

WRITING SCIENCE IN PLAIN ENGLISH - COURSE OUTLINE

This course will explore *Writing Science in Plain English*. At VOA Learning English, we regularly simplify science and technology stories from other news organizations for learners of English. We use a 1500-word basic vocabulary guide, which is available online at <http://docs.voanews.eu/en-US-LEARN/2014/02/15/7f8de955-596b-437c-ba40-a68ed754c348.pdf>

Based on our experiences, we believe that writing about science online should be:

- **Brief - Gets to the point:** think of how long you'd want to read a text on your phones or mobile devices.
- **Clear:** avoid jargon, local expressions, and long or complex sentences
- **Accurate:** Remember that it's easy for any reader online to check your facts and sources instantly.
- **Visual:** Paint a picture. Take the audience there. One example: to describe gravitational waves-- write about a rock hitting a pond, with ripples moving outward from where the rock hit the surface.
- **On Level:** aim at the general public - assume a 10th grade education

This session we will focus on writing **factual** science articles. That means you will **not** be writing about your opinions. We will look at these elements of writing about science in this session:

1. Structure of science writing
2. The language of science writing
3. The process of science writing

Part One: Structure of writing

Science writing is similar to journalism, academic writing, and other forms of writing. In journalism an article has three main parts:

Lede/Lead, also know as thesis in academic writing:

Basic facts: "Five Ws" of journalism: Who, What, When, Where, and Why and a sixth one: How as needed.

Use an anecdote, a small story that readers can relate to.

Supporting paragraphs

Additional details

Quotes from sources

Statistics

Background information

Conclusion or Ending

What is the one point do you want readers to remember?
Sometimes a summary of the main point of the story appears here.

An example from a VOA LE article:

Amazing Amazon Hides Atlantic's Coral Reef

<http://m.learningenglish.voanews.com/a/amazing-amazon-hides-coral-reef/3314107.html>

Lede:

Scientists studying the area where the Amazon River meets the Atlantic Ocean were in for a surprise. Under the muddy, dark Amazon River water was a large number of undiscovered reefs with colorful sea fans, coral plants, fish and very big sponges. It was one of the biggest surprises in modern ocean science. Most ocean reefs need sunlight to exist.

Who: Scientists

Where: Mouth of the Amazon River

What: Newly discovered reefs

Why: Reef grows without sunlight

Supporting paragraphs:

Details:

On their boat that day in 2012, [answers "When?"] they carried a hand-drawn map that suggested maybe a large set of reefs sat just below them. Brazilian scientist Rodrigo Moura of the Federal University of Rio de Janeiro, brought the map. He had read about the possible reefs in a 1977 research paper.

Quotes:

Yager says she was surprised to find coral reefs below the dark muddy water.

"You can't look down and see them like other reefs, they're quite deep. And then on top of that, the water, the surface layer of the water is very dark and turbid, so yeah, you can't see them from the surface, that's why we didn't know they were there."

Conclusion

But the Amazon reefs face their own threats. Companies want to drill for oil near the reefs. If they go forward, Yager warns, those large-scale operations could damage the reefs.

It's a good technique to leave the readers/listeners with something at the end to think about.

Part Two: Language of Science Writing

Use the active voice where possible

Active voice: *But the Amazon reefs face their own threats. Companies want to drill for oil near the reefs. (VOA Learning English version)*

Passive Voice:

Along with the discovery of the reef, researchers also found evidence suggesting this Amazonian jewel may already be threatened. "From ocean acidification and ocean warming to plans for offshore oil exploration right on top of these new discoveries, the whole system is at risk from human impacts," Yager said.

(From a CNN report on the same topic)

Passive sentences often sound boring and may leave out information. Writers use the passive voice when it is not clear who did an action: *The fish was caught this morning.*

Use simple sentence structure

CNN News version: *A recent report from [ARC Centre of Excellence for Coral Reef Studies](#) showed that 90% of the Great Barrier Reef off the coast of Australia is suffering from coral bleaching, which is caused by changes in ocean conditions such as temperature, light or nutrition.*

VOA Learning English original version: *News about the reef comes when there is more bad news about the problems of coral bleaching in Australia's Great Barrier Reef. Scientists warn the bleaching is due to warming waters, and it is very damaging to the coral.*

Use visual images

We have talked about the Amazon Reef story.

Here are some extra details I added to create a visual picture for the reader:

On their boat that day in 2012, they carried a hand-drawn map that suggested maybe a large set of reefs sat just below them....He lowered a dredging machine into the muddy water. Oceanographer Patricia Yager was there too. With others, she leaned over the boat's edge, waiting to see what Moura would bring up from the bottom. They did not expect much.

The team was studying the area where the Amazon River flows into the Atlantic Ocean. Where these waters meet, the world's largest river moves out across the top of the ocean, spreading out like a fan.

I used words "dark and muddy water" throughout the story.

Here are some visual images I used in another story, one about gravitational waves. What are gravitational waves? It turns out they are something the brilliant scientist Albert Einstein thought existed, but had not proved. My job was first to understand what they are, and then find the best way to explain them. I created a picture –a visual-- for our audience:

Gravitational Waves Detected, Einstein Is Right

<http://learningenglish.voanews.com/a/eistein-is-proven-right/3188629.html>

The idea was that the waves are like ripples in space, caused by some of the violent and energetic processes in the Universe. For example, two black holes crashing into each other.

What are these gravitational waves? Well, imagine throwing a rock into a pond. When the rock hits the flat surface of the water, it creates ripples or waves. Spacetime is like the surface of the water. So that means gravitational waves are like the ripples moving out from where the rock hits the water.

Keep paragraphs short

Each paragraph should have one idea. Write one or two sentences per paragraph.

VOA Learning English version:

She says in the areas that get less light, the living creatures are less dependent on photosynthesis.

News release: <http://news.uga.edu/releases/article/new-reef-system-at-mouth-of-amazon-river-0416/>

"The paper is not just about the reef itself, but about how the reef community changes as you travel north along the shelf break, in response to how much light it gets seasonally by the movement of the plume," said Yager, who spent two months in Brazil as a Science Without Borders visiting professor.

"In the far south, it gets more light exposure, so many of the animals are more typical reef corals and things that photosynthesize for food. But as you move north, many of those become less abundant, and the reef transitions to sponges and other reef builders that are likely growing on the food that the river plume delivers. So the two systems are intricately linked."

Eliminate unnecessary words

Go back after writing and see if you can make your sentence shorter by getting rid of extra words.

Example: VOA Learning English

The reefs run from the French Guiana border to Brazil's Maranhao state, covering about 9,500 square kilometers.

Original Science magazine report:

<http://advances.sciencemag.org/content/advances/2/4/e1501252.full>

An extensive carbonate reef system of ~9500 km², spanning from 5°N to 1°S and 44° to 51°W, was recorded between the Brazil–French Guiana border and Maranhão State, Brazil (Fig. 1). Rhodolith beds and higher-relief structures were recorded across a relatively long (~1000 km) and narrow (~50 km) stretch in the outer shelf and upper slope, in depths ranging from 30 m to the shelf break at 90 to 120 m. This extensive submerged carbonate system extends from French Guiana southward to the Manuel Luis reef, the northernmost emerging reef within the Brazilian Biogeographic Province.

Part Three: Sources for Science Stories**Evaluating Resources**

When deciding what story to write about, the first thing to decide is if it a credible story. Go beyond the headline. Sometimes they are written to draw people in, but the actual study might not be as important as it sounds in that first sentence.

Some questions to consider:

- Is it about a new study?
- Look at the source—who did the study? Is it a credible institution or university?
- How large was the study? Who did it?
- Credibility counts—by whom and how the study was conducted is important. A large study by Harvard University carries more importance than a small study, on less people, by a lesser-known organization.
- Always use more than one source on a science story. Don't just take your information from one article.

Interviews - get scientists to talk in plain English

Scientists are paid paid to speak in complicated sentences. The more long words they write, the more important they sound. Your job is to reverse that process and get them to speak in English that readers and listeners can understand.

Start by telling the scientist who the audience is that you are writing for—a non-science group. Ask them to speak in plain English.

This kind of question or prompt helps remind the scientist to speak simply in a way people understand:

- "What does it (or that) mean?"
- "Tell me about that."
- "For someone listening at home..."
- "For the average person.."

- "Can you boil it down?"

Important – don't be afraid to say "I don't get this, can you explain it to me?"
Before you can write it clearly you must understand it clearly.

Part Four: Process Writing

The first draft you write is the beginning of a *process*. That process involves sharing your work with a peer, getting feedback, and revising it. For our purposes, we recommend that you form a group to help each other with this process and use the checklist to evaluate your peers. This will help you improve your writing skills at the same time you help and learn from others.

Use this checklist for evaluating writing

- Lead paragraph gives basic information
- Supporting paragraphs provide details, quotes, numbers, or background
- Sources are properly attributed - and are reputable
- Conclusion makes writer's point clearly or summarizes the story
- Language is simple and direct

How to form and conduct a peer support group

Choose people...

- In your school, you can meet with peers in person or over email

Agree on deadlines

- Deadline 1: Send your article to the group (*Example: Send by Sunday night (date)*)
- Deadline 2: Respond to another group member's article - using the checklist (*Example: Respond by the following Saturday afternoon*)

Send your writing to the group

- Decide: will everyone read every group member's writing or will one person read one person's writing?

Respond to the writing

- Use the checklist
- Give positive feedback - say what is good
- Suggest a change by using highlighting and track changes in Word or inserting comments.

Revise

- Use Word's track changes to show what you have changed or provide the original on one page along with the revised version on another page.
- Read your revised work aloud to see how it sounds

Send for another edit

- Return your writing to your group for a second edit, if time allows.

Submit article for the contest

- Revise and submit to VOA for contest
 - If your group agrees, choose the *best* one or two articles from your group to send to VOA for the contest
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Contest rules:

- Deadline: June 30
- Participants submit a nonfiction science article of 1000 words or less
- Sources of information are included with the article (these do not count in the word limit)
- Article is in electronic format and has been edited by a peer (include the peer's name) and grammar and spell-checked

Awards:

- A certificate of recognition to come from the U.S. Embassy in Nairobi
- Publication of selected entries on VOA Learning English website

Possible writing topics for the contest

A scientific breakthrough that is especially relevant to Kenyans

Student science research or inquiry

An everyday problem explained by a scientist

A new way of looking at solving a problem in Kenya

A science teacher who inspires or guides student research

Sources:

Journalism and Journalistic Writing

<https://owl.english.purdue.edu/owl/resource/735/01/>

<https://owl.english.purdue.edu/owl/owlprint/735/> (Printable)

“The Associated Press Statement of News Values and Principles.”

<http://www.ap.org/company/news-values>

VOA Learning English articles:

Gravitational Waves Detected, Einstein Is Right

<http://learningenglish.voanews.com/a/eistein-is-proven-right/3188629.html>

Scientist Fights for Coral Reefs, Makes Science Fun

<http://learningenglish.voanews.com/content/marine-biologist-fight-for-coral-reefs-makes-science-fun/3232146.html>

Study: Plants May Help Women Live Longer

<http://learningenglish.voanews.com/content/plants-help-women-live-longer/3311928.html>

Gravitational Waves Detected, Einstein Is Right

<http://learningenglish.voanews.com/a/eistein-is-proven-right/3188629.html>

SCIENCE IN THE NEWS

Amazing Amazon Hides Atlantic's Coral Reef

Scientists studying the area where the Amazon River meets the Atlantic Ocean were in for a surprise.

Under the muddy, dark Amazon River water was a large number of undiscovered reefs with colorful sea fans, coral, plants, fish and very big sponges. It was one of the biggest surprises in modern ocean science.



Scientific crew of RV Atlantis that found the ocean reef off Brazil's coast. July 2012 (Credit Jason Landrum).

Most ocean reefs need sunlight to exist.

On their boat that day in 2012, they carried a hand-drawn map that suggested maybe a large set of reefs sat just below them.

Brazilian scientist Rodrigo Moura of the Federal University of Rio de Janeiro, brought the map. He had read about the possible reefs in a 1977 research paper.

He lowered a dredging machine into the muddy water. Oceanographer Patricia Yager was there too. With others, she leaned over the boat's edge, waiting to see what Moura would

bring up from the bottom. they did not expect much.

"But we were very excited about the possibility, and of course he brings up the most amazing animals I have ever seen, at least in this part of the world. They were colorful, coral, sponges, fish, brittle stars, all kinds of things I could not have imagined in my wildest dreams, lived underneath this river plume."

The team was studying the area where the Amazon River flows into the Atlantic Ocean. Where these waters meet, the world's largest river moves out across the top of the ocean, spreading out like a fan.

Yager teaches oceanography at the University of Georgia in the U.S. She explains that the water from the river stays separate from the ocean as it moves across it, covering the ocean with its dark and muddy water.

The reefs sit hidden in the ocean, about 50 meters below the surface of the water, says Yager.

“And so it is not being bathed in the river plume itself. It’s far below, in the very salty ocean, so the fresh water is not touching the reefs, they’re in salty ocean water.”

The reefs run from the French Guiana border to Brazil’s Maranhao state, covering about 9,500 square kilometers.

Yager says she was surprised to find coral reefs below the dark muddy water.

“You can’t look down and see them like other reefs, they’re quite deep. And then on top of that, the water, the surface layer of the water is very dark and turbid, so yeah, you can’t see them from the surface, that’s why we didn’t know they were there.”

She says that she was taught that coral needs sunlight to survive. And yet, here were coral in the lowlight of this area and they were just fine.

Some of the reefs do get sunlight for part of the year.

She says in the areas that get less light, the living creatures are less dependent on photosynthesis.

Some of the coral reefs stand 30 meters high.

They are home to lobster, red snapper fish and very big sponges. But the area does not have as many different kinds of animals as some of the other well-known reefs around the world, like Australia’s Great Barrier Reef.

On their trip in 2012, the team only had a short time to find and explore their surprising discovery. The Brazilian scientists went back to the reefs in 2014 to do more studies of the reefs.

Recently they published their findings in the journal *Science*.

Yager says they plan to keep studying the area. One day, they would like to use they would like to use submersibles—vehicles used under water, to explore the reefs.

“It would be really nice to not have to dredge this system to understand it, because of course that is a very destructive method. I would rather go down with cameras and look at it instead of destroying it.”

She says discovering these reefs is an example of how little is known about the oceans, and how important exploration is.

“We need to be open to discoveries,” she says.



The Amazon River plume where it meets the Atlantic Ocean off Brazil's coast. River water is green. Credit NASA



A coral found in the Atlantic Ocean reef, where it meets the Amazon River Plume. 2012 (Credit

News about the reef comes when there is more bad news about the problems of coral bleaching in Australia's Great Barrier Reef. Scientists warn the bleaching is due to warming waters, and it is very damaging to the coral.

Yager says it might help to study how these Amazon reefs survive with less sunlight.

Maybe, she says, scientists can

find ways to help the other reefs suffering around the world.

But the Amazon reefs face their own threats. Companies want to drill for oil near the reefs. If they go forward, Yager warns, those large-scale operations could damage the reefs.

I'm Anne Ball.

Anne Ball wrote this story. Hai Do was the editor.

We want to hear from you. Write to us in the Comments Section and visit us on Facebook.

Words in This Story

reef – *n.* a group of rocks or coral or sand ridge at or near the surface of water

coral – *n.* a hard material formed on the bottom of the sea by the skeletons of small creatures

dredging – *v.* the act of removing mud from the bottom a river (or lake, etc) in order to search for something

oceanographer – *n.* a person who studies oceans

plume – *n.* the area where the river meets the Atlantic Ocean and fans out on top of the ocean water

photosynthesis – *n.* the process where plants turn water and carbon dioxide into food when the plant is exposed to light

destructive – *adj.* something that causes a very large amount of damage

bleaching – *n.* the harmful process when coral losing their color—turning white— due to stress, because of warming waters