How to write about science for a general audience

Edyta Zielinska
Science Communications Manager

Jefferson
HOME OF SIDNEY KIMMEL MEDICAL COLLEGE

Science Writing 101

Objective:

Equip you with the tools to effectively write about science for the general public.

Today's agenda:

- What makes a good story?
- Anatomy of a news article
- Practice: reverse-outline a news article
- 2 additional story styles commonly used in the popular press
- Media Prep Guidance
- Start Writing

Why write for a general audience?

Translating your science is important for:

- broadening your audience
- poster presentations
- grant proposals
- interviews with reporters
- job interviews
- a career as a science writer
- social media
- improving your research

What makes a good story?

Conflict or tension What problem that needs solving?

Characters - The subject of your story.

Setting - What's known or unknown in the field?

Plot - All of these elements combine to form a narrative arc.

Word Choice

Jargon

"Starting in college, scientists get accustomed to using scientific jargon. It's how they impress their professors. It's how they get taken seriously. Pretty soon, they start thinking that everybody knows what interferometry is."

– Carl Zimmer

Words - Jargon – check your meaning

Terms that have different meanings for scientists and the public		
Scientific term	**Public meaning**	**Better choice**
enhance	improve	intensify, increase
aerosol	spray can	tiny atmospheric particle
positive trend	good trend	upward trend
positive feedback	good response, praise	vicious cycle, self-reinforcing cycle
theory	hunch, speculation	scientific understanding
uncertainty	ignorance	range
error	mistake, wrong, incorrect	difference from exact true number
bias	distortion, political motive	offset from an observation
sign	indication, astrological sign	plus or minus sign
values	ethics, monetary value	numbers, quantity
manipulation	illicit tampering	scientific data processing
scheme	devious plot	systematic plan
anomaly	abnormal occurrence	change from long-term average

Source: Physics Today, October 2011, Resource: Zimmer's Index of banned words

Who are your characters?

- Is your researcher a character?
- Are the molecules the characters?
- What does the character do?
  - a) How does this character (protein, gene, molecule, disease type, etc) fit within the broader context of the story?
  - b) How does this character behave, why is it important?
  - c) limit cast of characters

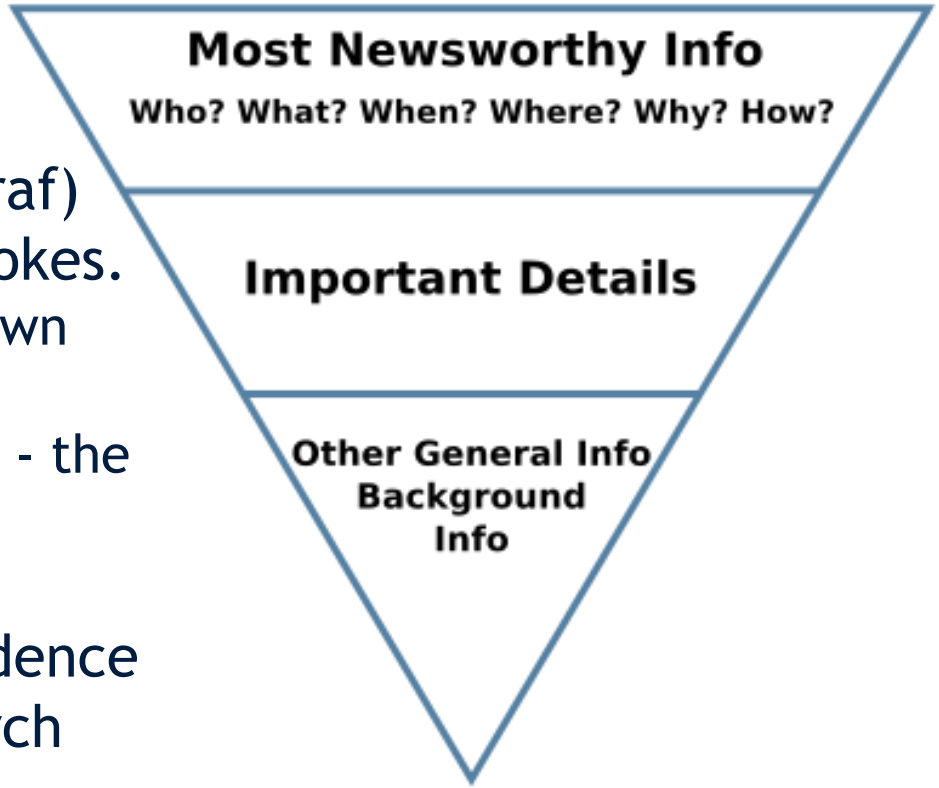
Types or styles of story

- News story/brief
- Tips/Myths/Listicle
- Q&A
- Portrait or profile

Anatomy of a news story

Structure:

- Headline, subheadline
- 1st paragraph: Lede (nut graf) the essentials, in broad strokes.
  - 1 sentence for what's known
  - 1 sentence for problem
  - 1 sentence for the finding - the solution to that problem
- Quote
- More background / the evidence
- What's next - future research



Length: usually 400-700 words

Headlines

Exposure to the synthetic progestin, 17α-hydroxyprogesterone caproate, during development impairs cognitive flexibility in adulthood

Headline: Hormone Hangover

Subhead: Medication to prevent prematurity in humans harms cognitive flexibility in rats.

A lede (lead), or first paragraph

- **“A lead (a first paragraph - that isn’t always first) is a promise. It promises that the piece of writing is going to be like this...”**

- **“A lead is good not because it dances, fires cannons or whistles like a train, but because it is absolute to what follows.”**
- Source – John McPhee, Pulitzer Prize winning author, Wall Street Journal

Lede - example

Hormone Hangover
Medication to prevent prematurity in humans harms cognitive flexibility in rats.

Expectant moms at risk of premature delivery may receive a steroid hormone boost in the form of a synthetic progesterone, which lengthens gestation. The developing brain is sensitive to steroid hormones, but few studies have looked at whether these drugs affect cognition. So Jari Willing and Christine Wagner of the University at Albany-SUNY exposed newborn rats to 17-OHPC to model a human fetal phase when cognitive flexibility develops.

Source: The Scientist, Jyoti Madhusoodanan, Feb1, 2016

Body of the news piece: choose evidence wisely

To prevent oversimplification, be sure to connect the dots. An overly simple story isn't satisfying.

- What did researchers think was happening before they tested it?
- What were the most convincing experiments?
- What are the biggest most illustrative numbers to support the finding?
- How do they connect to each other in a logical progression of ideas?

Ending: The take home message

Hormone Hangover//Medication to prevent prematurity in humans harms cognitive flexibility in rats.

“They show that exposure to these synthetic hormones during certain critical periods can have long-term consequences on cognitive development,”

Try it - reverse outline a story

Take the article and reverse-outline it. Zoom Annotation

1. Context - what's already known in the field
2. Problem - the set-up
3. Solution - finding
4. Main characters? Supporting characters?
5. Impact - why should we care?
6. Jargon

The popular party drug 3,4-methylenedioxymethamphetamine (MDMA), otherwise known as ecstasy, promotes feelings of friendliness, warmth, and euphoria in the user. These effects have spurred investigations into the drug's potential to enhance psychotherapy sessions for patients with autism or post-traumatic stress disorder. However, concerns of misuse have held up clinical applications. Today (December 11) in Science Translational Medicine, researchers show in mice that the drug's prosocial effects and potential for abuse are controlled by two separate neurological mechanisms, raising the possibility of designing new drugs that could elicit the benefits without the downsides.

- Ruth Williams, *The Scientist*, Dec 11, 2019.

Tips/Myths and other listicles

- Easy-to-read bulleted content
- Tight prose, with well-researched and cited (linked) answers.
- Very short intro 2-3 paragraphs intro. Why should we care?
- Tips/myth headers should be specific and non-obvious.
- Use Jefferson research as a jumping-off point for the piece

Q&A with an expert

- Choose a compelling topic (and find an expert for that topic) or find a compelling person.
- 2-3 paragraphs of short intro, plus 4-5 headers of Q&A. Should not exceed 1500 words.
- For the assignment, you can prepare questions, and draft responses based on your knowledge and research on the topic.
- Edit heavily - choose your best questions/answers and edit for flow, clarity, and repetition. Don’t edit personality out!

How to Prepare for Media Interviews.
(And how knowing story styles can help)

Print - magazine or newspaper

- Print reporters love illustrative details
- Think about anecdotes that help tell the story
- prepare metaphors to relay to lay audience

Broadcast - radio or TV

- Prepare visuals - things you can show (TV) or describe (radio)
- Practice take-home messages - simple, clear, impactful, accurate
- Know the difference between recorded vs. live interview

Working with your Media Relations Group

Your press officers are here to help! It's also Jefferson policy to contact your PR (public relations or media relations) department prior to interviewing with the media.

How your PR department can help:

- What not to wear to a TV interview (stripes, plaid)
- How to prepare take-home messages and key points
- How to ensure your work is not misconstrued
- Make sure the reporter is writing for a reputable outlet
- Rules of engagement: is everything you say on the record?

Deliverable

- Write your first piece in a style of choice. We can help you choose.
- You get 3 points for submitting on time by Jan 26th. You get 2 points for submitting any time after that. PSERT will edit
- Write about Jeff research - your own or someone else's
- We'll send you hand-outs and articles

Jefferson Research to choose from

- Managing migraine in pregnancy and breastfeeding.
- Sox9 deletion causes severe intervertebral disc degeneration characterized by apoptosis, matrix remodeling, and compartment-specific transcriptomic changes.
- Assessment of Critical Feeding Tube Malpositions on Radiographs Using Deep Learning.
- Mitochondrial Quality Control in Age-Related Pulmonary Fibrosis.
- Prehospital epidemiology and management of injured children in Kigali, Rwanda

Worksheets Sample: Plan your writing

Lede: What's new and why does it matter? 1. Context - what's the big picture this study fits into? 2. Problem - what question does this research aim to answer? 3. Solution/finding	
Body: What evidence supports the finding or conclusion? What experiments were most convincing? Further background or explanation, as needed.	
What's next? Ending/kicker	
Headline, subhead	

Practice

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OR

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