

Clear and Accessible Writing for Public Engagement

Tuesday 25 April 2023
University of Brighton

PAMELA
AGAR / PROJECTS

Goals for today

- Consider who you are writing for and why
- Understand how people read, particularly online, and what this means in terms of how you approach writing
- Learn the fundamentals of writing clear and accessible content
- Explore tools and resources that can help you
- Have reviewed, edited and improved your own writing
- Have edited a colleague's work and offered feedback and constructive suggestions.

How we'll run today's session



PRESENTATION AND DISCUSSION

A balance of both



SHARING SLIDES

Slides and resources shared online



ASK QUESTIONS

Don't hesitate – let me know!

<https://www.pamelaagar.com/writing-course>
Password: Brighton



Introductions

About me – Pamela Agar

Head of Digital and Creative *Imperial College London*

2 x institutional website redesigns
Revamped news channel
Student blogging
Web, social, video, brand,
editorial strategy

Digital Project Manager *The Francis Crick Institute*

Digital transformation
projects

Co-Executive Director *CASE Europe*

Professional development,
awards, thought leadership in
education advancement

Managing Director *Pickle Jar Communications*

Students' Union UCL
St George's, University of
London
University of Stirling
University of York
SOAS

Director, *Pamela Agar Projects Ltd*

St George's, University of London
St Paul's Cathedral
University of Aberdeen
Guildhall School of Music &
Drama
UK Dementia Research Institute
Imperial College London
SCDTP

About you

- Your name
- Your work in a sentence...

[https://www.menti.com/
8483 3610](https://www.menti.com/84833610)



Writing for public
engagement – some
inspiration and ideas

What kind of writing are we talking about?

- **Long form** – blog posts, web pages, opinion pieces, creative writing
- **Short form** - social media, photo captions
- **Physical** – exhibitions, posters, print

Why are you writing?

To **INFORM**

To **ENTERTAIN**

To **INTERACT**

To INFORM

British Heart Foundation

How your heart works

The human heart works like a pump sending blood around your body to keep you alive.

It's a muscle, about the size of your fist, in the middle of your chest tilted slightly to the left.

Related links

[How your heart works](#)

[Your heart rate](#)

[How to restart a heart](#)

What is the function of the human heart?

Each day, your heart beats around 100,000 times. This continuously pumps about five litres (eight pints) of blood around your body through a network of blood vessels called your circulatory system. This blood delivers oxygen and nutrients to all parts of your body to help your organs and muscles work properly. Your blood also carries away unwanted carbon dioxide and waste products.

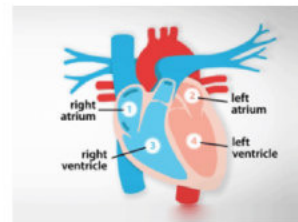
What is the structure of the human heart?

Your heart has a left side and a right side, they are separated by a thin muscular wall called the Septum. Both sides of your heart have an upper chamber and a lower chamber.

- the upper chambers are called the **left atrium** and the **right atrium** (or the atria)
- the lower chambers are called the **left ventricle** and the **right ventricle**.

The right side of your heart receives the de-oxygenated blood that has just travelled round your body. It pumps the blood to your lungs to collect a fresh supply of oxygen. The left side of your heart pumps the re-oxygenated blood round your body again.

Your heart muscle is made up of three layers of tissue:



<https://www.bhf.org.uk/information-support/how-a-healthy-heart-works>

The State of the UK's Butterflies 2022

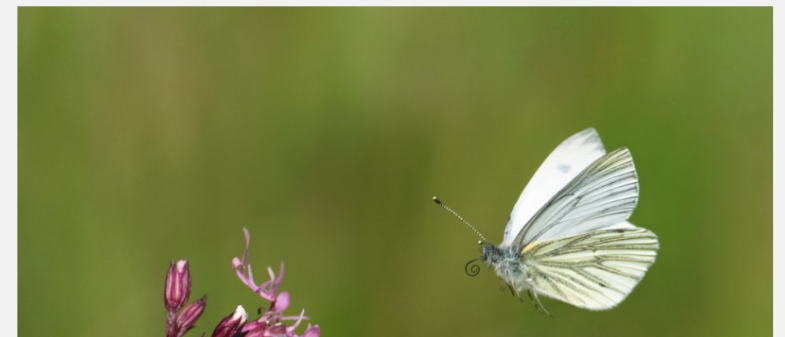
03 Feb 2023

A newly-released report on the UK's butterflies has revealed that 80% of butterfly species in the UK have declined since the 1970s, and half of our remaining butterfly species are at risk of extinction from Britain.

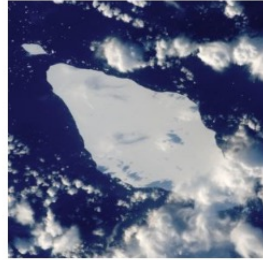
[The State of the UK's Butterflies 2022](#) is based on nearly 23 million records of butterfly sightings, most of which are submitted by citizen scientist surveyors. The report is produced by Butterfly Conservation, the UK Centre for Ecology & Hydrology and BTO.

Many BTO volunteers have contributed to the report by collecting data about butterflies on their BTO/JNCC/RSPB Breeding Bird Survey sites, as part of the UK Butterfly Monitoring Scheme's [Wider Countryside Butterfly Survey](#).

The report highlights long-term trends, which show that many butterfly species have declined over the last 50 years in both distribution and abundance.



British Antarctic Survey



Last Post from the burning decks of a melting iceberg

22 March, 2023 Emily Newton

Composer Ewan Campbell has written a piece of music for trumpet inspired by the 21-year journey of the A22a iceberg. The new composition was also illustrated onto a British Antarctic ...

[Read more](#)



Breaking records and exploring life in the abyss

21 March, 2023 Huw Griffiths

We are marine biologists that study seafloor creatures, Jamie is doing a PhD investigating Antarctic sea spiders in the University of Galway and Huw works at BAS. Both of us ...

[Read more](#)



Fantastic fjords emerging from glacier retreat

16 March, 2023 David Barnes

The RRS Sir David Attenborough has begun its polar science trials in Antarctica. A team of 30 national and international scientists, engineers and technical staff are working on the ship ...

[Read more](#)

The Francis Crick Institute

Layered website content for public and scientific audiences



We are investigating how retroviruses such as HIV infect and multiply inside cells so that we can understand them better and develop more effective antiviral treatments.

Viruses are tiny particles made of genetic material packed inside a coat made of protein and fat, which can only survive by infecting larger animal, plant or bacterial cells. Once inside, they hijack the cellular machinery in order to make many copies of themselves. These new particles are released from the cell and can infect new hosts, spreading the infection.

Some viruses, known as retroviruses, insert their own genetic material into the host's genome as part of their normal replication process, leading to long-term, chronic infection. Retroviruses cause severe diseases including cancer, but the best-known retrovirus is HIV (human immunodeficiency virus), which infects immune cells and causes AIDS.

More than 36 million people around the world are currently living with HIV/AIDS, and although there are now effective drugs that can hold HIV at bay for many years, it is not yet possible to completely cure or prevent the infection. And there is still much we do not know about exactly how retroviruses infect host cells.

To find out more, we are studying the role of different viral proteins and other molecules inside the cell that help to promote infection. We also study the natural anti-viral defenses of the host. Knowing more about the processes at work as retroviruses infect cells will lead us towards new ideas for antiviral drugs that could help to eradicate HIV and make a major impact on human health.

Contact



[Kate Bishop](#)

Principal Group Leader

Related topics

[BIOCHEMISTRY & PROTEOMICS](#)

[CELL BIOLOGY](#)

[INFECTIOUS DISEASE](#)

[MODEL ORGANISMS](#)

Bishop lab Retroviral Replication Laboratory

Areas of interest

In this section

- Overview
- Publications
- Areas of interest
 - Function of p12
 - HIV capsid
 - Vpx and Vpr
- Vacancies
- Members

Retroviruses cause severe diseases, including immunodeficiency and cancer. The human immunodeficiency virus (HIV) is the most widely known retrovirus due to its impact on human health. The latest figures (WHO/UNAIDS 2017) report that nearly 37 million people globally are living with HIV/AIDS.

Innovative therapeutics for retroviral diseases will hopefully arise from a better understanding of how retroviruses reproduce in the cell, how they interact with host cell factors and how they subvert the host innate and adaptive immune systems. The early stages of the retroviral life cycle are particularly attractive therapeutic targets, with several anti-retroviral drugs and cellular anti-viral factors inhibiting these steps. However, numerous events that occur during these stages are still poorly understood. The three main projects in our laboratory aim to characterise the molecular events that occur once a retrovirus has entered a cell in order to fully understand retroviral replication and provide potential ways in which to manipulate these processes for the benefit of human health.

The retroviral replication cycle

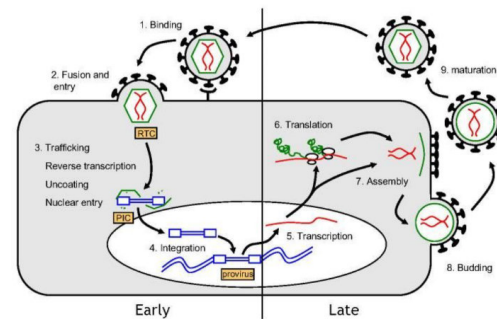


Figure 1. The replication cycle of a retrovirus. The retroviral life cycle is arbitrarily divided into two phases, early and late. The stages in each phase are shown above. Interactions between viral and host cell factors occur at every stage of the viral life cycle, although many are still poorly understood. Identifying and understanding these interactions are key to developing new treatments to combat retroviral diseases. (RTC, reverse transcription complex; PIC, pre-integration complex)

To ENTERTAIN

https://www.instagram.com/damien_kempf/

Senior Lecturer in Medieval History,
University of Liverpool

122,000 followers



© Morgan Library, NY

“The majority of my exchanges on social media are with non-academics, which I find particularly rewarding given that my aim in posting medieval images on Twitter and Instagram is precisely to reach out to people who are not specialists and would not otherwise encounter these images.”



 **damien_kempf** • Follow ...

 **damien_kempf** Photobombing [BnF, Français 166, 15th c.]
18w



 **mono_chrome_lens** High five bro! 
18w Reply

 **brunozilla** When your homey is acting a fool while you're trying to get some 
18w Reply

 **anapriscilapoiesis** @jonaspask 

4,425 likes
MAY 24

Add a comment... Post

The Poetry of Science

"this is sixth form poetry, not Keats or Yeats"

POETRY

PODCAST

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CONTACT



Beneath Shifting Canopies

April 21, 2023

The study of Earth's climate change and its impact on biodiversity reveals that many trees face potential

extinction and decreased diversity, with uncertain consequences for ecosystems and human livelihoods.



Artificial Bites at Night

April 14, 2023

Light pollution might lower mosquito survival by messing with their energy storage. This could potentially make the mosquito biting season longer and make it harder for those living in urban environments to survive the winter.



Lost in Time

April 7, 2023

Circadian disruption can cause health problems, including cancer, diabetes, and problems with brain cells. It can be caused by jet lag, shift work, and artificial light at night.

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<https://thepoetryofscience.scienceblog.com/>

Beneath Shifting Canopies

April 21, 2023 by Sam Illingworth

Stories etched in bark
play out tales
of light and shade,
verdant cells of leaves
and land.

Climate's past whispers
in the boughs,
breaking form
and branch
with every shifting
stage.

A tapestry of life
weaved on fading limbs,
as frozen truths
of ancient climes
spin round once more
on threads worn thin
from wear.

Inside the shadows
of these blizzards past,
our future greens
are draped in doubt
and cast by change.

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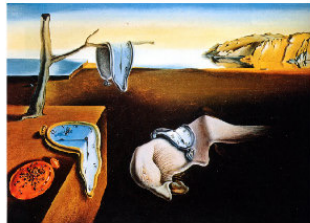
extinction and decreased diversity, with uncertain consequences for ecosystems and human livelihoods.



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<https://thepoetryofscience.scienceblog.com/>

This poem is inspired by [recent research](#), which has found that the diversity of present tree species is shaped by climate change in the last 21,000 years.

Scientists have long studied how Earth's climate has changed over time and how it has affected different types of life. By looking at how climate change has impacted biodiversity in the past, they can better understand the potential risks of future climate change. However, it's still not clear how climate change affects biodiversity in different areas.

In this new study, scientists investigated how climate change has affected the diversity of angiosperm trees (i.e., flowering trees with seeds enclosed in a fruit/protective covering) using a new global survey of 1,000 forest areas. They analysed the changes in tree types in neighbouring regions over time and found that areas with larger temperature changes between glacial and interglacial periods had lower species turnover (i.e., fewer new species of trees replacing old ones in a particular area over time) and higher richness changes (i.e., more new types of trees being added to an area over time). The study also indicated that certain tree species were more likely to survive and thrive during past climate change events, while others became extinct or were unable to spread to new areas. These findings suggest that if climate change continues at its current rate, the diversity of angiosperm trees worldwide may decrease, which could have detrimental impacts on ecosystems and human livelihoods.

To INTERACT

The Francis Crick Institute

Public exhibitions

<https://www.crick.ac.uk/whats-on/exhibitions/cut-paste/cut-paste-online-exhibition>

PART ONE

What is genome editing?

The average human being is made of more than 30 trillion cells. These form your skin, bones, brain, and every other bit of your body. And in almost all of your cells there is a copy of your unique instruction manual: your genome.

To understand how this manual can be edited by 'cutting and pasting', first it's helpful to know how we are constructed...

**If you could
change one thing
about yourself,
what would
it be?**

What are you made of?



What makes you you?



What is genome editing?





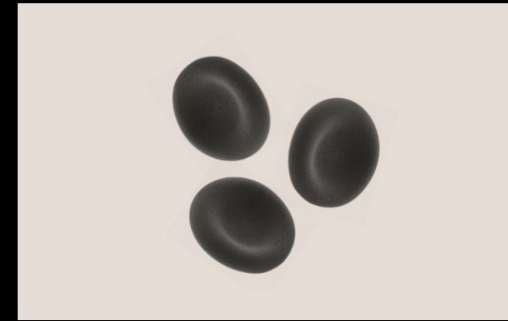
Plant power

Should genome editing be used to help solve global health issues?



Climate-friendly cows

Should genome editing be used to help solve environmental crises?



Sickle cell disease

Should genome editing be used to cure inherited diseases?



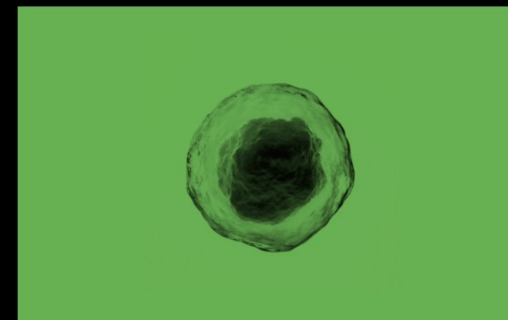
Super humans

Should genome editing enhance our minds and bodies?



Malaria research

Should genome editing be used on entire species to get rid of infectious diseases?



New frontiers

Should we use heritable human genome editing for challenges that could be solved in other ways?

Where do you draw the line?

How do you feel about using genome editing tools to alter an entire species to save human lives?

No way

I don't think so

Hmm...not sure

Okay with me

Bring it on

VOTE

VIEW RESULTS



The house sparrow grabs top spot again!

This bold, noisy, community-minded bird has landed in top spot in Birdwatch, for the 20th year in a row, despite more than 10 million pairs disappearing in the UK since the late 1960s. However, [house sparrow](#) numbers have remained relatively stable over the last twenty years with signs of increases in some parts of the UK.





Can you share any other examples?

Who do you think does this well?



What makes those examples good?



How do people read
online?

The science of reading

“Reading is the ability to extract visual information from the page and comprehend the meaning of the text”

- Keith Rayner and Alexander Pollatsek's *Psychology of Reading*

- Readers' eyes don't read one word and then move on to the next – they jump about all over the place
- The more familiar your words are to the reader, the faster the reader can understand what they mean

From the age of 9, your eyes can miss 30% of text on the page and your brain will still accurately predict the content

Reading online

People only read 20-28% of the page

- Jakob Nielsen

People scan, they don't read. They are naturally efficient with their time and effort.

How
important
is task?

What
type of
task?

Level of
focus

Personal
approach

<https://www.nngroup.com/articles/how-people-read-online/>
<https://www.nngroup.com/articles/text-scanning-patterns-eyetracking/>

F-pattern

In the absence of subheadings and bullets, users tend to fixate on the words toward the beginning of lines and toward the top of the page.



Layer-cake pattern

Fixations on the page's headings and subheadings, with deliberate occasional fixations on the (body) text in between.

If you want path toward accelerating innovation at city scale — transit is the place to do it.

The thing that makes us so excited about the potential of transit is that it takes the solitary experience of the internet — a person and a screen — and brings it to this heaving cultural mashup. Those self-selected, self-affirming circles of our internet experience need to be offset by the kind of diversity that exists in any 10-square-foot of mass transit. And when we add the intelligence of the internet to that kind of shared, democratic experience, we just might be able to reveal the true potential of the internet — to connect humans and make us more tolerant, understanding and empathetic.

And if you want to see the impact of new technology in cities, transit is where you can get the most immediate and intense feedback from people of all kinds — from digital natives to senior citizens, from financiers to refugees.

Transit authorities can get things done

There are many barriers to entry that make getting things done in cities hard. The competition is fierce, the regulations and regulations among a million committees, and the constraints are plentiful — plus, it's what makes cities great, but it also makes it difficult to move at the pace of technology.

But transit systems are different. They are generally operated and managed by a sole authority and act more like a corporation than a government bureaucracy. And because they are autonomous organizations, they have control over everything that happens inside them. Decisions and changes can be made quickly, and implemented with relative speed universally within the system. If you want path toward accelerating innovation at city scale — transit is the place to do it.

Transit systems have what innovation requires to be successful - a built-in user base with massive scale

Transit already has built-in scale — millions of people use it every day, in every major city. And, unlike the complex web that makes up cities, transit is a contained, contained ecosystem. Every conceivable touchpoint of a journey exists, from planning to wayfinding, safety and security, from operational enhancements to advertising, communications and point-of-purchase.

This built-in user base and multifaceted journey opens the door for outside investment and innovation. Introducing even a small data-driven improvement that can be immediately deployed onto a flexible digital infrastructure can yield massive benefits.

There is an expectations gap

Getting around in cities took nothing like 10 or 15 years ago, let alone 10. A single trip a few miles away can easily involve two or three modes. And the cockpit of the rideshare I took recently had seven interactive displays with real-time information and services — the number of the typical train car? None. We have choices, and we want information and convenience.

And this hasn't gone unnoticed by transit authorities. There's been a subtle but important shift in the way they operate: Users are no longer simply riders, but customers. Providing safe, reliable service is table stakes — transit authorities know they need to deliver an



Core writing **principles**













Web 'accessibility' online

Web accessibility means that websites, tools, and technologies are designed and developed so that people with disabilities can use them.

Accessibility is not just about disability, it is about universality.

- It is about the inclusion and participation of people with disabilities using the web.
- It means making your digital content accessible to **all internet users**.

Design decisions disable people

	Permanent	Temporary	Situational
Touch	 One arm	 Arm injury	 New parent
See	 Blind	 Cataract	 Distracted driver
Hear	 Deaf	 Ear infection	 Bartender
Speak	 Non-verbal	 Laryngitis	 Heavy accent

Accessible writing – plain English

Making content **clear** and **understandable** opens writing up for users with different literacy levels and access challenges.

<https://readabilityguidelines.co.uk/clear-language/plain-english/>

- Web Content Accessibility Guidelines (WCAG) say: "using the clearest and simplest language appropriate is highly desirable."
- The United Nations recommends plain language for communications.

Choose easy and short words not formal, long ones.

- Write for the reading comprehension of a 9 year old.
 - helps your **content reach** the most users
 - makes your content **easier to scan** read

"buy" not "purchase"

"help" not "assist"

"about" not "approximately"

"use" not "utilise"

Keep your sentences and paragraphs short too

- The maximum sentence length for a good level of comprehension is 25 words. Split long sentences up into 2 or 3, or use bullet points.
- Oxford Guide to plain English, GOV.UK and linguists agree:
 - 15 word sentences are more likely to be comprehensible
 - 25 words is a good maximum sentence length limit
 - above 40 words sentences are hard to comprehend easily
- 5 sentence paragraphs

BUT...

Keep sentence length varied - A mix of slightly shorter and slightly longer sentences can make reading more interesting.

Jargon and buzzwords are unlikely to be clear language

- These words are too general and vague and can lead to misinterpretation or empty, meaningless text.
- Think about what the term actually means and describe that.
- Be **open** and **specific**.

"Let's touch base in 10 and do some blue sky thinking."

or

"Let's meet in 10 minutes to think of some ideas."

Explain technical terms

- Technical terms are not jargon – you will need them!
- Explain what they mean the first time you use them.



Write conversationally, in first person, using the active voice

- Picture your audience and write as if you were talking directly to them, with the authority of someone who can help and inform.

Test your content with users

- What is clear to you may not be for someone else.
- 

Isn't this 'dumbing down'?

- Research shows that **higher literacy people prefer plain English** because it allows them to understand the information as quickly as possible.
 - Research into use of specialist legal language in legal documents found that 80% of people preferred sentences written in clear English
 - the more complex the issue, the greater that preference the more educated the person and the more specialist their knowledge, the greater their preference for plain English
- People understand complex specialist language, but do not want to read it if there's an alternative. People with the highest literacy levels and the greatest expertise tend to have the most to read.

<https://gds.blog.gov.uk/2014/02/17/guest-post-clarity-is-king-the-evidence-that-reveals-the-desperate-need-to-re-think-the-way-we-write/>




“It’s not dumbing down, it’s opening up”

- Sarah Richards, “Content Design”

“It’s not dumbing down – it’s opening up”

- It **communicates information succinctly and efficiently** so that readers understand the message quickly
- It **benefits everybody**, from expert readers to international users and people who use English as a second language.
- It is **easily searchable** and will often gain you a better search engine ranking.
- It is **welcomed by readers**; in fact, studies show that it makes the writer look smarter. (If people understand more of what you’re saying, they will likely feel that you make sense.)



“ To write gallery text that is captivating, illuminating, and comprehensible for a wide audience is difficult but not impossible to reach. To achieve this, **we do not have to ‘dumb down’ our scholarship** and collections.

Instead, we have to **recognise visitors’ needs and interests**, and use the devices of good writing to communicate our ideas. By good writing, we do not simply mean clarity and correct grammar. To appeal to our visitors in the busy environment of the museum, text also needs **personality, life and rhythm**. Only these qualities of communication will highlight the ingenuity of our collections and enrich the imaginations of our visitors in the way that we promise.



<https://www.vam.ac.uk/blog/museum-life/getting-it-write>

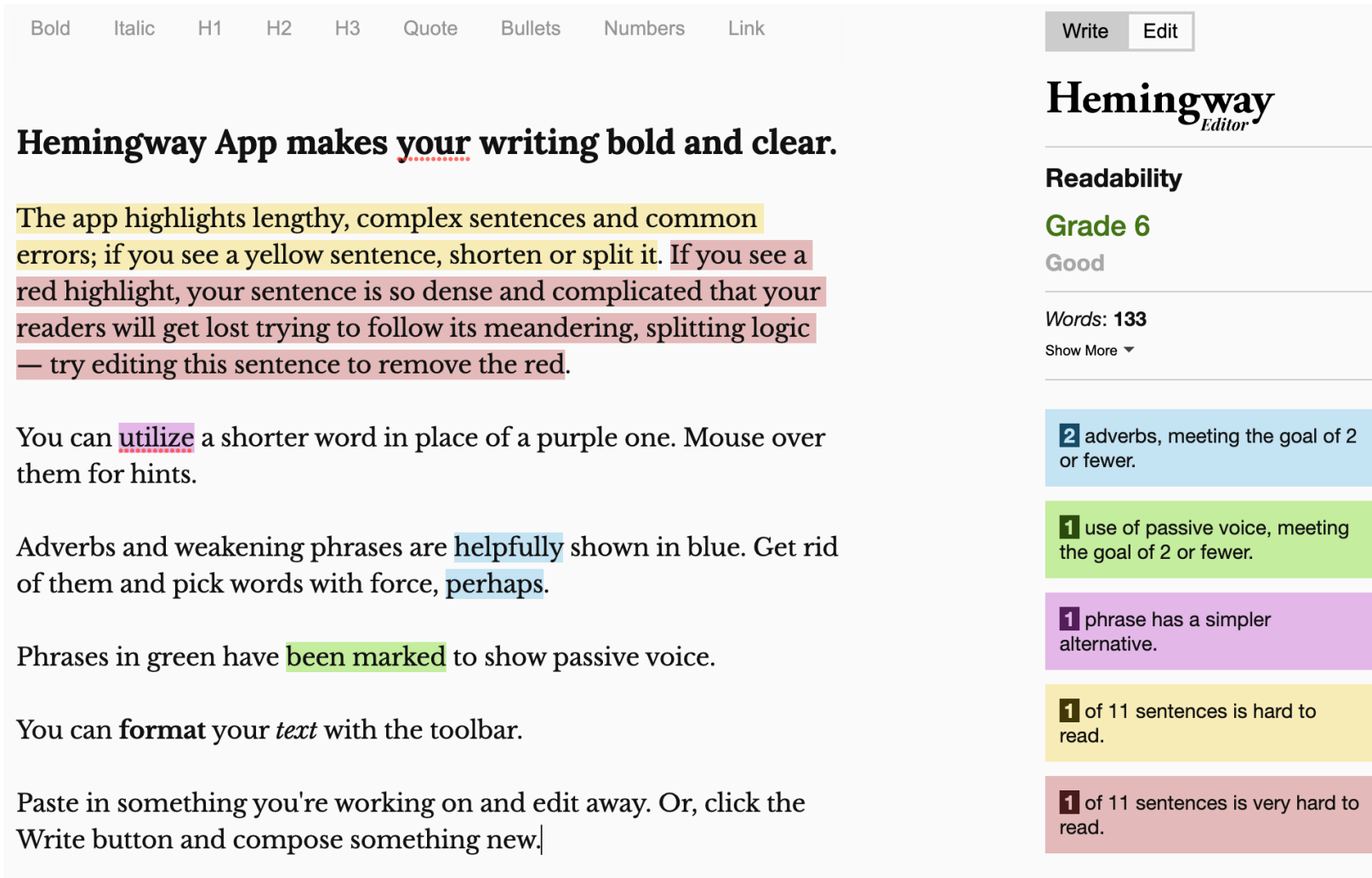
George Orwell's 6 rules of writing

1. Never use a metaphor, simile, or other figure of speech which you are used to seeing in print.
2. Never use a long word where a short one will do.
3. If it is possible to cut a word out, always cut it out.
4. Never use the passive where you can use the active.
5. Never use a foreign phrase, a scientific word, or a jargon word if you can think of an everyday English equivalent.
6. Break any of these rules sooner than say anything outright barbarous.



Your turn

<https://hemingwayapp.com/>



The screenshot displays the Hemingway Editor interface. At the top, there is a toolbar with options: Bold, Italic, H1, H2, H3, Quote, Bullets, Numbers, and Link. Below the toolbar, the main text area contains the following content:

Hemingway App makes your writing bold and clear.

The app highlights lengthy, complex sentences and common errors; if you see a yellow sentence, shorten or split it. If you see a red highlight, your sentence is so dense and complicated that your readers will get lost trying to follow its meandering, splitting logic — try editing this sentence to remove the red.

You can utilize a shorter word in place of a purple one. Mouse over them for hints.

Adverbs and weakening phrases are helpfully shown in blue. Get rid of them and pick words with force, perhaps.

Phrases in green have been marked to show passive voice.

You can format your *text* with the toolbar.

Paste in something you're working on and edit away. Or, click the Write button and compose something new.

On the right side, there is a sidebar with the following information:

- Buttons: Write, Edit
- Logo: Hemingway Editor
- Section: Readability
- Grade: Grade 6
- Status: Good
- Words: 133
- Show More (dropdown arrow)
- Feedback items:
 - 2 adverbs, meeting the goal of 2 or fewer.
 - 1 use of passive voice, meeting the goal of 2 or fewer.
 - 1 phrase has a simpler alternative.
 - 1 of 11 sentences is hard to read.
 - 1 of 11 sentences is very hard to read.



Structuring your content

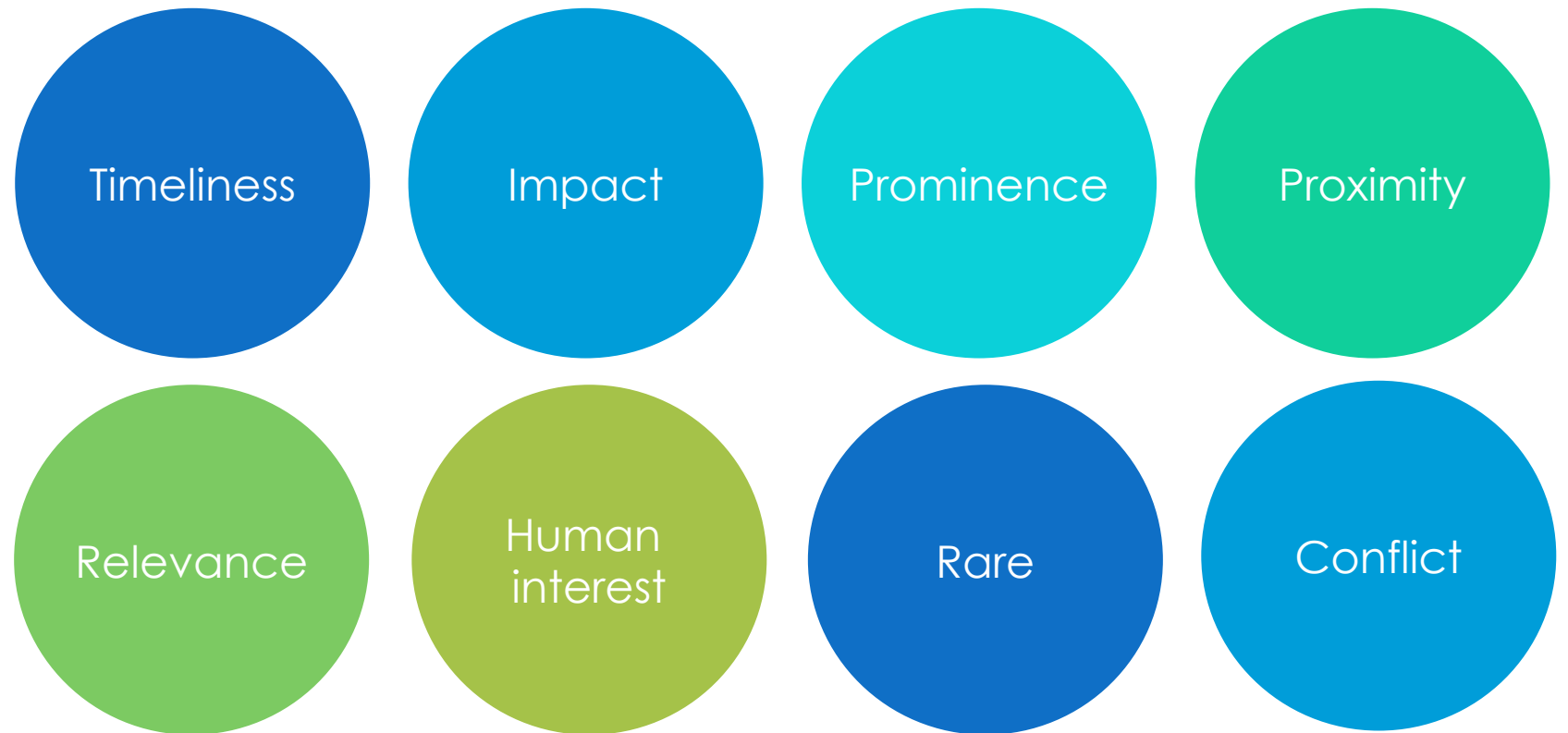
e.g. blog posts, web introductions

Questions to consider

- **Who** are your audiences?
 - Try to be specific
- What do you want them to **do**?
 - Are there tangible actions you would like your reader to take?
 - Is it about changing minds rather than tangible action?
 - Do you want them to share your content?
- **Where** are they reading?
 - Inform your platform choice

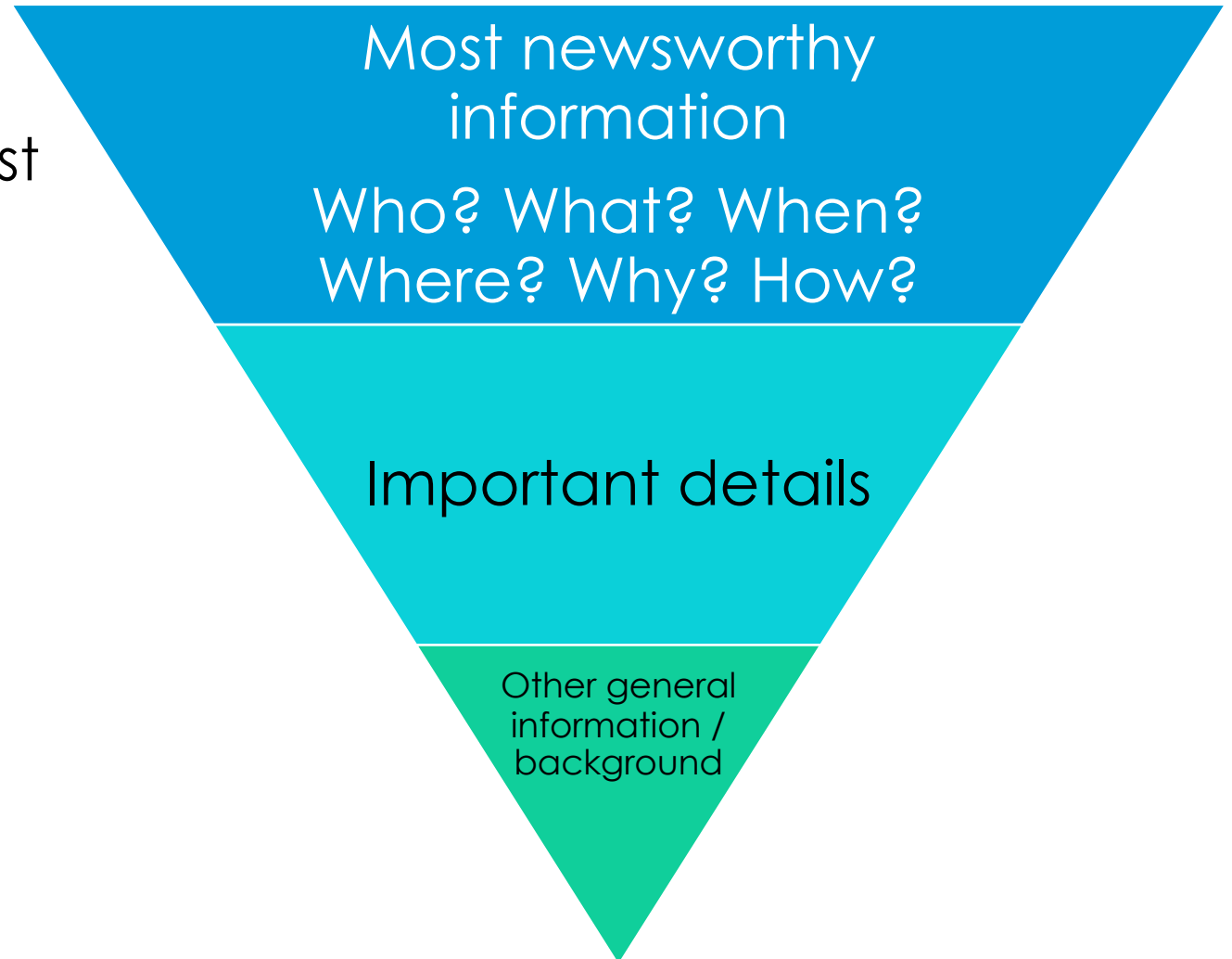
Consider the news value

- What will make your content interesting, useful and shareable to your readers?



Structure your writing – informative writing

- Get to the point quickly – first 100 words should offer the most crucial information
- Priority is to get information across to as many people as possible quickly



Garden scraps: British wildlife clash over leftover food

Badgers, hedgehogs, foxes and cats are becoming embroiled in fights and stand-offs over food left in British gardens, a study has revealed.

27 February 2023

Wildlife conservation experts at the University of Brighton and Nottingham Trent University analysed hundreds of videos supplied by members of the public to investigate interactions within and between different species.

The researchers found that while food left by people in urban gardens - leftovers or commercially bought for this purpose - can provide benefits for wild animals, it can also bring competitors and predators into close proximity.

While badgers tended to dominate other species in the garden hierarchy, hedgehogs were also found to have more clashes than expected, the study revealed.




Aggressive and submissive behaviour among animals in the footage was found to be more common than neutral interactions - from 316 instances where animals were spotted together 175 ended in confrontation.

Animals were more likely to confront different species than their own. Cats and foxes were found to take a particular

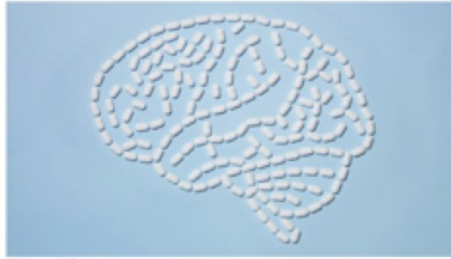


Structure your writing – informative writing

- Help your readers to scan
 - Use sub-headings
 - Lists
 - Links
 - Quotes
 - Images
- 

Scientists Engineer An Opioid That May Reduce Pain With Less Risk

August 17, 2016 | 3:31 PM ET
Aishwini Mariani



TS Photography/Getty Images

Once people realized that opioid drugs could cause addiction and deadly overdoses, they tried to use newer forms of opioids to treat the addiction to its parent. Morphine, about 10 times the strength of opium, was used to curb opium cravings in the early 19th century. Codeine, too, was touted as a nonaddictive drug for pain relief, as was heroin.

Those attempts were doomed to failure because all opioid drugs interact with the brain in the same way. They dock to a specific neural receptor, the mu-opioid receptor, which controls the effects of pleasure, pain relief and need.

Now scientists are trying to create opioid painkillers that give relief from pain without triggering the euphoria, dependence and life-threatening respiratory suppression that causes deadly overdoses.

That wasn't thought possible until 2000, when a scientist named Laura Bohn found out something about a protein called beta-arrestin, which sticks to the opioid receptor when something like morphine activates it. When she gave morphine to mice that couldn't make beta-arrestin, they were still numb to pain, but a lot of the negative side effects of the drug were missing. They didn't build tolerance to the drug. At certain dosages, they had less withdrawal. Their breathing was more regular, and they weren't as constipated as normal mice on morphine.

Before that experiment, scientists thought the mu-opioid receptor was a simple switch that flicked all the effects of opioids on or off together. Now it seems they could be untied. "The hope is you'd have another molecule that looks like morphine and binds to the same receptor, but the way it turns the receptor on is slightly different," says Dr. Aashish Manglik, a researcher at Stanford University School of Medicine who studies opioid receptors.

After Bohn's discovery, a number of people, including a team that includes Manglik, started looking for a drug that could connect to the mu-opioid receptor in a way that avoids the negative effects of beta-arrestin.

To do that, they mapped the receptor's structure in a computer program and started looking for chemicals that would stick to it. "We tried to look for molecules that would still bind to this 3-D structure, but are as far away from morphine and codeine as possible," Manglik says.

The team ran 3 million possibilities through the computer and picked the 23 best candidates to test in a lab. One chemical, PZM21, seems to do what they hoped: Turn the opioid receptor on without using much beta-arrestin. They report their findings in Nature on Wednesday.

The scientists then tweaked the chemical to make it more potent and gave it to mice. The mice had pain reduction similar to that with morphine. But their breathing was more normal, and they didn't seem to get high.

"If you give a mouse a drug that activates its reward pathways like cocaine, amphetamine or morphine, the mice just run around more. In this compound, we saw very little of that," Manglik says. The mice also didn't seem to have a preference between the chemical and salt water.

That means it's possible that the compound is less lethal and has less potential for abuse compared

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New Opioid Painkiller With Fewer Health Risks

August 17, 2016 | 3:31 PM ET
Aishwini Mariani



TS Photography/Getty Images

Opioid painkillers such as morphine and codeine are used to alleviate pain, but painkillers have risks. They suppress breathing, are highly addictive, and can lead to overdose.

How opioids work

All opioid drugs interact with the brain in the same way. They dock to a specific neural receptor, the mu-opioid receptor, which controls the effects of pleasure, pain relief and need.

Now scientists are trying to create opioid painkillers that give relief from pain without triggering the euphoria, dependence and life-threatening respiratory suppression that causes deadly overdoses.

Beta-arrestin, the culprit of negative effects

In 2000, Dr. Laura Bohn discovered a protein called beta-arrestin, which sticks to the brain's opioid receptor after it's activated by something like morphine. When she gave morphine to mice that couldn't make beta-arrestin, they were still numb to pain, but a lot of the negative side effects of the drug were missing:

- They didn't build tolerance to the drug.
- At certain dosages, they had less withdrawal.
- Their breathing was more regular, and they weren't as constipated as normal mice on morphine.

Scientists find drug to block beta-arrestin

After this discovery, researchers started to explore different possibilities of drugs that could connect to our brain's mu-opioid receptor and avoid the negative effects of beta-arrestin.

According to Dr. Aashish Manglik, a Stanford University researcher:

"The hope is you'd have another molecule that looks like morphine and binds to the same receptor, but the way it turns the receptor on is slightly different."

PZM21: New opioid with fewer negative effects

Scientists traced the receptor's structure in a software program and started searching for chemicals that would adhere to the mu-opioid receptor.

The team ran 3 million possibilities through the computer and picked the 23 best candidates to test in a lab. One chemical, PZM21, seems to do what they hoped: Turn the opioid receptor on without using much beta-arrestin.

In lab studies, the mice had pain reduction similar to that with morphine. But their breathing was more normal, and they didn't seem to get high.

That means it's possible that the compound is less lethal and has less potential for abuse compared to something like morphine, but it still might be as effective of a painkiller. However, that will only happen if PZM21 works the same way in humans.

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Capture attention immediately – think about your headline

- Use your headline to capture attention
 - Keep it short and simple – easy to understand
 - Grab attention – but don't oversell
 - Reveal your theme – tell a story
 - Front load with keywords
 - Take your time (do it last?)
 - 8–12 words

Storytelling techniques

Characters are at the heart of compelling story telling

1. *A protagonist faces a problem*
2. *There is a journey / conflict*
3. *There is resolution – the problem is overcome*

Suspense

Immersion

Personalities

Demonstration

Relevance

Speak directly to your reader

Surprise

A compelling ending (or question)

Shorter form content – social media

- Even less space to capture attention!
- **Use camel case for multi-word hashtags.** Capitalise the first letter of each word to make hashtags more legible and prevent screen reader issues
- **Limit emoji use.**
- **Provide descriptive image captions.**
- **Don't embed content within images** without including the full text in the alt-text



ESA @esa · 11h · 📷

This NASA/ESA @HUBBLE_space Telescope image shows galaxy cluster ACO S520 which contains, as well as several large elliptical galaxies, a ring-shaped galaxy on the right. A pair of bright stars seen at the top left have four long criss-crossing diffraction spikes 🏹... [Show](#)

Image description

A collection of oval-shaped, elliptical galaxies. The largest has two neighbouring bright spots in the core. It and two others look like galaxy clusters, with surrounding smaller galaxies. On the left edge of the image are two bright stars with four long spikes, and on the right edge is a small ring-shaped galaxy. Smaller stars and galaxies are spread evenly across the dark background.

Dismiss

ALT

ESA Science

What next?

- So what? Who cares?
- Calls to action
 - What do you want your reader to **THINK**, **FEEL** or **DO**?
 - Include an invitation to achieve that



To
INFORM

To
ENTERTAIN

To
INTERACT



Your turn

- Try adding some structure to your piece of writing
- What is the 'call to action'?



Editing **techniques**

Editing and proof-reading techniques

- Remind yourself of what you set out to write – the purpose and outcomes
- Reverse outlines – post-it per paragraph. Summarize each paragraph –
 - Does the flow make sense?
 - Is it repetitive?
 - Does each paragraph smoothly connect?
- Is the call to action clear?

Editing and proof-reading techniques

- Use the spelling and grammar checker that is part of Microsoft Word
- Print it out and use a ruler to slow you down!
- Make it look unfamiliar by changing the font/colour
- Take a break from it or change location
- Read it out loud (or use text-to-speech software, such as the Immersive Reader on Word Online)
- Keep a checklist of common mistakes you make – and check them each time
- Ask someone else to review it

Pair writing and editing

- Start from the same page
 - What questions will your reader have?
 - What change/action are you trying to create?
 - What information do you have to include?
- One screen (or Google Docs online)
- One person – the subject matter expert – is in control of the keyboard and starts writing
- Second person asks questions, makes suggestions, ask about particular words or phrases
- Swap occasionally

<https://gds.blog.gov.uk/2016/09/21/it-takes-2-how-we-use-pair-writing/>

Checklist

Planning your content	Writing your content	Editing your content
<ul style="list-style-type: none"><input type="checkbox"/> What is the primary purpose of your content?<input type="checkbox"/> Who is it for?<input type="checkbox"/> Where will they read it?<input type="checkbox"/> What is the call to action?<input type="checkbox"/> Consider the 'news value' or 'storytelling approach'	<ul style="list-style-type: none"><input type="checkbox"/> Can you cut excess words or paragraphs?<input type="checkbox"/> Can you remove jargon?<input type="checkbox"/> Can you simplify words or sentences?<input type="checkbox"/> Have you added structure like subheadings and bullet points?<input type="checkbox"/> Are your headings clear, front-loaded and include keywords?	<ul style="list-style-type: none"><input type="checkbox"/> Have you completed a readability check?<input type="checkbox"/> Have you asked someone else to read it?<input type="checkbox"/> Is the main point clear immediately?<input type="checkbox"/> Is the call to action clear?<input type="checkbox"/> Do any terms need defining?



Your turn

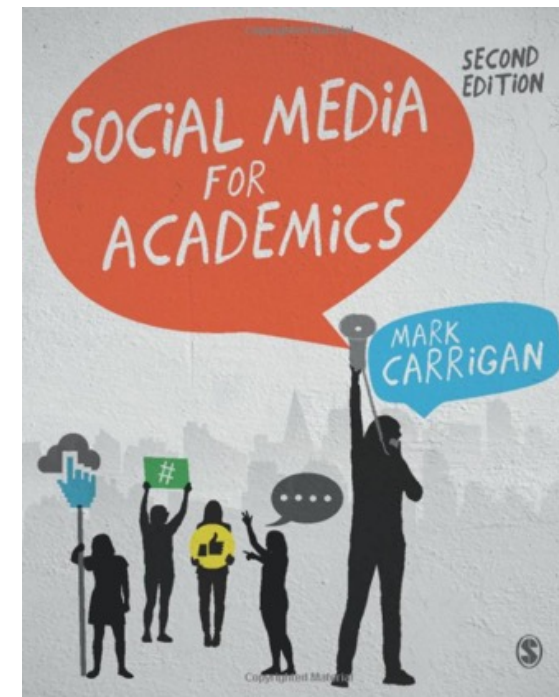
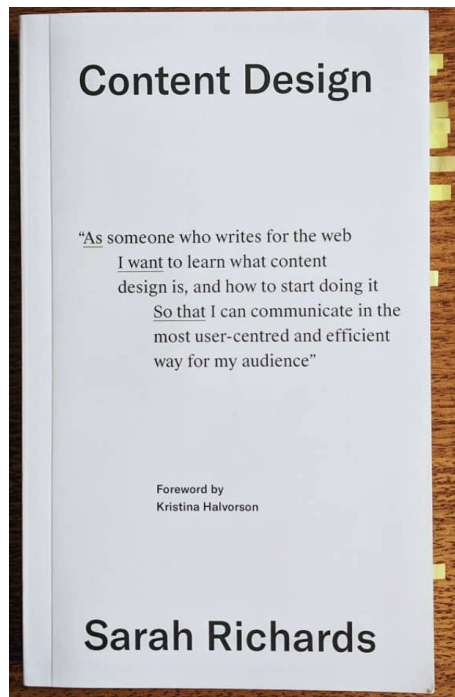


Resources for the **future**

Resources

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Password: Brighton

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Thank you!

hello@pamelaagar.com