it this way: A British scientist has managed to build a cloak that can hide things from microwaves and radar.

QUESTION 3:

What could be a better one?

Answer:

Having done my journalistic research I look at it this way: American and British scientists have developed a cloaking device that is rather imperfect but with it they have managed to show a proof of principle.

QUESTION 4:

Can you think of a storytelling sentence to cover this topic?

Answer:

Here are two possible ideas:

i) Today I am going to tell you the story of the physicists who are unable to use magic for making things invisible and who need to obey to the rules of nature. They have a new idea on how to achieve this, but they encounter many difficulties. In the end they produce something very modest.

ii) Today I am going to tell you the story of a fictitious character: a secret service agent who has heard about cloaking — a new defence technology. He starts to investigate, is astonished at what he reads in the tabloid newspaper, observes the scientist, and then realises that his government will have to monitor watch this technology. (This idea will probably work only on TV or radio – and it really demands setting up drama scenes, as in a play. But it would certainly be a creative way of reporting on the science of cloaking.)

Now that you have accomplished these questions, try to do the following assignment and discuss it with your mentor.

ASSIGNMENT 4:

Now try to rewrite the Sun's-story in 140 (!) words (the same length as the original story.) It's okay if some of the sentences remain

the same. Keep in mind that in this very limited space you cannot explain much. Decide which aspects you have to leave out. Try to keep the story interesting without making any inaccuracies.