

Science Writing Workshop: How to tell a story, How to conduct an interview



Organization: Materials Research Society

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General Description

Science is an important part of our society, our future and our values. It can influence broad topics such as governmental and corporate decision making or directly impact the consumer through personal, economic or environmental risks and benefits that influence a person's willingness to adapt to new technology. Effective and engaging written communication between the scientist and the nonscientist is critical to influencing the perception of science.

Type of Program:

This is a full-day interactive lecture/workshop. It is designed for researchers, scientists, science educators and students who are interested in journalism and science writing. The program focuses on writing science stories that engage both the general public and other scientists. Participants learn about various forms of science writing, helpful resources and potential career opportunities.

The workshop is divided into two sessions. The first section emphasizes techniques to enhance the narrative by identifying and incorporating the components of a good story into various samples of media. The second session provides practical instruction in effective interviewing skills through exercises that emphasize drawing out the elements of an engaging story. Through the pre-class assignments and workshop activities, participants will develop writing samples for their professional portfolio. At the completion of the workshop, participants are invited to submit a writing project for review and possible publication.

Program Objectives

Big Idea:

A science journalist can facilitate communication between scientists and non-scientists by writing engaging stories that draw the reader into the content.

Learning Goals:

- Gain greater appreciation for the importance of communication skills in science and engineering careers
- Gain greater appreciation for enhancing science literacy through written media
- Become involved in science communication and outreach through one or more forms of media

Learning Outcomes:

As a result of participating in this program, participants will be able to:

- Enhance written communication skills to maximize impact in the media
- Incorporate elements of storytelling into journalistic science writing
- Improve interviewing skills through targeted questions
- Determine appropriate resources and techniques to capture relevant content and quotes during an interview
- Start a professional portfolio of writing samples
- Determine possible career paths in science journalism

NISE Network content map main ideas:

- [] 1. Nanometer-sized things are very small, and often behave differently than larger things do.
- [] 2. Scientists and engineers have formed the interdisciplinary field of nanotechnology by investigating properties and manipulating matter at the nanoscale.
- [] 3. Nanoscience, nanotechnology, and nanoengineering lead to new knowledge and innovations that weren't possible before.
- [] 4. Nanotechnologies have costs, risks, and benefits that affect our lives in ways we cannot always predict.

[Place an "x" in the brackets above to indicate big ideas covered in the program.]

National Science Education Standards:

- [] 1. Science as Inquiry
 - [] K-4: Abilities necessary to do scientific inquiry
 - [] K-4: Understanding about scientific inquiry
 - [] 5-8: Abilities necessary to do scientific inquiry
 - [] 5-8: Understanding about scientific inquiry
 - [X] **9-12: Abilities necessary to do scientific inquiry**
 - [X] **9-12: Understanding about scientific inquiry**
- [] 2. Physical Science
 - [] K-4: Properties of objects and materials
 - [] K-4: Position and motion of objects
 - [] K-4: Light, heat, electricity, and magnetism
 - [] 5-8: Properties and changes of properties in matter
 - [] 5-8: Motions and forces
 - [] 5-8: Transfer of energy
 - [] 9-12: Structure of atoms
 - [] 9-12: Structure and properties of matter
 - [] 9-12: Chemical reactions

- 9-12: Motions and force
- 9-12: Conservation of energy and increase in disorder
- 9-12: Interactions of energy and matter

3. Life Science

- K-4: Characteristics of organisms
- K-4: Life cycles of organisms
- K-4: Organisms and environments
- 5-8: Structure and function in living systems
- 5-8: Reproduction and heredity
- 5-8: Regulation and behavior
- 5-8: Populations and ecosystems
- 5-8: Diversity and adaptations of organisms
- 9-12: The cell
- 9-12: Molecular basis of heredity
- 9-12: Biological evolution
- 9-12: Interdependence of organisms
- 9-12: Matter, energy, and organization in living systems
- 9-12: Behavior of organisms

4. Earth and Space Science

- K-4: Properties of earth materials
- K-4: Objects in the sky
- K-4: Changes in earth and sky
- 5-8: Structure of the earth system
- 5-8: Earth's history
- 5-8: Earth in the solar system
- 9-12: Energy in the earth system
- 9-12: Geochemical cycles
- 9-12: Origin and evolution of the earth system
- 9-12: Origin and evolution of the universe

5. Science and Technology

- K-4: Abilities to distinguish between natural objects and objects made by humans
- K-4: Abilities of technological design
- K-4: Understanding about science and technology
- 5-8: Abilities of technological design
- 5-8: Understanding about science and technology
- 9-12: Abilities of technological design**
- 9-12: Understanding about science and technology**

6. Personal and Social Perspectives

- K-4: Personal health
- K-4: Characteristics and changes in populations
- K-4: Types of resources
- K-4: Changes in environments
- K-4: Science and technology in local challenges
- 5-8: Personal health

- 5-8: Populations, resources, and environments
- 5-8: Natural hazards
- 5-8: Risks and benefits
- 5-8: Science and technology in society
- 9-12: Personal and community health
- 9-12: Population growth
- 9-12: Natural resources
- 9-12: Environmental quality
- 9-12: Natural and human-induced hazards
- 9-12: Science and technology in local, national, and global challenges**

- 7. History and Nature of Science
 - K-4: Science as a human endeavor
 - 5-8: Science as a human endeavor
 - 5-8: Nature of science
 - 5-8: History of science
 - 9-12: Science as a human endeavor**
 - 9-12: Nature of scientific knowledge**
 - 9-12: Historical perspective**

[Place an "x" in the brackets above to indicate standards covered in the program.]

Program Structure:

The workshop is designed as a full-day, with a post-workshop assignment and individual follow-up by the instructional staff. Ideal participant size is 15. The workshop design is modifiable so that this can be taught as two independent half-day workshops.

Half-day Session One

How to tell a story

- Identify parts of a story
- Critique writing samples

Half-day Session Two

How to conduct an interview

- Questioning Skills
- Resources/software tools

Assignment

- Submit a new writing sample

Session One: How to Tell a Story (3 hours)

“A way to structure my writing so that it forms a story, the hook, plot turn etc. It was a completely new way of looking at things, for me...” (Spring 2014 workshop, San Francisco, CA)

- Defining the various elements of a good story.
- Identifying the storytelling elements present in narratives such as a familiar film and in a short play
- Searching for similar narrative structures in formal science writing and journalism.
- Discussing samples of science journalistic writing using the storytelling elements as a frame of reference
- Evaluating one or two of the participants’ writing samples as a group
- Exploring various categories of journalistic science writing, such as news stories, science blogs, personal profiles, reviews of published articles and research, and science writing for academia and industry.

Session Two: How to Conduct an Interview (3 hours)

“Ask open-ended questions, really listen and react to the interviewee to discover stories you might not have expected. ” (Spring 2014 workshop, San Francisco, CA)

- Defining the elements of a good interview
- Developing effective preparation and questioning techniques
- Identifying strategies and technical tools to improve note-taking during an interview
- Recognizing main topics from an interview to incorporate into appropriate forms of journalistic writing
- Applying basic interviewing skills by interviewing an invited scientist and other participants during breakout sessions

The Assignment: The post-workshop assignment will help participants focus their writing on one of the forms of journalistic science writing, practice the skills learned in the workshop and contribute to their professional portfolio. To complete the workshop, participants will submit a writing project for review and possible publication.

Table of Contents

General Description.....	1
Program Objectives	1
Program Structure	5
Table of Contents	6
Time Required	6
Program-Specific background Information	7
Materials	7
Prior to the Workshop.....	7
Set Up.....	9
Program Delivery.....	9
Time	9
Safety	10
Session One: Key Elements of Storytelling.....	10
Critique of Writing Samples	12
Networking and Discussion about Personal Writing Experiences.....	13
Session Two: How to Conduct an Interview.....	13
Demonstrative Interview Activity.	15
Exercise: Practice Interviewing Process	17
Opportunities for Science Writing	17
Post-Workshop Assignment (optional).	19
Clean Up	20
After the Workshop.....	20
Universal Design	20

Time Required

Set-up: 30 minutes

Program: 7 hours (includes working lunch)

Clean Up: 15 minutes



Program-Specific Background Information

Definition of Terms:

CONTENT AREAS: Targeting messages for different audiences, written communication skills, observation skills, questioning skills, targeting questions for different forms of journalistic writing, constructive feedback skills

STRATEGIES: Discussion; role-play; practice in small groups; modeling interviewing skills; reflection and feedback; writing assignments.

TARGET AUDIENCE: Open to university students, post-doctorate candidates, educators, researchers & scientists who possess basic writing skills and are interested in science journalism.

RECRUITMENT: Through an application process. Because this is not intended to be an introductory writing workshop, applicants must submit a writing sample to demonstrate their basic writing skills.

COMMITMENT: Participants attend the workshop and complete the assignments.

FACILITATORS: Scientists, educators and editorial staff with knowledge of professional science writing practices, interviewing experience and excellent workshop facilitation skills; aided by support staff coached in the process and serving as small group facilitators.

PUBLIC ENGAGEMENT PLATFORMS: Opportunity to write and submit news stories, journalistic articles, blog entries, a profile of a scientist, newsletter articles, reviews of scientific events, content for web pages and press releases.

EVALUATION: Participants will evaluate the workshop upon completion to determine effectiveness of instructional strategies, usefulness of content presented and to identify areas for improvement.

Materials

This workshop requires a projector and screen, internet access for viewing short film examples during instruction, the associated PowerPoint files, application for workshop participation, reading material provided to participants prior to the workshop, printed copy of the associated articles and handouts provided during the workshop, evaluation form, a whiteboard or blackboard for the facilitator and invited guest scientist for the demonstrative interview. See detailed list of workshop materials for more information.

Prior to the Workshop (1-2 Months out)

Assignments:

Description:

In order for participants to prepare for the Workshop, they are given a number of assignments.

Assignment 1: Write an article

Assignment 2: Read an article that they receive from the instructor

Assignment 3 (optional): Read and comment on a series of materials received from the instructor

Goals:

Assignment 1: A selection of these articles will be reproduced for discussion at the Workshop

Assignment 2: This article will be discussed at the Workshop

Assignment 3 (optional):

- (a) These assignments will provide some groundwork to talk about storytelling at the Workshop;
- (b) They are sent periodically to pique the interest of the participants in anticipation of the Workshop;
- (c) They let the participants and instructors get acquainted with one another prior to the Workshop.

Materials:

Assignment 1: email #1 to participants prior to the workshop

In preparation for the Workshop, please submit by email an article based on **one** of the following prompts, due [DATE].

- (a) Profile a materials scientist/activity or write an opinion piece
Up to 600 words ([Sample 1](#)) ([Sample 2](#))
- (b) Write a news article based on newly-published research in materials
Up to 500 words ([Sample](#))
- (c) Compose an article about a materials science event, program or individual
Up to 1,500 words ([Sample](#))

Assignment 2: email #2 to participants prior to the workshop

In preparation for the Workshop, please read the attached article from the *MRS Bulletin*

- (a) “Janglin Chen’s return to Taiwan brings display vision to fruition,” Prachi Patel, *MRS Bulletin*; Beyond the Lab, Nov. 2011 v 36, p. 862-863

<http://journals.cambridge.org/action/displayFulltext?type=6&fid=8438836&jid=MRS&volumeId=36&issueId=11&aid=8438835&fulltextType=XX&fileId=S0883769411002983>

Assignment 3 (optional): email #3 to participants prior to the workshop

- (a) Following are two columns where writers explain the writing tool of “Show, Don’t Tell” – which we’re actually changing to “Show, Then Tell”. In terms of the quality of writing, for me, one of these trumps the other. See what you think.
 1. *Rusty’s Collar*, Pat Pattison, <http://www.patpattison.com/rustycollar/>
 2. *Show, Don’t Tell* by Erin, <http://www.dailywritingtips.com/show-dont-tell/>
- (b) You might ask, “First a link about songwriting, now about nature writing - what’s up? When are we going to talk about science writing?”

1. “The Greatest Nature Essay *Ever*”, Brian Doyle, Orion , Nov/Dec 2008, www.orionmagazine.org/index.php/articles/article/3649/
- (c) The film *Gravity*, starring Sandra Bullock. If you get a chance, watch the film before the Writing Workshop—we’ll be making some references to it in regards to “story telling”. It is *not* necessary to see the film for the discussion; just a suggestion. Note: We’ll make references to the film in terms of storytelling, not in terms of scientific accuracy!

Email #4: Provide background information about the invited guest scientist for everyone to be familiar with their work, research, writings and education.

- (a) As this is your opportunity to practice interviewing for various “types” of articles, whether news or a personal profile, you’re welcomed to review the attached documents to do more background research on your own. **(research about the guest speaker)**

Tips and troubleshooting:

Assignment 3(c): It may be useful to identify a recent film that participants from around the world may have easy access; it’s particularly useful if they can download it for free online. The topic should be common or well-known enough that participants from around the world can relate to.

Set Up

Time:

30 Minutes.

Set up the screen and projector. Make sure the slides are functioning and are visible throughout the space. Have handouts and evaluation forms ready to distribute. Make sure you can access the whiteboard or notepad. Participants should be seated around one large table, if possible. Set up separate area with two seats for the demonstrative interview. Room should have space for four or five small groups of 3-4 people for interviews during breakout sessions.

Program Delivery

Time:

7 hours, includes a 1 hour working lunch (optional). Refer to detailed talking points, procedures and PowerPoint slides.

- | | |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15 min. | Welcome and Introduction to the Workshop |
| 120 min. | How to Tell a Story
(Refer to separate document for talking points and procedures) <ul style="list-style-type: none">• Key Elements of Story Telling (75 min.)• Critique of Writing Samples (75 min.) |
| 60 min. | Lunch: Networking and discussion about personal writing experience |

- 30 min.** **How to Conduct an Interview**
(Refer to separate document for talking points and procedures)
- The Art of Interviewing
- 60 min.** **Demonstrative Interview Activity with guest scientist**
- Example 1: Jargon/Research interview with critique (30 min.)
 - Example 2: Not Enough Information/Outreach interview with critique (30 min.)
- 90 min.** **Exercise: Practice Interviewing Process**
- 30 min.** **Opportunities for Science Writing**
(Refer to separate document for talking points and procedures)
- 15 min.** **Post-Workshop Assignment options**
Workshop Evaluation form

Safety

None.

Key Elements of Storytelling

Time:

75 Minutes.

Description: This section provides step-by-step descriptions and demonstrations of the key elements of storytelling.

Learning Objectives:

- Identify the following elements of storytelling: the inciting incident (opening incident), the first turning point, the second turning point, and the conclusion
- Provide concrete details to enhance the writing

Materials:

1. Plot chart for writing a screenplay; example (by Syd Field): http://scripteach.com/wp-content/uploads/2010/06/Syds_Diagram.jpg
2. Knowledge of the recommended film assignment given prior to the Workshop
3. Brief cartoon film; example: *Luxor Jr.*, by Pixar
[http://www.pixar.com/short_films/Theatrical-Shorts/Luxo-Jr.](http://www.pixar.com/short_films/Theatrical-Shorts/Luxo-Jr)
4. Copies of a 10-minute play; example: “Knots,” by Lisa Soland, *The Best Ten-Minute Plays; 3 or More Actors*, Smith and Kraus Publishers (2006), edited by D.L. Lepidus
5. Example of a science-related feature article; example: “Janglin Chen’s return to Taiwan brings display vision to fruition,” Prachi Patel, *MRS Bulletin*; Beyond the Lab, Nov. 2011 v 36, p. 862-863 (given as a reading assignment prior to the Workshop)

Lesson Plan:

- (a) Describe the story telling elements while diagramming each point, based on a typical chart such as the suggested example by Syd Field. In particular, describe an opening incident, the first turning point, the second turning point, the conclusion.
- (b) Explain the story telling elements from (a) by describing where each element occurs in the film from Assignment #3(a).
- (c) Play the brief cartoon film at least twice, asking the participants to look for the elements and identify them after the film. This is done via open discussion.
- (d) Perform a seated reading of the play. Participants volunteer to play the character roles and to direct. Participants are asked to look for the storytelling elements. These elements are identified via open discussion after the reading.
- (e) Distribute copies of the feature article. Go around the room, asking each participant to read a few paragraphs aloud, and discuss certain elements of storytelling as they are recognized.

Rationale for the sequence:

- (a) The chart represents the elements of storytelling; it is the foundation.
- (b) Movies represent a very common medium for recognizing these elements.
- (c) After recognizing the elements in a standard movie, the elements become easily recognized in a short movie. The introduction of a comedy here helps break the ice among the participants and instructors.
- (d) After recognizing the story telling elements in a movie—whether a standard or a brief—the elements become more recognizable in a less-common medium such as a play. By engaging in the play, the participants may be able to “experience” the elements as they occur. Again, the choice of a comedy continues to break down inhibitions and enable a safe pathway for participants to talk openly about writing.
- (e) After recognizing the story telling elements in a less-common medium such as a play, the elements of storytelling now become visible in a journalistic science-related article.

Tips and troubleshooting:

As the participants are scientists, they are likely unfamiliar with the Workshop process of writing, so the venue may be taking them out of their comfort zone. In order to create a comfortable space to discuss openly and diplomatically about writing, comedies are suggested. When participants find themselves taking risks (“performing a play”) and laughing together, they build trust for one another, which paves the way for critiquing their writings in a Workshop setting.

Movie and play selections: Since this is for a professional setting, the selection should be of simple, commonly known topics and “neutral,” that is, void of violence, profanity and such.

Critique of Writing Samples

Time:

75 Minutes.

Description: Participants “workshop” a selection of their own writings.

Learning Objectives:

- Identify where the story telling elements exist and how they could be improved upon
- Provide a central concept to hold the article together

Materials:

Select three articles written by the participants. The selection is based on examples that best represent what everyone needs help on in their writing. This is assessed by the instructor ahead of time, from reading all of the articles.

Lesson Plan:

Article 1: Distribute copies to all the participants. Ask for a volunteer to read aloud the article, and instruct the participants to concentrate on the key elements of storytelling, or the concrete details, or another aspect of writing that the instructor determines needs to be discussed.

Do the same for articles 2 and 3.

Tips and troubleshooting:

Inform participants ahead of time that their article will be critiqued in the Workshop so that this does not come as a surprise.

At the Workshop, lay down the ground rules for critiquing: To comment with respect to the writer and to discuss what the *article* does, not what the writer does.

Let the writer listen to the article; sometimes writers may volunteer to read their own articles aloud, but *hearing* their articles enables them to notice new things about their writing. This also helps to make the critique experience less personal for the writer.

Ask questions to the participants to help direct the discussion to the key points to be addressed about the writing example, but also keep an open mind to where the discussion needs to go once it begins.

Perhaps naming some key writing challenges here to address would be helpful for someone reproducing the workshop?

Networking and Discussion about Personal Writing Experiences

Time:

60 Minutes.

Description: If lunch can be served by the Workshop, participants will stay together and network with one another and the facilitators. This provides opportunities for the participants to discuss the realm of science journalism informally and to share contact information for the future.

How to Conduct an Interview: The Art of Interviewing

Time:

30 Minutes.

Description: Participants learn about the steps for planning and conducting a successful interview.

Learning Objectives:

- Define the elements of a good interview
- Develop effective preparation and questioning techniques
- Improve interviewing skills through targeted questions
- Determine appropriate resources and techniques to capture relevant content and quotes during an interview

Materials:

How to Conduct an Interview PowerPoint slides, talking points, projector, screen and laptop.

Talking points and procedure [numbers reference slides in accompanying PowerPoint file]

1. Introduce self. Ask room – Who has conducted a journalistic interview before? Briefly talk about your experience interviewing. Give quick overview of the session.
 - The steps in the interview process
 - Demonstration interview with guest scientist
 - Critique and Q&A afterwards
2. What's the purpose of your interview? From your research, determine the purpose for conducting an interview with this person or group.
Why? To better understand the science, gather more information or clarify what you already learned.
3. Why? For information – uncover something unique that is not readily available
4. Why? For Perspective and opinions – Able to capture the speaker's voice. Short quotes are okay.
5. Why? For Context – Where does this story fit into the bigger picture
6. Why? To get additional expert opinions or personal accounts
7. Why? Remain open to new ideas for the storyline. Collecting quotes

8. Examples of possible writing assignments
9. Possible topics you might include in the article
 - Green items are things you can find out through your own research
 - Peach boxes are the reason you really have to do the interview to get a good story. These boxes are also the likely topics that you will expect to get quotes from.
10. Use your framework to identify the list of interviewees
11. Set up the interview
 - Usually get good responses (So don't be shy!) People want to promote their research
 - By direct email or phone call
 - Through media contact at university
 - Keep it brief – 30 minutes max or people may be deterred by commitment
12. The orange text emphasizes items you want to be sure to include when you reach out: where will the article be published, what's the topic you want to interview the person about, why have you selected them in particular, let them know how much of their time you need, and consider suggesting a few possible times
13. Before you begin – Learn everything you can about the person and their work/interests
 - For news articles, read the paper multiple times (including supplementary), know background info as much as possible
 - For bios, etc. do your research (find person's CV, read previous interviews, research homepage, etc.)
 - Preparation helps you to be spontaneous and follow the story
14. The following slides will describe some suggested steps to follow while conducting the interview. Recommend that the participants find what works for them and develop their own system. Being comfortable with tech/routine helps make a smooth interview
 - Describing your goals for the interview.
15. Some suggestions for tools to record an interview.
 - Practice using the software before the interview.
 - It's never a bad idea to have a backup method
16. Use of the traditional pen and paper does not mean spending your time writing everything down. Can assist by writing down the time when a good quote was made or jot down a comment that could lead to a follow-up or new question.
 - If the interview is recorded, it's not 100% necessary to capture everything. Just take the notes necessary to ask future questions, and important quotesAsk the class for other suggestions or any personal experiences with tools on the current list.
17. Steps to end the interview, make additional connections to other resources and leave the door open for follow-up questions.
18. Jump in with prepared questions that are broad, open-ended, not too specific
 - Use your questions to guide the person during the interview
19. After breaking the ice with some broad questions, begin to dig into details. Be a spontaneous, active listener.
 - Don't be afraid to ask for a simpler explanation (even if you don't personally need it) if it will help get a good, personal quote

20. Before you end the interview, clarify anything the interviewee said that was confusing or incomplete.
21. Encourage interviewees to explain in their own words or speak of the topic on a personal level to gather their story.
22. Don't ask questions that lead to short answers or conduct a discussion that allows the person to simply agree with your statements.
23. Examples of bad questions that can be reshaped into good questions.
24. Some other conversation stoppers: not allowing time for their response and not being flexible
 - Sit silently longer than you think you should. Become comfortable with silence.
 - Remember to be a spontaneous, active listener. If the interviewee says something interesting be prepared to leave plan for more interesting story
25. The interview should be a conversation, with a purpose
26. Distill the information to keep the good, remove the bad.
 - This may not be your favorite thing to do, but it has to be done.
 - Also listen to yourself on the recording and use it to evaluate your interviewing skills. Can be a confidence builder, can give insight on how to improve.
27. Explain the difference between revising, rewording and correcting speech. You trim and straighten, but you don't make it up.
28. Keep the lines of communication open after the interview concludes, even as you write and publish the article.
29. Ask for questions for the workshop participants before observing the demonstrative interview with the guest scientist.
30. This slide is the lead into the Demonstrative Interview with the guest scientist: The description of the assignment
31. List of information that the interviewer needs to collect during the interview.
32. Two phases of the interview with the guest scientist
 - Scientific Research – interviewee will not use lay terms to describe her/his work, too much jargon
 - Outreach + Value – interviewee has difficulty opening up and giving more than the minimal details about her/his experiences
33. Group Discussion: What strategies could the interviewer use to improve the two interviews?

Tips and Troubleshooting

The most important thing is to make the session collaborative. Encourage feedback from the audience. Ask questions and wait to get answers.

Demonstrative Interview Activity with Guest Scientist and Audience Critique

Time:

60 Minutes.

Description: Instructor conducts the interview, while workshop participants observe. The interview models different forms of interviews and strategies to successfully gather the necessary information for an article.

Learning Objectives:

- Apply basic interviewing skills
- Redirect a conversation back to the interviewer's intended goals
- Model a variety of interviewing techniques for difficult conversations
- Recognize main topics from an interview to incorporate into appropriate forms of journalistic writing

Materials:

Room set up for a two-person conversation, minimum of two chairs facing each other. This demonstration requires pre-planning between the instructor and the guest scientist.

Lesson Plan: Instructor conducts the interview, while workshop participants observe. The interview models two common tendencies of a scientific interviewee that make it difficult to collect good storytelling material:

1. Too much scientific jargon during a research-related interview
2. Not enough information during an informal or outreach-related interview.

Once the first interview is over, lead a discussion about the techniques used during the conversation. What did the observers see, hear or notice during the conversation? What was the outcome? Here are some general tips. Repeat the process after the second interview.

- (a) Introduce yourself & set up goals
 - *"I'm looking to write a news article for MRS, and I was hoping to talk to you to better understand your work and get some quotes for the article"*
- (b) Jump in with prepared questions
 - Start with very broad questions (*tell me important result*) and then get more specific.
 - End with broader impact questions
- (c) Actively listen!
 - This is really hard if you're writing a lot of notes, but gets easier with practice
- (d) Be prepared to change your plan based on listening
 - If interviewee says something interesting that you didn't prepare for, run with it.
- (e) Play dumb and drop your ego
 - If all your answers are specific details, you won't have any usable quotes for a general audience piece.
 - Let your subject do all the talking and explaining
 - Let them explain easy stuff to you, even if you understand. Sometimes these are the best quotes.

- (f) Sit silently longer than you think you should, so they'll try to fill that silence with more info
- (g) Be selective while taking notes
 - Write down time-stamps of good quotes
 - If you have the interview recorded, it's not 100% necessary to capture everything.
 - Take notes necessary to ask future questions, and important quotes

Exercise: Practice Interviewing Process

Time:

90 Minutes.

Description: The participants break out into groups of 3. They are given instructions to sequentially interview one another while the facilitators circulate among the different break-out groups to listen and provide guidance.

Learning Objectives:

- Improve interviewing skills to elicit desired information
- Ask questions to clarify and describe scientific information in lay terms
- Practice questioning techniques to gather more details
- Recognize main topics from an interview to incorporate into appropriate forms of journalistic writing

Lesson Plan: Have participants practice by interviewing each other.

- (a) Break into groups of three.
- (b) Assign a particular topic or focus for the interviews. Suggestions include research projects, why they decided to take the workshop, or something related to a specific event. If left open ended, they should at least determine and say out loud the topic of the interview before they start interviewing their group member. This will keep them from wandering in their questioning as the interview progresses
- (c) Have each group participant take a turn acting as interviewer, interviewee, or observer who critiques the interview afterwards, until each participant has played each role. Have Instruction team member observe each group and provide guidance to improve the interview if needed.
- (d) Stop after 20 minutes (2 rounds) for discussion.
- (e) Continue with third mini-interview.
- (f) Lead a concluding discussion to determine what the participants learned, what they found helpful, what was difficult. Share any suggestions for improvement.

Opportunities for Science Writing

Time:

30 Minutes.

Description: An introduction to possible writing careers, freelance positions and volunteer writer opportunities for science journalists.

Learning Objectives:

- Identify possible career paths in science journalism

Materials:

Opportunities for Science Writing PowerPoint slides, projector, screen and laptop.

Talking points and procedure [numbers reference slides in accompanying PowerPoint file]

1. Introduce yourself and describe your own interest in science writing—depending on whether you are a scientist, involved in formal/informal science education, or are a science enthusiast
2. Why Science Writing?
 - Pace and output: science writing allows you to dive deep into a topic for a short period of time and turn out a product quickly, whether that is a news article, press release, or profile of a scientist.
 - Socioeconomic and political aspect: science writing lets you tackle broader socioeconomic and political concepts, controversies, or outstanding questions that are caused by or benefit from scientific research.
 - Creativity: science writing lets you channel your own writing talents and voice while communicating something beyond your own activities.
3. The techniques we use to communicate depend greatly on the audience—why are you saying what you are saying, and who are you saying it to? Are you trying to convince or persuade your colleagues or your family and friends? Pitch a business idea, or defend your actions? Are you trying to inspire or educate others?
First determine your audience, and then start to write.
4. For perspective, here are the results from the (2011) Pew poll surveying the scientific literacy of American adults. Science writing is needed to help clarify topics of interest to most Americans, such as technology and healthcare.
5. Describes most science writing pieces, along with the audience and purpose.
6. Science writing lies between creative writing and technical writing. You want to be accurate about the details, but keep the reader entertained
7. If you are interested in formal science writing education, here are a few training programs you might consider, and what they (generally) offer.
8. Here are the places you might end up working as a science writer. Freelance writing is a very popular option, as you can live and work wherever you would like and work for a variety of editors.
9. [Include additional examples (good or bad) depending on the time you have and the type of science writing you want to emphasize.] Good sources are university or national laboratory press releases, popular science magazines (WIRED, MIT Technology Review).
10. What is your interest in science writing, and what motivates you in a career? (This slide is meant to start a discussion with the audience/participants).

11. Take questions from the class.

Tips and Troubleshooting

The most important thing is to make the session collaborative. Encourage feedback from the audience. Ask questions and wait to get answers.

Post-Workshop Assignment options; Workshop Evaluation

Time:

15 Minutes.

Learning Objective:

- Incorporate elements of storytelling into journalistic science writing
- Enhance written communications skills to maximize impact in the media
- Start a professional portfolio of writing samples
- Recognize main topics from an interview to incorporate into appropriate forms of journalistic writing

Materials:

Post-Workshop Assignment sheet and Science Writing Workshop Evaluation form.

Example:

By default, you will receive feedback on the article submitted to the Science Writing Workshop. You have a few other options to choose:

- a. Revise the original article (**Due _____**)
- b. Compose a new article* (**Due _____ or TBD**)
- c. Receive feedback on the original article submitted

*If you choose (b) – to compose a new article – you're welcomed to inquire with _____ for an assignment that could be considered for publication:

1. Profile a materials scientist/activity or write an opinion piece for public outreach program
Up to 600 words
2. Write a news article based on newly-published research in materials
Up to 500 words
3. Compose an article about a materials science event, program, or individual
Up to 1,500 words
4. Compose for Social Media

Clean Up

Time:

15 Minutes.

Power down the projector. Collect your materials and the evaluation forms

After the Workshop

Instructor(s) should critique the participants' articles based on the discussions that occurred during the Workshop. This would be done in writing and each file returned to the writer.

Universal Design

This program has been designed to be inclusive of participants of different ages, backgrounds, and different physical and cognitive abilities.

The following features of the program's design make it accessible:

1. Repeat and reinforce main ideas and concepts

The instruction is broken down into defined segments that relate to one core concept at a time. The participants interact through lectures, providing feedback on each other's writing, group discussions, modeling techniques and participation in small group activities.

2. Provide multiple entry points and multiple ways of engagement

Participants develop an understanding of the core writing concepts through various forms of media, including movies, plays, journalistic and scientific documents. The class practices interviewing skills through interaction with leading scientists, as well as individualized and small group practice with other participants.

3. Provide physical and sensory access to all aspects of the program

Instruction includes visual, oral and interactive components, along with modeling to present the core concepts.

To give an inclusive presentation of this program:

As above, the most important aspect of this program is creating a collaborative environment, soliciting and encouraging participants' feedback.



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