



Bill Nye: Science Guy is a feature documentary that follows the offscreen life of legendary science educator Bill Nye . A class screening of the film may supplement a science or environmental studies curriculum. Taught in conjunction with this guide Bill Nye: Science Guy will challenge students to think critically about American attitudes toward science amid the growing threat of climate change. Discussion questions and supplementary materials facilitate further research into related topics such as the scientific method, and the relationship between fact, theory and belief.

All SFFILM Education materials are developed in alignment with California educational standards for media literacy. SFFILM Education welcomes feedback and questions on all printed study materials.

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ABOUT THE FILM -USING THIS GUIDE -DISCUSSION QUESTIONS & POST-VIEWING ACTIVITIES STANDARDS ALIGNMENT MEDIA LITERACY RESOURCES SUPPLEMENTAL RESOURCES ARTICLES AND REVIEWS

USING THIS GUIDE

This study guide is intended to flexibly support educators in preparing for and following up on a class screening of **Bill Nye: Science Guy.** Support materials are intended to facilitate group discussion, individual and collaborative creative exercise, subject-based learning and access to resources for further investigation of material. Educators are encouraged to adapt and abridge the content as necessary to meet their unique learning objectives and circumstances.

ABOUT THE FILM

The effortlessly charming, bow-tie sporting scientist Bill Nye is beloved by all generations who grew up watching his show, Bill Nye the Science Guy, but his work didn't stop once the show went off the air. In his current role as CEO of The Planetary Society, Nye is working to advance founder Carl Sagan's passion project of solar sails. What free time he has he spends debating creationists and climate change deniers. In Bill Nye: Science Guy, we travel along with Nye as he examines ice cores and rapidly retreating glaciers, tours "troubling" biblical theme parks, and visits a convention of science teachers, where he can barely take two steps without a request for a selfie. Filmmakers (and fans) David Alvarado and Jason Sussberg capture candid moments with a man who admits that fame has likely changed him, but who unquestionably strives, on a daily basis, to make the world a better place through science advocacy and education. Science rules!

Directed by Jason Sussberg and David Alvarado USA 2016, runtime 90 min English Grades 7-12

Recommended Subject Areas:

Environmental Science Ethics/Religion Journalism Math Political Science Science World Affairs





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DISCUSSION QUESTIONS PRE-VIEWING TOPICS AND DISCUSSION:

To prepare for a class screening of **Bill Nye: Science Guy**, remind students what is the scientific method. How do scientists come to conclusions? What is the meaning of an accepted theory? You can refer to the Supplemental Resources section of this guide for support materials.

The film contains a contentious debate between Bill Nye and Creationist entrepreneur Ken Ham. In order to tread

gently around students' religious beliefs, you might follow your discussion of the scientific method with a classroom conversation or a journaling activity about the relationship between religion and science.

- Is it possible to believe in both science and religion?
- How can we respect religious beliefs while also acknowledging science?

POST-VIEWING DISCUSSION: Character and Story

1) Describe Bill Nye.

- How is Bill's television persona different than his offscreen personality?
- How did Bill connect with his viewers? Why did his show become so popular?
- How did popularity change Bill?
- How does he balance his life onscreen and offscreen?

2) Describe Bill Nye's family.

- What was Bill's mother like? What kind of an example did she set for her children?
- What is Bill's relationship with his siblings?
- How did Ataxia, the muscle disease that is genetic in Bill's family, shape his experience as a child and as an adult?
- How did Bill's family's experience with illness contribute to his passion for science?

3) During the course of the film, Bill Nye encounters some adversaries. How would you characterize his debate partners, Ken Ham and Joe Bastardi?

- What is Bill's goal in confronting Ham and Bastardi?
 - How do Ham and Bastardi each respond to Bill Nye?

• How are these men alike and how are they different?

• Do you think that either of these men will change his mind about the age of the earth or climate science? Why or why not?

4) How does Joe Bastardi's son Garrett respond to Bill Nye?

- How would you describe Garrett? Is he like or unlike people that you know?
- How does Garrett react to his father's views about climate change?
- How does Garrett react to Bill's views about climate change?
- How do you think Garrett felt when he sat in on the class where Bill Nye presented on climate science? Why do you think he left the room?
- Do you thinK Garrett will change his mind about the science surrounding climate change?
- Have you ever changed your mind about something that resulted in your disagreeing with one of your parents? How did that experience feel?







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Context

1) What does Bill mean when he says that America is becoming "anti-science"?

- What cultural movements and trends is Bill referring to?
- Have you seen evidence of anti-scientific thinking in American culture?
- Why is science important? What does science contribute to human society?
- Why do you think there is such a powerful campaign against science in the United States?
- What interests are threatened by science?
- What can citizens do to combat the proliferation of anti-scientific thinking?

2) What is the scientific method?

- How do scientists come to conclusions? What processes do they use?
- What is a fact and what is a theory? What does it mean to say that evolution is an accepted scientific theory?
- What is the scientific community?
- How does a theory become accepted in the scientific community?

3) How is belief in climate change different than belief in God?

- How does the meaning of belief change if you are talking about religion or data? Are both of these kinds of believing valid?
- How does science approach the unknown, as Bill says, the great mystery of the beginning of the universe?
- How does religion approach that mystery?
- Is it possible to believe in both science and religion?

How can these two kinds of believing make room for each other? Should they have to?

4) Why do people doubt climate science?

- Why is it so difficult for non-scientists to trust the science surrounding climate change?
- What other interests are at stake for climate deniers?
- What strategies do climate deniers use to cast doubt on the science?
- How does the scientific method debunk their efforts?

Style and Message/Reading the Film for Media Literacy

1)What did you think of this film?

- What issues did this film address?
- Which parts of the film were most interesting to you?

• Did learn anything from watching this film?

2) How is being a science educator or a TV personality different than being a scientist?

- What is the role of an educator and what is the role of a scientist?
- How do educators-- whether in the

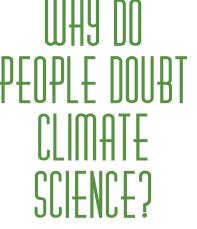
classroom or on TV-- support the work of scientists in the field?

• Why is it important for the public to understand science?

3) Bill goes into enemy territory to confront science deniers. What is his goal in debating the science-deniers?

- In what ways is he successful and in what ways does he fail in achieving his goals?
- Do you think that people can change their minds through debate and conversation?
- What makes people change their minds?
- Do films and TV programs play a role in changing people's minds? How so?







CLASSROOM GUDĘ

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POST-VIEWING ACTIVITIES:

1) Engage the class in an activity to explore and form opinions about climate change. In this lesson from PBS NOW, students work in small groups to research climate science and to develop opinions.

http://www.pbs.org/now/classroom/globalwarming.html

2) Become a science educator yourself!

Working in small groups of three or more, students choose a scientific subject to explore in a five-minute TV show.

Design an experiment that you can carry out in less than five minutes.

Write a script that explains the experiment, what it proves, and what it can teach your audience. Connect your experiment to larger scientific concepts.

Using a smartphone camera, film the experiment while reading the script. One student acts as cameraperson, one student does the experiment, and one student reads the script.

Voila! Share your science education program with the class.







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California Media Literacy Standards Addressed In This Lesson:

- Grade 7: Standard 1.8 Analyze the effect on the viewer of images, text, and sound in electronic journalism; identify the techniques used to achieve the effects in each instance studied.
- Grade 8: Standard 1.9 Interpret and evaluate the various ways in which visual image makers (e.g., graphic artists, illustrators, news photographers) communicate information and affect impressions and opinions.
- Grades 9 & 10: Standard 1.14 Identify the aesthetic effects of a media presentation and evaluate the techniques used to create them (e.g., compare Shakespeare's Henry V with Kenneth Branagh's 1990 film version).
- Grades 9 & 10: Standard 1.2 Compare and contrast the ways in which media genres (e.g., televised news, news magazines, documentaries, online information) cover the same event.
- Grades 11 & 12: Standard 1.1 Recognize strategies used by the media to inform, persuade, entertain, and transmit culture (e.g., advertisements; perpetuation of stereotypes; use of visual representations, special effects, language); Standard 1.3 Interpret and evaluate the various ways in which events are presented and information is communicated by visual image makers (e.g., graphic artists, documentary filmmakers, illustrators, news photographers).

For more information about media literacy standards in your state, visit:

- MediaLiteracy.com: resources for advancing media education, United States Standards for media literacy education. http://www.medialiteracy.com/standards.htm
- Frank W Baker's guide to State Standards Which Include Elements of Media Literacy. http://frankwbaker.com/ state_lit.htm

Common Core Standards Addressed In This Lesson:

This lesson addresses the English and Language Arts standards for Reading Informational Texts grades 9-12. Additional specific standard applications are listed below:

- CCSS.ELA-Literacy.RL.11-12.2 Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text.
- CCSS.ELA-Literacy.RL.11-12.3 Analyze the impact of the author's choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).
- CCSS.ELA-Literacy.RI.11-12.3 Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.





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MEDIA LITERACY RESOURCES

SCREENING WITH MEANING

We live in a world where technology mediates a large portion of human interaction and the exchange of information. Every projected image, every word published on a page or a website, and every sound from a speaker reaches its audience through the medium, through the language of the device. The ability to parse the vast array of media messages is an essential skill for young people, particularly in a mainstream commercial culture that targets youth as a vulnerable, impressionable segment of the American marketplace. Most students already have a keen understanding of the languages different media use and the techniques they employ to inspire particular emotions or reactions, but they often lack the skill or awareness to fully deconstruct the messages they continuously receive. Analysis of a media message—or any piece of mass media content—can best be accomplished by first identifying its principal characteristics:

(1) Medium: the physical means by which it is contained and/ or delivered

(2) Author: the person(s) responsible for its creation and dissemination

(3) Content: the information, emotions, values or ideas it conveys

(4) Audience: the target audience to whom it is delivered

(5) Purpose: the objectives of its authors and the effects of its dissemination.

Students who can readily identify these five core characteristics will be equipped to understand the incentives at work behind media messages, as well as their potential consequences. Media literacy education empowers students to become responsible consumers, active citizens and critical thinkers.

CORE CONCEPTS OF MEDIA			
A	AUDIENCE		
F			
		What effect does the message have on the audience it reaches, if any?	





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THE NON-FICTION FILM WHAT IS A DOCUMENTARY?

A documentary is a film whose goal is to capture truth, fact or reality as seen through the lens of the camera. But there are many kinds of documentaries, and not everyone's idea of truth is the same. The Scottish filmmaker John Grierson coined the term "documentary" in 1926 to describe American filmmaker Robert Flaherty's romanticized culture studies, but nonfiction filmmaking dates back to the earliest motion picture reels.

The definition of documentary expanded as filmmakers experimented with technology and the goals of nonfiction. Avant-garde documentarians, like Dziga Vertov in the 1920s, believed that the mechanical eye of the camera gave a truer image of reality than the human eye and pointed his lens at newly industrialized cities. Leni Reifenstahl's propaganda films from Nazi Germany used the nonfiction form to convey a political message, a slanted truth. The international cinema vérité or observational movements of the 1960s attempted to remove authorship from the documentary. The observational filmmaker hovered like a "fly on the wall" watching the world without commentary. Modern documentaries often seek to raise awareness about a social, environmental or political issue, guiding their audiences toward civic participation and activism.

While watching a documentary, it is important to remember the core concepts of media analysis: who made the film, for what audience and why? The nonfiction format can be deceptively subjective, as all filmmaking involves an inherent selection process: in the images that are shot, the music and narration that accompanies them and, most significantly, the way in which they are all edited together. Media literacy means always analyzing a documentary for its message and authorial intent.

A BRIEF TIMELINE OF THE DOCUMENTARY

1895 The Lumiere brothers developed the first motion picture film reels, capturing brief, unedited clips of life around them called "actualities" (e.g., Train Arriving at the Station)

1900 - 1920 Travelogue or "Scenic" films became popular, showcasing exoticised images from around the globe.

Ig26 John Grierson coined the term "documentary" to describe Robert Flaherty's romantic nonfiction film, Moana.

Ig29 Dziga Vertov, with the Soviet Kino-Pravda movement, released the experimental nonfiction film, Man With a Movie Camera.

1935 Leni Reifenstahl released Triumph of the Will, the infamous propaganda film that chronicled the 1934 Nazi Party Congress.

IJJJ John Grierson collaborated with the Canadian government to form the National Film Board of Canada, with the initial goal of creating Allied propaganda in support of the war.

ISENT The cinema vérité movement began in Europe, shortly followed by "direct cinema" in the

U.S. Portable cameras and sync sound allowed filmmakers to capture intimate footage with minimal intervention.

1968 The Argentine film, La Hora de los Hornos (The Hour of the Furnaces) opened the door to the activist cinema of the 1970s, which used film as a tool to counter capitalist and neo-colonial politics in Latin America.

The US Congress mandated that the US government support the creation of independent non-commercial media, and the Independent Television Service (ITVS) was founded.

2000S The widespread use of digital cameras and editing software made the documentary medium vastly more affordable to independent and amateur filmmakers. Video sharing sites such as YouTube and Vimeo allowed amateur filmmakers to broadcast their work.

PRESENT DAY The term "documentary" has come to encompass a wide range of nonfiction cinema. Contemporary filmmakers continue to push the boundaries of truth in film and to explore new avenues and applications for the medium.





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THE MAKING OF A DOCUMENTARY

Idea, Issue, Story.

Even though they are nonfiction films, most modern documentaries structure their content around a traditional story arc, with a beginning, middle and end, as well as characters, and a conclusion, theme or thesis to impart to the audience. Documentary filmmakers begin their projects with an idea or an issue that they wish to explore more deeply. Through research and planning, they develop a comprehensive plan before they begin shooting.

The Production Process.

To capture candid moments on film, modern documentary makers often leave the camera running, collecting far more footage than the final film requires. They may do this during interviews or in observationalstyle encounters with their subjects. To get increased access and an observational aesthetic, documentary makers often use handheld cameras and natural light, rather than staging a more formal filming environment.

Post-Production and the Documentary.

Because a documentary film relies upon candid footage, a large part of the film's construction occurs in the editing room, where you work with what you've captured. A documentary editor will sift through long interviews just to find a few phrases that will summarize the film's message. To emphasize important points and build the story, some documentaries use a voiceover, an interview or a scripted narrative that brings candid footage together into a coherent statement. An original score can work alongside the voiceover to unify the footage and shape the mood of the film. Audiences often underestimate the power of sound to generate an emotional response. Many documentaries also use charts, graphs and historical footage to add context and emphasize key points.

Distribution.

Once a film is completed, the filmmaker needs to help it find its audience. Many documentaries are made independently on small budgets, but what's the point of all your work if no one hears your message? Some documentaries will be released in theaters around the country or get programmed on public or cable TV channels, but most documentary filmmakers will start by submitting their work to film festivals, in hopes of attracting distributors for the theater and television markets. Filmmakers may also make their films available online and use social media to reach their target audience.







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SUPPLEMENTAL RESOURCES

Lesson Plans About the Scientific Method

Flocabulary https://www.flocabulary.com/lesson-scientific-method/

Biology Corner https://www.biologycorner.com/lesson-plans/scientific-method/

Ataxia and Talking About Illness in the Classroom

Ataxia.org http://www.ataxia.org/learn/ataxia-diagnosis.aspx

We Are Teachers: How to talk with students when a classmate is diagnosed https://www.weareteachers.com/talk-students-illness-classmate-diagnosed/

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Climate Change Resources

The New Yorker http://www.newyorker.com/tech/elements/space-climate-change-and-the-real-meaning-of-theory

PBS NOW

http://www.pbs.org/now/classroom/globalwarming.html

The EPA https://www3.epa.gov/climatechange/kids/resources/lesson-plans.html

NYTimes Learning Blogs https://learning.blogs.nytimes.com/teaching-topics/global-warming/?_r=0

Our Climate Our Future

https://ourclimateourfuture.org/learn-more?gclid=Cj0KEQjwtu3GBRDY6ZLY1erL44EBEiQAAKIcvoIRHCKKKCPVQdMNAhqYU Rky0IqUXNLW-fJfLBVYB5IaAqF48P8HAQ





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REVIEWS

Hollywood Reporter

3/16/2017 by Michael Rechtshaffen

This doc that screened at SXSW is an engaging portrait of the man behind the lab coat. No more Mr. Nice Science Guy?

With his beloved PBS series having officially wrapped back in 1998 (although still playing in perpetuity on TV and classrooms everywhere), Bill Nye finds himself at a career crossroads.

While his trademark bow tie is still very much intact, his struggle to be taken seriously as a passionate advocate for the environment, facing off against dismissive climate change deniers and the anti-science movement, is intimately chronicled in the documentary Bill Nye: Science Guy, which had its world premiere at South by Southwest.

Wherever he travels, Nye, now 61, is greeted by a barrage of delighted, selfie-taking millennials who grew up with his show, which combined his loves of science and wacky comedy.

But he's finding that his approachably light-weight reputation can be a bit of a hindrance when attempting to sound the alarm on serious real-world issues.

Although Nye has the support of many in the scientific community, like Neil deGrasse Tyson, who endorsed him as CEO of the Carl Sagan-co-founded The Planetary Society, others, such as weather forecaster and global-warming contrarian Joe Bastardi, question the legitimacy of an "actor playing a scientist on TV." Then there's creationist-entrepreneur Ken Ham, who was able to turn publicity generated from a 2014 debate with Nye into a substantial fundraiser for his anti-science Ark Encounter theme park.

Co-directors David Alvarado and Jason Sussberg, who had previously brought their anti-aging documentary, The Immortalists, to SXSW in 2014, effectively chart their affable subject's trek from mechanical engineer to renowned Science Guy to passionate defender of the planet.

Nye's openness extends to a clear-eyed examination of his personal life — one which has often taken a back seat to his career pursuits, impacting his ability to sustain meaningful relationships.

Also very much on Nye's mind is Ataxia, a genetic disease of the nervous system affecting fine motor control that has been passed down by his father to his two siblings but, in his case, has so far not shown signs of progression.

The 2013 Dancing With the Stars contestant may be in the process of attempting to bulk up his professional persona, but watching the expression on his face change from concern to goofy enthusiasm during a recent successful test launch of Sagan's dream project, the solar-powered LightSail spacecraft, it's unlikely he'll be going anywhere soon.

Variety

Joe Leydon

The beloved TV host strives to be taken seriously in his battle against anti-science forces.

"Bill Nye: Science Guy" is an efficiently thought-provoking study of what it means to be a rational and analytical advocate





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for science in an age when deniers of evolution and climatechange often seem to have higher profiles, deeper pockets and louder voices. But it's even more interesting as the story of a beloved celebrity who wants to reinvent himself, to be taken more seriously — by longtime admirers and philosophical adversaries alike — even as he takes advantage of his pop-culture prominence to reach the masses with his messaging.

Directors David Alvarado and Jason Sussberg ("The Immortalists") offer a sympathetic yet balanced view of their subject, 62-year-old Bill Nye, star of the long-canceled but enduringly popular "Bill Nye the Science Guy," a kid-friendly TV series that provided informal and entertaining scientific demonstrations for generations of viewers much too young to remember the similarly ambitious "Watch Mr. Wizard." Although PBS ended the series back in 1998, it has enjoyed a long afterlife in reruns, classrooms, and the minds of nostalgic fans. Illustrative clips of Nye's appearances at book-signings and other events testify to the warm esteem he continues to elicit from thousands who grew up with him as their televised tutor.

If you look closely at those clips, however, you can't help noticing Nye isn't entirely at ease with adulation. (He often responds to selfie requests with an impatience that borders on brusqueness.) "Bill Nye: Science Guy" hardly qualifies as a warts-and-all expose of the private man behind a public persona. But it does suggest the extent of a reflexive standoffishness that, as Nye himself readily admits, stems from memories of his unhappy childhood, and fears that, like his brother and sister, he might be stricken by Ataxia, a crippling neurological disease that runs in his family. So far, he's shown no sign of the malady — but he identifies it as the reason why he's never married and fathered children. Well, at least one of the reasons.

On the flip side, Nye often appears positively buoyant whenever he speaks of his work as CEO and official face of The Planetary Society, an organization co-founded by his idol and mentor, the late Carl Sagan, and dedicated to fulfilling Sagan's dreams for a solar-powered LightSail spacecraft. And although he comes close to losing his temper a couple times during live and televised debates with people he considers dangerously anti-science like Ken Ham, an aggressive creationist who raised money for a Noah's Ark theme park by cannily exploiting viral videos of his public exchanges with Nye — he's by and large a happy warrior when it comes to making the case for his side of the issues.

The catch is, while celebrity scientist Neil deGrasse Tyson definitely qualifies as a pro-Nye guy, others in the scientific community have openly criticized Nye for drawing attention to contrarians such as Ham and Joe Bastardi, the latter a TV weather forecaster (and, oddly enough, champion bodybuilder) who routinely mocks Nye's dire predictions of global warming. Others pointedly note that the Science Guy isn't really a scientist at all — he actually holds a degree in mechanical engineering — and accuse him of being a mere pretender who has successfully packaged himself as an affably telegenic expert known for his infectious good humor and snazzy bowtie.

Based on what we see of Nye in this beguilingly absorbing documentary, however, it appears the naysayers have done little to temper his determination. The final portion of "Bill Nye: Science Guy" focuses on faint early signs that he's starting to bring an outspoken critic around to his point of view. It's a hopeful sign, to be sure, but the filmmakers don't push too hard in the direction of a neatly tied-up happy ending. They, and Nye, fully understand that conversion, like self-reinvention, is a process that takes time.

