



STEAM Challenge
Digital Storytelling Unit
*Water Corruption: Special Investigative
Report*
(Community Engagement)

Designed for Middle and High School Students

Table of Contents	Range of Activities
<ul style="list-style-type: none">• Introduction• The Challenge• Process• Meridian Support Resources• Evaluation Rubric• Essential Questions• Student Proficiencies• Curricular Correlations	<ul style="list-style-type: none">• Research and Analysis: Physical Characteristics of Local Water Supply• Scientific Projection• Creative Brainstorming – Scenario Development• Scriptwriting• Digital Literacy Skills - Video - Pre-production, Production and Post-production• Human Skills: Creativity, Collaboration, Critical

Introduction

This Digital Story Telling Challenge will take two to four weeks to complete. This Challenge targets key Human Life Skills – creativity, collaboration, critical thinking, digital literacy, and presentational skills – in equal measure with the curricular content. Delivering on all those learning goals requires student immersion and time. The results, as based on our research, are a high level of student engagement, deep learning, and 100% teacher endorsement.

The following Challenge:

- Should be completed by collaborative teams of two to four students but can be completed independently, if desired.
- Is aligned to nationally recognized Curricular Standards.
- Contains an Evaluation Rubric that allows the teacher to clearly score and appraise the students' work.
- Is designed to be integrated into the classroom in alignment with existing curricula.
- Can be assigned as an extra credit project to teams of students that you think would benefit from this kind of immersive, deep learning experience. Additionally, will work well in informal educational settings.
- Should follow the rules of Digital Citizenry in their proper usage and/or citation of images, music and text taken from other sources. See the Digital Rules area in the free Media Resources section of the Meridian Stories site for guidance.

The [Media Resources](#) section also contains many other **free support materials** from short videos featuring professionals in the field – Artists and Innovators– to short written documents that cover everything from storyboarding to creative brainstorming, interviewing techniques to game design.

While it is helpful to have a Technology Integrator involved, they are not usually necessary: the students already know how to produce the media. *The teacher's*

primary function in these Challenges is to guide the students as they engage with the content. You don't need to know editing, sound design, shooting or storyboarding: you just need to know your content area.

At the end of the Challenge, it is often fun and useful to have a screening of all the media productions – they are all designed to run under 4 minutes each. Students can vote for their favorite videos that can then be screened in a larger assembly-like setting for the whole grade to see. Or this work can be presented as part of a student showcase for parents and friends. Presentational Skills is another Human Life Skill that this project enables.

Our research indicates this to be a really useful exercise for two additional reasons:

1. Students actually learn from their peers' presentations – it is useful to hear a perspective that is not just the teacher's; and
2. The public setting – painful as it is for some students – provides them with an opportunity to 'own' their work and to be more accountable.

Finally, if you are interested to learn more about the community of schools who annually participate in the [Meridian Stories Competitions](#) – a community that is characterized by a friendly competitive spirit; feedback from Mentors on each submission; and the rewarding of digital badges in content, storytelling and digital literacy – please return to the Competitions section of the website or inquire at info@meridianstories.com.

Let's get started.

The Challenge

Your town's public drinking water supply is being threatened and there is a crisis. Your challenge is to create a television news segment investigating the crisis and what can be done. Here is what your team needs to do:

1. Research your municipal water supply.
 - a. Where does it come from? Get specific about your local source: Is it an aquifer? River? Lake? Reservoir?
 - b. How clean is it? Is the water treated before it is distributed to local homes and businesses? How, and for what?

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- c. How is the source recharged? That is, where does the water come from: is it an aquifer that is recharged by rainfall? Is it a stream or river whose water level is influenced by precipitation runoff in the watershed? Is it a lake or reservoir that receives water from rivers and streams, rainfall, and the water table?
2. Identify the greatest real potential threat to your water. How vulnerable is your water supply.
 - a. The threat may be contamination – trains carrying pollutants travel a rail line that crosses the reservoir; an accident from nearby industry leaks pollutant(s); residential and commercial development weakens the watershed’s ability to naturally purify runoff, resulting in deteriorated water quality.
 - b. Or, the threat may be to available water quantity. For example, the water company is concerned that the supply will become limited as the average annual rainfall in your area declines, as has been the trend in recent years in some parts of the country. Will demand exceed available supply? Demand has many faces: industrial use, irrigation for agriculture, an expanding urban population center, or increasingly, corporations pumping clean water to bottle and sell elsewhere.
3. Now assume the threat *is* happening, and a crisis is unfolding. Create a 2-4 minute Special TV News Report about this crisis that features your news team covering the events taking place.
4. In the end, your report must cover the following four areas:
 - a. Where your municipal water comes from;
 - b. The current threat and its impacts (how many people without potable water, ecological repercussions);
 - c. What *could* have been done to anticipate and prevent it; and
 - d. What is being done now to minimize the problem?

Deliverables include:

- Special Report Video
- Five Stage Outline (at teacher’s discretion)
- Shooting Script (at teacher’s discretion)

Process

Below is a suggested breakdown for the students' work.

During Phase I, student teams will:

- Research, using a variety of sources, from where your town's drinking water supply comes.
- Research, using a variety of sources, the mechanics of your water supply, including how the water is moved from the source to the home; how it is cleaned or purified; and how it is re-charged.
- Given the above information, research and brainstorm the potential threats to your water supply
- Given all the information that has been gathered, develop the outlines of the narrative that your team wants to tell: a narrative that includes: a) the facts about your community's water supply; b) the realization of the water corruption threat; c) details of what could have been done to prevent this threat from happening; d) what is the current impact; and e) what is being done to mitigate the impact of the corrupted water supply.
 - *Teacher's Option:* Five Stage Outline – Teachers may require that teams hand in an outline paper detailing the five stages outlined above.

During Phase II, student teams will:

- Turn the outline into a script.
 - This Challenge encourages the team to pay close attention to the news format. Your team can, for example, choose to report this as hot-off-the-press news that is responding to a crisis in the making, or as an investigative report that is revealing to the public why people are getting sick in the town. In both cases, pay attention to those genres' emphasis on drama, sleuthing, crisis reporting, use of subject matter experts, culpable parties and victims.
 - Also, pay attention to the personalities of the reporters and on-air talent: you may want to set this up with a studio news anchor, an on-the-scene investigative reporter and a subject-matter expert. There are many ways to

tell this story and choosing the most dramatic approach is part of the challenge.

- Fact Checking: Once you have started scripting, be sure to review the accuracy of your science. Is all the research that you have done accurately represented in your fictional script? How have you visually documented your research?
- Create a storyboard of the video.
- Cast the video.
- Finalize the script.
 - **Teacher's Option:** Shooting Script – Teachers may require that teams hand in their Shooting Script.
- Pre-produce the video:
 - Scout locations for shooting;
 - Create costumes and props and other set pieces, as needed;
 - Prepare the logistics for the actual shooting of the video; and
 - Rehearse the video.

During Phase III, student teams will:

- Shoot the video.
- Edit the video, adding stills and graphics as desired.
- Post-produce the video, adding music and sound effects as desired.

Meridian Support Resources

<p><i>Meridian Stories</i> provides two forms of support for the student teams:</p> <ol style="list-style-type: none"> 1. <u>Meridian Innovators and Artists</u> – This is a series of three to four minute-videos featuring artists and innovative professionals who offer important advice, specifically for Meridian Stories, in the areas of creativity and production. 2. <u>Media Resource Collection</u> – These are short documents that offer student teams key tips in the areas of creativity, production, game design and digital citizenry. <p>Recommended review, as a team, for this Challenge include:</p>	
<p>Meridian Innovators and Artists</p>	<p>Media Resource Collection</p>
<p><i>On Interviewing Techniques</i> – Tom Pierce <i>On Acting for Film and Stage</i> – Janet McTeer</p>	<p>“Using Social Media as a Research Tool” “Sound Recording Basics” “Digital Rules: The Starting Line”</p>

<p><i>On the Importance of Character in Storytelling</i> – Scott Nash <i>On Nonfiction</i> – Margaret Heffernan</p>	<p>“Video Editing Basics”</p>
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Evaluation Rubric – *Water Corruption: Special Report*

CONTENT COMMAND			
Criteria	1 – 3	4 – 7	8 – 10
Community Research	The research from the community is not substantive	The research from the community is adequate	The research from the community is substantive and persuasive
Communication of Content – Ecosystem Resilience	Understanding of ecosystem resilience is not evident and/or is presented inconsistently	A basic understanding of ecosystem resilience is evident	A thorough understanding of ecosystem resilience is evident
Communication of Content – Ramifications	The ramifications of ecosystem disturbance not clearly presented or unlikely	The ramifications of ecosystem disturbance are evident and plausible	The ramifications of ecosystem disturbance are thoroughly developed, and clearly communicated
Content Command: Prevention and Response to Crisis	The steps to prevent and respond to the crisis seem inconsistent with the given scenario	The steps to prevent and respond to the crisis are clear and plausible	The steps to prevent and respond to the crisis are exceptionally insightful and plausible
STORYTELLING COMMAND			
Criteria	1 – 3	4 – 7	8 – 10
Script	The narrative is hard to follow and/or the scripting is lackluster and ineffective	The narrative is presented clearly, but the scripting is inconsistently engaging	The narrative is presented clearly and the scripting is engaging and effective
Character	The characters – reporters, interviewees and other -- are not particularly imaginative or compelling	The characters – reporters, interviewees and other -- are interesting	The characters – reporters, interviewees and other -- are very compelling

Media Format – TV News Report	The Special News Report does not demonstrate clear understanding of the television news format	The Special News Report shows clear understanding of the television news format	The Special News Report shows thoughtful understanding of the television news format
MEDIA COMMAND			
Criteria	1 – 3	4 – 7	8 – 10
Acting	The acting lacks coherence and discipline for the narrative to be effective	The acting is adequate and clear	The acting is entertaining and engaging and contributes to the narrative’s success
Editing	The overall editing and pacing do not effectively capture the drama inherent in the story	The editing and pacing captures the drama inherent in the story	The editing and pacing enhance the drama inherent in the story
HUMAN SKILLS COMMAND			
Criteria	1-3	4-7	8-10
Collaborative Thinking	The group did not work together effectively and/or did not share the work equally	The group worked together effectively and had no major issues	The group demonstrated flexibility in making compromises and valued the contributions of each group member
Creativity and Innovation	The group did not make a solid effort to create anything new or innovative	The group was able to brainstorm new and inventive ideas, but was inconsistent in their evaluation and implementation of those ideas	The group brainstormed many inventive ideas and was able to evaluate, refine and implement them effectively
Initiative and Self-Direction	The group was unable to set attainable goals, work independently and manage their time effectively	The group required some additional help, but was able to complete the project on time with few problems	The group set attainable goals, worked independently and managed their time effectively, demonstrating a disciplined commitment to the project

Essential Questions

1. From where does your local water supply come?
2. What aspects of an ecosystem lend it resilience?
 - a. What aspects of an ecosystem make it vulnerable to natural or human induced disturbances or hazards?
3. Why are some ecosystems stable, and are therefore more resistant to accidents or disturbances? Compare the relationship of non-human organisms to the ecosystems in which they reside, to that of humans and their ecosystems.
 - a. What does it mean to have significant, even controlling influence, over ecosystems?
4. How do you know the ramifications and fluctuations caused by your natural or human-induced disturbance are plausible?
 - a. What did you learn about the safety, protection, and long-term stability of your local drinking water supply?
5. What are the basics of video production and, specifically, the genre of investigative reporting?
6. How has working on a team – practicing one’s collaborative skills - changed the learning experience?

Student Proficiencies

1. The student will know from where their local water comes.
2. The student will gain a deeper awareness of natural ecosystems’ ability to withstand the wide-reaching repercussions of disturbance.
 - a. The student will gain a deeper understanding of the relationships between human populations and natural resource use, dependency, and extraction.
3. The student will gain a deeper understanding of the resilience of ecosystems to a wide variety of natural or human-induced disturbances.
4. The student will become familiar with the sources and vulnerabilities of the drinking water supply in their community
5. The student will know the basic constructs of using video media to effectively communicate information and a story, and will understand the basic constructs of television news reporting.

- a. The student will understand the processes involved in researching content from a variety of sources including the local water utility; selecting relevant information from those sources; and organizing this information in a way that yields narrative cohesion and scientific accuracy.
6. The student will have an increased awareness of the challenges and rewards of team collaboration. Collaboration – the ability to work with others - is considered one of the most important 21st century skills to develop in students as they prepare for life after secondary school.

Curricular Correlations

This *Water Corruption: Special Report* Challenge addresses a range of curricular objectives that are articulated in the **Next Generation Science Standards**. Below please find the standards that are addressed, either wholly or in part, in this challenge.

Next Generation Science Standards (NGSS)

High School – Earth and Human Activity

Students who demonstrate understanding can:

- Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (HS-ESS3-1)

Disciplinary Core Ideas:

- Resource availability has guided the development of human society. (HS-ESS3-1)
- All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors. (HS-ESS3-2)
- Natural hazards and other geologic events have shaped the course of human history; [they] have significantly altered the sizes of human populations and have driven human migrations. (HS-ESS3-1)
- The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources. (HS-ESS3-3)
- Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation. (HS-ESS3-4)
- Though the magnitudes of human impacts are greater than they have ever been, so too are

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- human abilities to model, predict, and manage current and future impacts. (HS-ESS3-5)
- Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution, which can be addressed through engineering. These global challenges also may have manifestations in local communities. (HS-ETS1-1)

Middle School – Earth and Human Activity

Students who demonstrate understanding can:

- Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment, and analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. (MS-ESS3-3, MS-ESS3-2)

Disciplinary Core Ideas:

- Humans depend on Earth’s land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1)
- Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth’s environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3)
- Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3, MS-ESS3-4)
- Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth’s mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)

Other Plausible Core Curricular Correlations

Depending on what the student teams choose to focus on for their examples, they may also cover the following topics:

- LS2 Ecosystems: Interactions, Energy, and Dynamics
- ETS1 Engineering Design