EDUCATION @ MESA ARTS CENTER

NATIONAL GEOGRAPHIC LIVE!
BERTIE GREGORY: A WILD LIFE

Ikeda Theater | January 24 | 10:15 AM | Grades: 3 - 8

2018/2019 EDUCATOR RESOURCE GUIDE

EDUCATION @ MESA ARTS CENTER

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ABOUT BERTIE GREGORY, FILMMAKER…

National Geographic Live! brings you Bertie Gregory, a 24-year-old British wildlife photographer, filmmaker, and presenter. Immediately after graduating with a degree in zoology, Bertie set off on an adventure to Mumbai with respected National Geographic photographer Steve Winter. This task of filming urban and jungle leopards while with Steve Winter proved to be just the type of work Bertie Gregory excels at. Bertie's work on the leopard project became a film special that aired on Nat Geo WILD and was soon followed by a 16 episode series called wild_life with Bertie Gregory. This series focused on Vancouver Island and the elusive coastal wolf. Bertie also follows the activities of bald eagles, bears, sea lions, and sea otters in this entertaining and visually captivating series.

Bertie has always had a fascination with wildlife and at the young age of 10 would sneak his father's camera to take pictures of the local wildlife in the south west England countryside. But Bertie was even able to find wildlife in the urban setting when he was tasked with finding wildlife to photograph in London as part of the UK 2020 Vision Project when he was 16. By capturing stills of foxes, red deer, squirrels, and the powerful peregrine falcon in the city, Bertie showed there is wildlife every where. With his lively, enthusiastic personality, Bertie Gregory is sure to make this wildlife presentation by National Geographic Live! as absolutely entertaining as possible!

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WELCOME!

Dear Educator,

Thank you for selecting a **National Geographic Live!** field trip with the Mesa Arts Center. We have a dynamic season planned and we look forward to connecting you to our many speakers and presentations. With National Geographic Live, students are able to experience dynamic presentations and make educational connections well beyond the classroom.

We also recognize and appreciate the energy and time spent on your part in coordinating field trips. In this guide we have provided information to help make this the best experience possible.

In addition, the Mesa Arts Center has many open and inviting spaces that make good places to hold a brown bag lunch. Prior arrangements for lunch accommodations need to be made by either calling (480) 644-6540 or emailing outreach@mesaartscenter.com.

Please contact our offices should you have any additional questions (contact info on last page).

Enjoy the show!

TEACHER AND CHAPERONE INFORMATION

Chaperones

- Assign each chaperone a designated group of students and provide him/her with a written list of the students in that group.
- Ask chaperones to stay with their assigned group throughout the field trip. Adult chaperones are responsible for the students' conduct and behavior throughout their visit to the Center.
- Please review theater etiquette rules and responsibilities with all chaperones.
- Have the phone numbers of every chaperone in your group to quickly access each other in case of emergency.

Theater Etiquette

- No Food or Drink inside the theatre (besides bottled water).
- Students must be accompanied by chaperones at all times.
- Cameras and recording devices may not be used during the performance.
- Please silence cell phones and resist the urge to text message.
- Listening and following the House Managers and Ushers will help the seating and dismissal process.
- Feel free to laugh, clap and enjoy the show but also to be respectful of those around you.

CURRICULUM CONNECTIONS

National Geographic Live: Bertie Gregory: A Wild Life

Arizona Academic Standards: Discussion Questions

These standards can be achieved by using the discussion questions included in this guide.

Speaking and Listening

Grades 3-8.SL.1 — Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

Grades 3-8.SL.2 — Ask and answer questions about key details in a text read aloud or information presented orally or through other media.

Science

SC04-S2C1-02 — Describe science-related career opportunities.
Grades 7 & 8: SC-S2C1-04 — Evaluate career opportunities related to life and physical sciences.
SC03-S4C3-04 — Describe how plants and animals cause change in their environment.
SC07-S4C3-03 — Analyze the interactions of living organisms with their ecosystems.
SC07-S3C1-01 — Analyze environmental risks caused by human interaction with biological or geological systems.
SC08-S4C4 -01 — Explain how an organism's behavior allows it to survive in an environment.

Arizona Academic Standards: STEAM Lesson

These standards can be achieved by using the STEAM lesson included in this study guide.

Math

5.MD.A.1 — Convert among different-sized standard measurement units within a given measurement system, and use these conversions in solving multi-step, real-world problems.
7.RP.A — Analyze proportional relationships and use them to solve mathematical problems and problems in real-world context.
7.G.A.1 — Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

Mathematical Practice 1 — Make sense of problems and persevere in solving them.
Mathematical Practice 2 — Reason abstractly and quantitatively
Mathematical Practice 6 — Attend to precision.

CURRICULUM CONNECTIONS CONTINUED

National Geographic Live: Bertie Gregory: A Wild Life

Arizona Academic Standards: STEAM Lesson

These standards can be achieved by using the STEAM lesson included in this study guide.

Science

Strand 1 of the Science standards lays out the Inquiry process for students in grades 3-8. Performance objective details vary by grade but the general goals of each Concept are below:

SC-S1C1 — Observe, ask questions, and make predictions.
SC-S1C2 — Participate in planning and conducting investigations, and recording data.
SC-S1C3 — Organize and analyze data; compare to predictions.
SC-S1C4 — Communicate results of investigations.

Additionally these standards support the Engineering Design Process:
Grades 3-5:
SC-S3C2-03 — Design and construct a technological solution to a common problem or need using common materials.
Grade 5:
SC05-S3C1-02 — Propose a solution, resource, or product that addresses a specific human, animal, or habitat need.
SC05-S3C1-03 — Evaluate the possible strengths and weaknesses of a proposed solution to a specific problem relevant to human, animal, or habitat needs.
Grades 6-8:
SC-S3C2-01 — Propose viable methods of responding to an identified need or problem.
SC-S3C2-02 — Compare possible solutions to best address an identified need or problem.
SC-S3C2-03 — Design and construct a solution to an identified need or problem using simple classroom materials.

Speaking and Listening

Grades 3-8.SL.4 — Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

21st Century Learning Skills

By using the STEAM lesson included in this guide, students can become more proficient in the following Competencies:

- **Critical Thinking**
- **Creativity**
- **Communication**
- **Collaboration**

DISCUSSION QUESTIONS

Pre-Performance Discussion Questions

Bertie spends his life exploring wildlife in urban and wild settings. What wildlife do you see where you live? Have you ever had a wildlife encounter?

Bertie Gregory had a fascination with wildlife at a very young age. He studied to be a zoologist but his job as a filmmaker combines his passion for photography and wildlife together. What are you fascinated by? What would your dream job be?

Bertie Gregory has traveled all around the world studying different types of wildlife including leopards, orca, bears, otters, sea lions, coastal wolves, salmon, penguins, jaguars, and bald eagles. What are you hoping to learn more about in Bertie's talk? What wildlife do you find most interesting?

Post Performance Discussion Questions

What was something surprising or interesting you learned from Bertie Gregory's presentation on wildlife?

In what ways did Bertie Gregory demonstrate curiosity, responsibility, empowerment, and persistence in his work? Why do you think these attitudes are important for explorers?

Did Bertie Gregory make any call to action to support his work? Are there any changes we can make in our day to day lives to support the Earth or native wildlife? What can we work on together as a group?

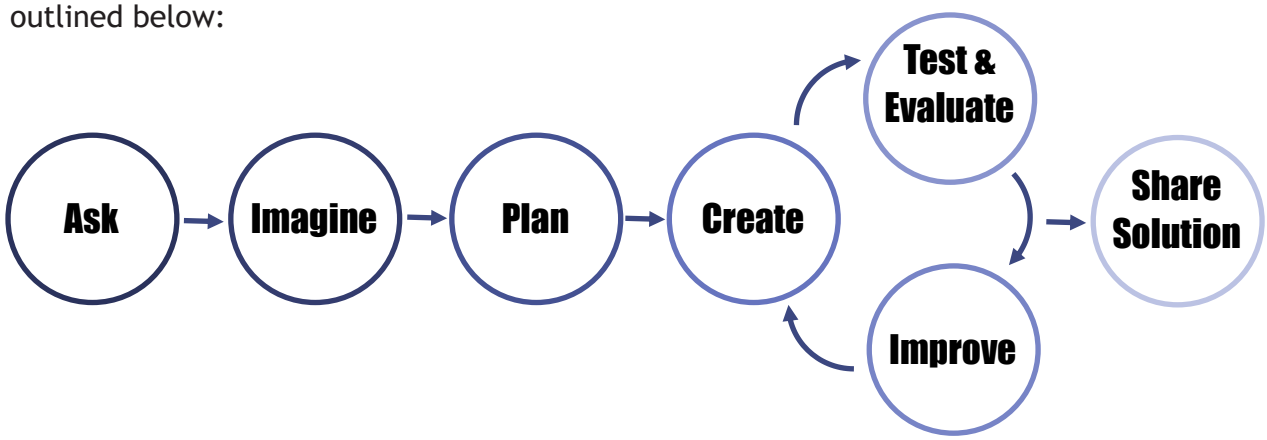
WHAT IS STEM?

STEM is a common buzzword in education these days, so it is important to know what exactly STEM is, and also what it is not. A true STEM lesson not only incorporates different subject areas, but also works to develop students' abilities to think creatively, reason, investigate, and work as a team. Here is a breakdown of what STEM means:

S Science	**T** Technology	**E** Engineering	**M** Math
The study of the natural world.	While traditional digital technology meets this part of STEM, technology is any product made by humans to meet a want or need. Any product created by students to solve a problem can be considered technology.	The design process students use to solve problems.	The study of numbers, equations, functions, and geometric shapes and their relationships.

A science experiment is not necessarily a STEM lesson. The requirements below need to be met as well for a lesson to be STEM based learning:

- The lesson focuses on a real world problem/issue.
- Students are working in productive teams.
- Students are engaging in hands-on inquiry and open-ended exploration. Students should be able to redesign as needed (within time constraints) so there should not be an exact end product/result predetermined by the teacher in mind.
- Students understand that there are multiple right answers to the posed problem and that failure can be used to reevaluate and make changes towards discovering a solution.
- The lesson uses the *engineering design process (EDP)*. EDP is similar to the scientific method and is outlined below:



- Adding any type of art component to the lesson changes STEM to STEAM.

STEAM LESSON: SALMON FRIENDLY DAMS

While on Vancouver Island, Bertie Gregory visited a fish hatchery to learn more about efforts to increase the salmon population in rivers. This is one solution, but does not work everywhere since often times dams pose a large threat to the salmon population. Due to salmons' unusual life cycle and migration for spawning, dams can quickly halt the reproductive cycle for this species. In this lesson, students will work together to create a dam model that allows for salmon migration. The art component is in the sketching portion of the project.

ASK (REAL WORLD PROBLEM)	Dams have many benefits for humans and also change a river habitat to a lake habitat. For some species this is not overly impactful, but for salmon, who split their lifecycle between freshwater and the ocean, dams create a roadblock in their reproductive cycle. If your students need background information on the life cycle of salmon, take a look at page 10 with them. There are a variety of solutions with a range of effectiveness in place at many dams to try to mitigate the damage of dams to the salmon reproductive cycle. Taking these ideas into consideration, as well as thinking of others not yet created, ask students, "Can you create a dam that allows for salmon migration?"
MATERIAL POSSIBILITIES	Students will need a variety of materials to choose from. If you are creating dams to test, students can use popsicle sticks, toothpicks, straws, cardboard, milk cartons, clay, mud, gravel, tape, glue, string, or any other building type of materials that may be available to you. It is easiest for students to build the dams in a small box (shoeboxes work well) so they have side walls to attach their dams to that can represent the banks of the river. Alternatively, this activity can be done using Legos if that is something that is available to students. If you are planning to test out the dams, you will also need a large shallow bin and some water with which to test the dams.
IMAGINE & PLAN	After students have been grouped and presented with the problem, they will need to do a bit of research on current dam practices with relation to salmon. Search terms might include fish ladder, spillway, weir, fish lift, fish lock, and fish passage. Things to consider when creating a dam: How will salmon be able to bypass the dam to get to the ocean? How can you ensure that salmon will not be harmed when getting past the dam? When it is time to spawn, how will salmon swimming up stream reach the other side of the dam? Will your dam require human interaction to be successful or will it work automatically? Students should sketch out their dam design to scale before moving on to the create stage.

Modified from material at: https://www.teachengineering.org/lessons/view/cub_dams_lesson06

STEAM LESSON: SALMON FRIENDLY DAMS

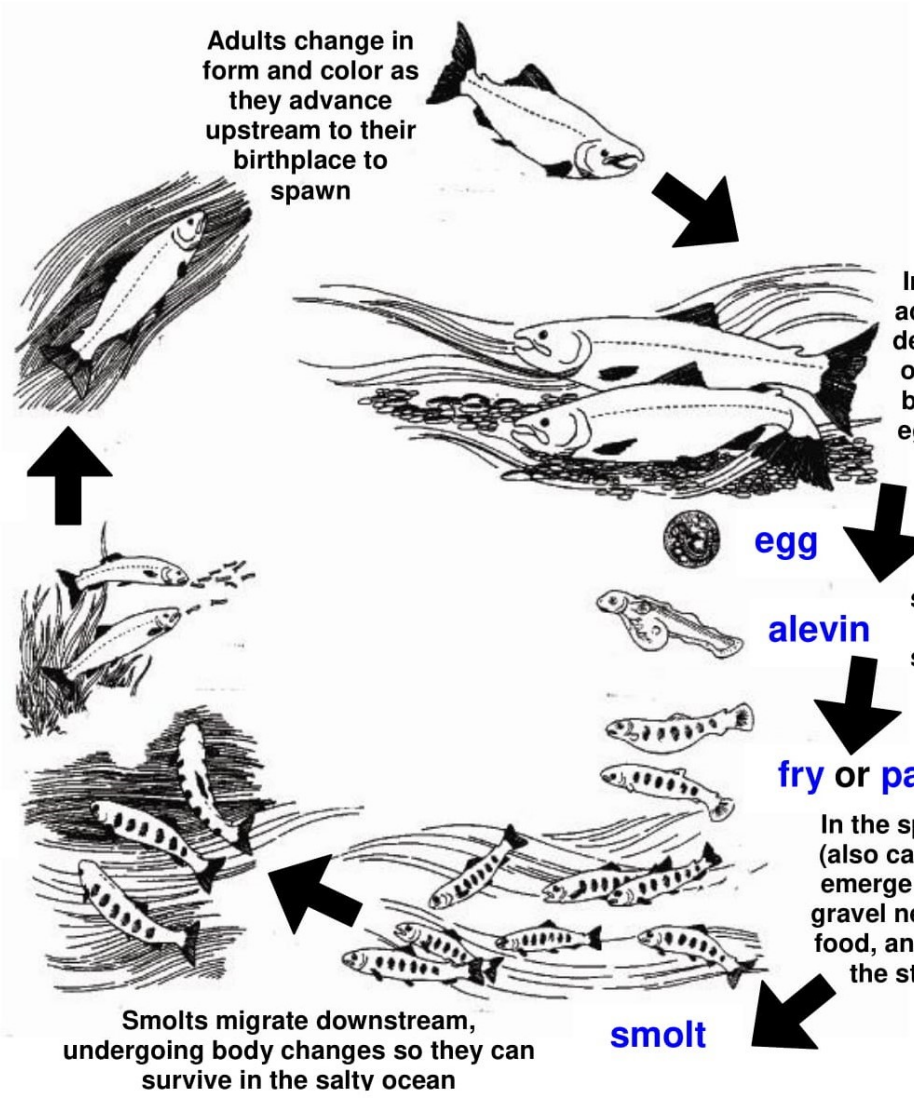
CREATE	After presenting their design sketch and explaining the design choices to their teacher, students can create their dam as long as the materials are available to them. If after presenting the design plan, the students are informed that a material is not available to them they will need to reevaluate their plan and revise it to work with available materials. Remind students that they should be measuring materials to match their design so that they are not using more than necessary or being wasteful with materials. If time allows and you'd like to incorporate more art into this lesson, offer students arts and crafts materials to create a habitat in the box that will house their dam.
TEST, EVALUATE, & IMPROVE	After the dams are created, gather the class to test them. First, the dams will need to be tested to be sure they will do their main job which is to retain water. If the dam holds water, then evaluate the dam to see if the features to allow salmon to migrate are viable. You can use small objects to represent fish or have students manipulate their dam to show what would happen if salmon were migrating. If problems are encountered, give students an opportunity reevaluate their design and improve it if possible. If time allows, try testing the improved dam again.
SHARE SOLUTIONS	Once the dams have been tested, evaluated, and improved if needed, students can present their findings to the class. The class can discuss any factors that may have contributed to the success or failure of each dam. If you live in an area where salmon migrate, check into the structure of dams in the area to see if they allow for salmon migration and compare the design to those made by the students.

LITERACY CONNECTIONS

- *Students can create a comic strip showing the life cycle of a salmon utilizing their dam design to successfully complete its life cycle.*
- *Students could also write a persuasive paragraph or paper on the importance of maintaining salmon populations through the use of salmon friendly dams. Students can include what they consider the most successful practices when designing dams that allow for salmon migration.*

Modified from material at: https://www.teachengineering.org/lessons/view/cub_dams_lesson06

Salmon Life Cycle

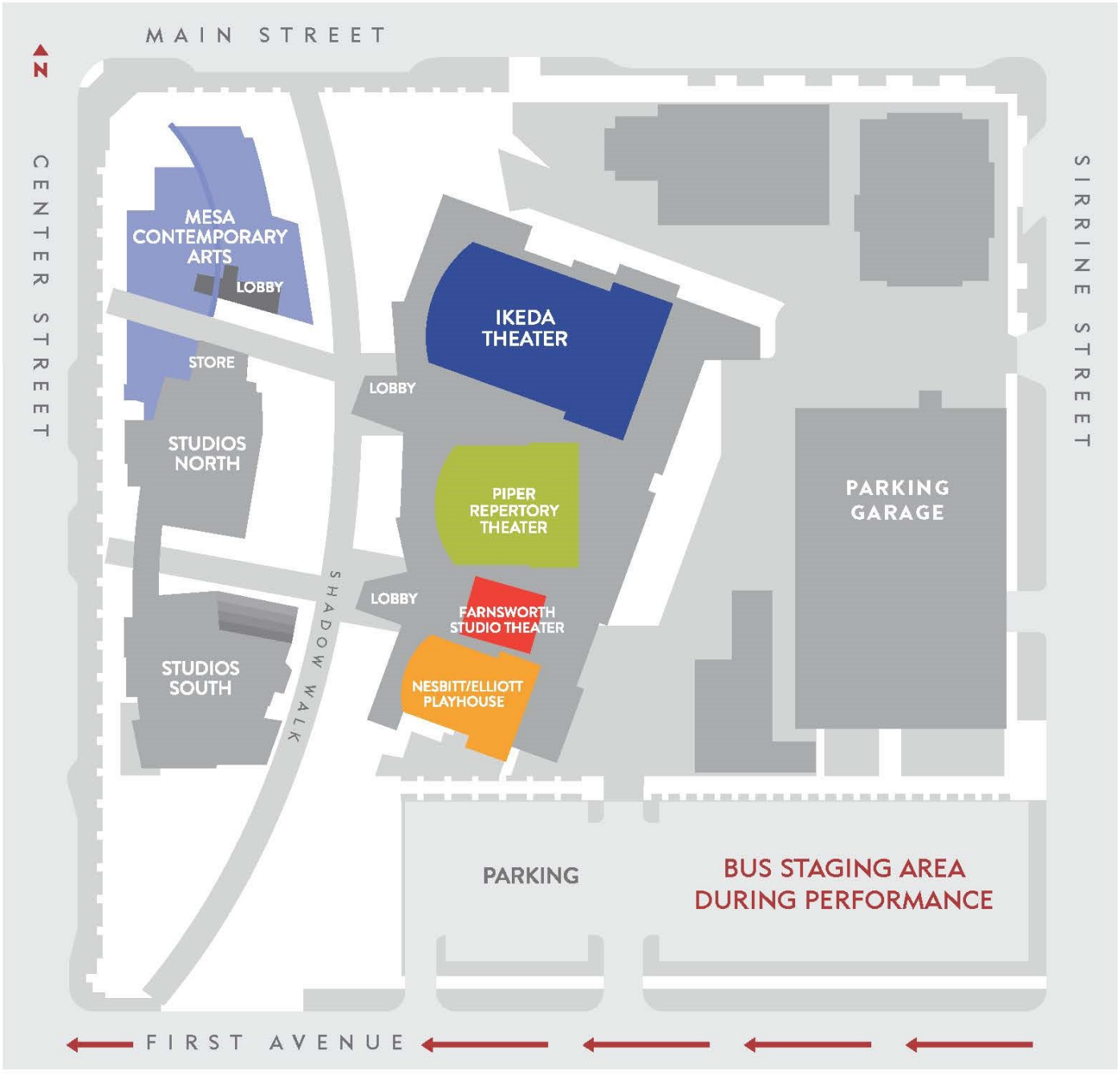


Question: A dam would most likely affect mature adult salmon when they are swimming upstream to their birthplace to spawn (reproduce). If a dam prevents them from reaching the area where they spawn, what happens to the salmon population? Will it increase, decrease or stay the same?

Source of graphic: Life cycle of the Pacific salmon, 2-7 years, Alaska Department of Fish and Wildlife, http://www.sf.adfg.state.ak.us/region2/ie/sicc/salmon_p.cfm and Oregon Department of Fish and Wildlife "Stream Scene," http://www.oregon.gov/OPSW/archives/streamscene/streamscene.shtml

BUS PARKING MAP

MESA ARTS CENTER



STEPS TO UNLOAD

1. Enter the drop off area by coming in westbound on 1st Avenue.
2. Pull up to the curb marked with cones and wait until notified to unload passengers.
3. Await parking direction from MAC security

STEPS TO PICK UP

1. Passengers will exit the theater and meet buses in the bus parking lot area.
2. Wait for clearance to depart.

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THANK YOU!

Questions? Please contact Engagement at:

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