



EDUCATION @ MESA ARTS CENTER



**MESA ARTS CENTER PRESENTS
NATIONAL GEOGRAPHIC LIVE!
HILAREE O'NEILL: POINT OF NO RETURN**

Ikeda Theater | March 29 | 10:15 AM | Grades: 5 - 8

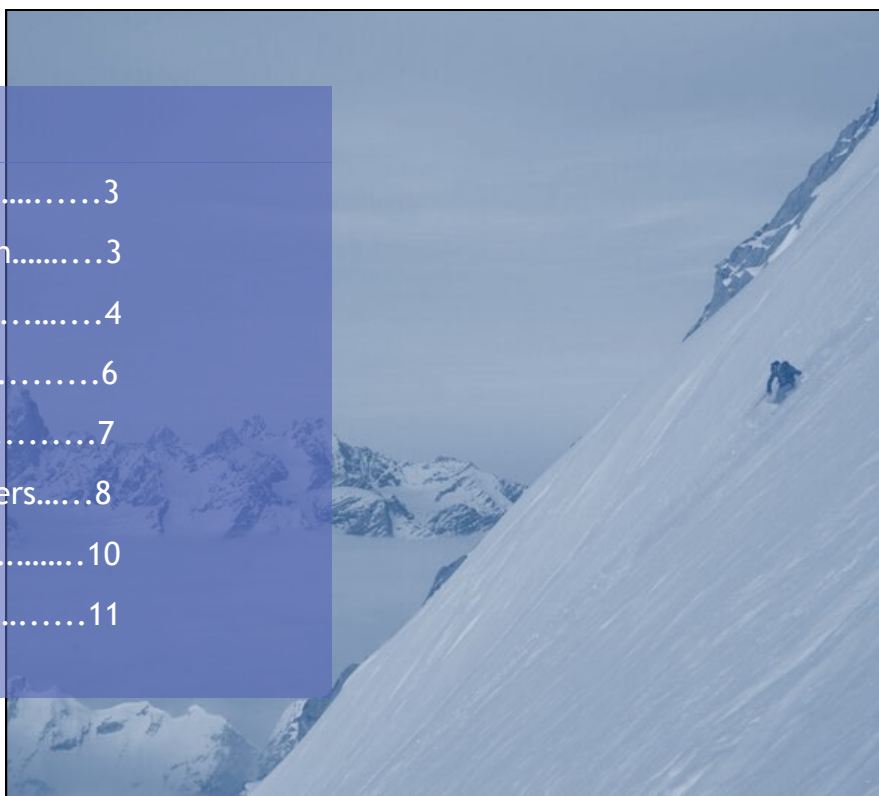
2017/2018 EDUCATOR RESOURCE GUIDE



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ABOUT HILAREE O'NEILL, MOUNTAINEER...

National Geographic Live! brings you Hilaree O'Neill, a renowned mountaineer known for being the first woman to summit Everest as well as neighboring Lhotse in a 24 hour period. Hilaree O'Neill is known for being extremely adventurous so it was not a surprise that she was willing to lead a team of explorers to reach the summit of Burma's Hkakabo Razi to see if it is Southeast Asia's highest point. This journey proved to be more than the team bargained for as they suffered numerous setbacks and other obstacles such as dwindling rations, exhausting jungle hikes, team personality conflicts, and hypothermia once they neared the summit.

In this presentation, Hilaree O'Neill talks about this harrowing experiences as well as the tough decisions she had to make as team leader to bring everyone down from the mountain in one piece. Her experience of 35 expeditions over the past 15 years no doubt helped her and her team survive this dangerous expedition. Although the team was not ultimately able to reach the summit of Hkakabo Razi, Hilaree O'Neill views the experience as an opportunity to analyze what factors led to their failure so that future expeditions can be more successful. This persevering attitude in the face of failure is no doubt one of the reasons why *Outside* magazine named her "One of the Most Adventurous Women in the World of Sports."



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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 pg.).

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.



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CURRICULUM CONNECTIONS

National Geographic Live: Hilaree O'Neill: Point of No Return

Arizona's College and Career Ready Standards

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

Speaking and Listening

Grades 5-8.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 5-8.SL.2 — Ask and answer questions about key details in a text read aloud or information presented orally or through other media.

Social Studies

Grades 5-8: SS-S4C1-03 — Identify or interpret maps, charts, and geographic databases using geographic information.

Science

SC05-S4C1-03 — Identify the functions and parts of the nervous system: brain, spinal cord, and nerves.

Arizona's College and Career Ready Standards

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.

6.RP.A.3 — Use ratio and rate reasoning to solve mathematical problems and problems in real-world context.

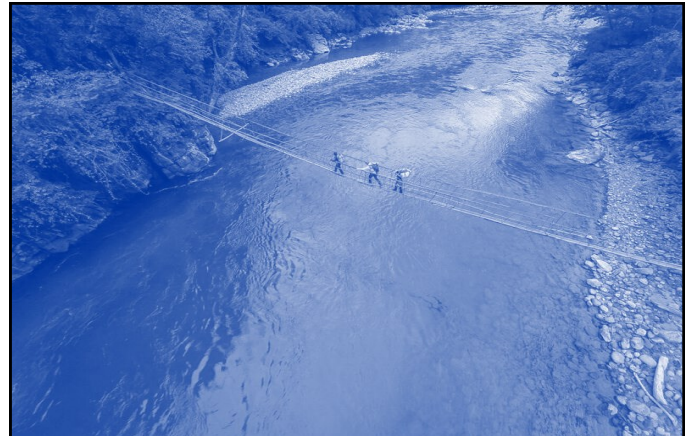
7.RP.A — Analyze proportional relationships and use them to solve mathematical problems and problems in real-world context.

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.





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CURRICULUM CONNECTIONS CONTINUED

National Geographic Live: Hilaree O'Neill: Point of No Return

Arizona's College and Career Ready Standards

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Science

Strand 1 of the Science standards lays out the Inquiry process for students in grades 5-8. 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:

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.

SC05-S3C2-03 – Design and construct a technological solution to a common problem or need using common materials.

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 5-8.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





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DISCUSSION QUESTIONS

Pre-Performance Discussion Questions

Students may be unfamiliar with Myanmar (also known as Burma). You can go to mapmaker.nationalgeographic.org and look up in the highest tip of Myanmar in Asia to find Hkakabo Razi. There's many layers or views possible on this website to investigate the area. You can also search for Hkakabo Razi on Google maps and look at satellite images.

Hilaree O'Neill's expedition in Myanmar did not go quite as planned. The team suffered many setbacks and challenges. Why is failure important? What can we learn from not succeeding?

Hilaree O'Neill has written several blog entries about her Myanmar expedition. Read aloud or have students read this reflective blog and then ask what made Hkakabo Razi the "Anti-Everest"? Find the blog here: <http://adventureblog.nationalgeographic.com/2014/12/16/myanmar-climb-reflections-on-surviving-the-anti-everest/>

Post Performance Discussion Questions

What was something surprising or interesting you learned from Hilaree O'Neill's presentation on mountaineering?

In what ways did Hilaree O'Neill demonstrate curiosity, responsibility, empowerment, and persistence in her work? Why do you think these attitudes are important for explorers?

Did Hilaree O'Neill make any call to action to support her work? Are there any changes we can make in our day to day lives to support the Earth or exploration? What can we work on together as a group?



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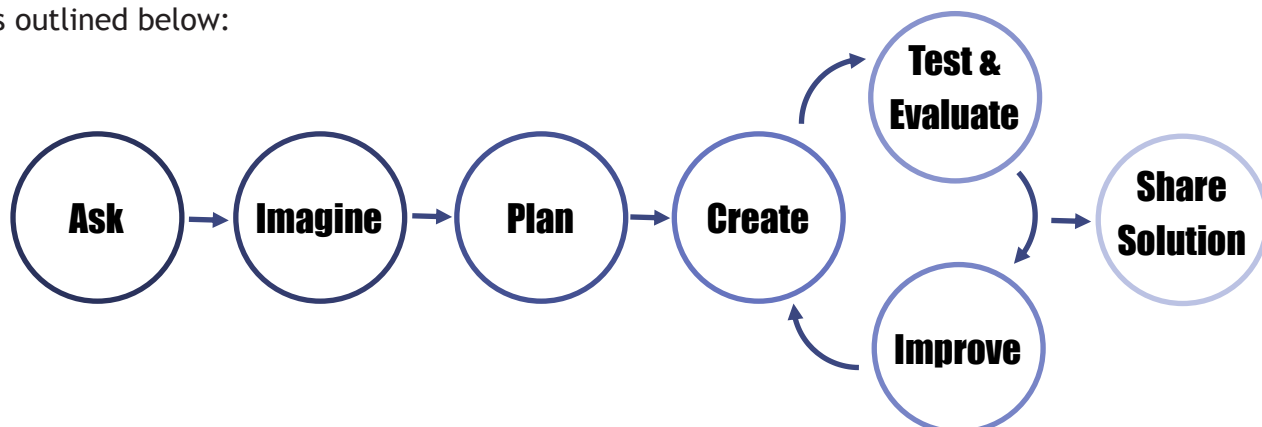
WHAT IS STEM?

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.



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STEM LESSON: ENGINEERING A MOUNTAIN RESCUE LITTER

Hilaree O'Neill has traveled in uncharted wilderness and climbed dangerous mountains. With extreme conditions like this, it is possible that a climber could be injured and need to be transported back to receive medical care. In this STEM lesson, students will work together to design and assemble a model of a mountain rescue litter that might be used in a situation like this.



ASK (REAL WORLD PROBLEM)	We may not all be mountain climbers like Hilaree O'Neill, but it is likely that you might go on a hike with friends or family. What if someone was injured on a hike and needed medical attention? Often when hiking the area is not suitable for an ambulance to drive on and the injured person would need to be carried to a road. It is crucial that while being carried the victim remain as stable as possible to avoid spinal injury which can lead to paralysis. Utilizing a rescue litter can help stabilize the victim to avoid further injuries. Ask students, "Can you design and assemble a mountain rescue litter that is stable, portable, lightweight, and easy to assemble?"
MATERIAL POSSIBILITIES	Students will need a variety of materials to choose from to create their rescue litter. For safety purposes, this will be a model of a rescue litter with a potato serving as the victim. Their rescue litter should fit (disassembled) into each group's rescue backpack (a Ziploc sandwich bag). To create their rescue litter students would likely use materials such as toothpicks, popsicle sticks, straws, paper towels, paper, aluminum foil, or sponges cut lengthwise into thin pieces. Each group should receive a similar sized potato and also have a separate potato for the final test that was not used by any of the groups in the design process. If you are using weight as a constraint you will also need a scale to weigh the litters.
IMAGINE & PLAN	After students have been grouped and presented with the problem, they may need some background on rescue litters and spinal injuries to help with designing. This is a lesson summary of a much more detailed lesson you can find at: https://www.teachengineering.org/activities/view/cub_human_lesson06_activity3. There is a lot of detailed information at the beginning of the lesson that may help your students with the purpose and design of rescue litters. <u><i>Before designing also make sure your students understand how the test will work (see the test section on the next page).</i></u> The following constraints can be included as you deem appropriate for your students' age and skill level: timed test, disassembled litter must fit in rescue backpack, weight limit of litter, or give students a budget for the supplies they "purchase" from you. Students should sketch out their rescue litter design before moving on to the create stage.



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STEM LESSON: ENGINEERING A MOUNTAIN RESCUE LITTER

CREATE	After presenting their design sketch and explaining the design choices to their teacher, students can create their rescue litter. Students should practice assembling and disassembling their rescue litters. If you are using the rescue backpack constraint they can make sure the litter pieces fit in the bag. You can add an additional constraint of telling students you will select a random team member to assemble the litter during the test. This will ensure that all team members are familiar with the design and assembly. Students can use their group's potato to practice the test. Be sure to remind students that they can only carry the litter from the edges or corners and not by holding underneath.
TEST, EVALUATE, & IMPROVE	Be sure to familiarize students with the test expectations including all constraints <i>before</i> they begin the design process to increase the likelihood of success. For the test: Set up two locations in the room. The first is the ambulance location where the group members start with their disassembled litter in their rescue backpack. Students should carry the rescue backpack to where the victim (potato) is at the second location. Then a group member should assemble the litter and at least two group members should carry the litter with the potato by holding only corners or edges back to the first location without the potato falling off. Additional data such as timing the test, weighing the litter/rescue backpack, and calculating the cost of the litter can also be determined at this point if those constraints are being used.
SHARE SOLUTIONS	Once the rescue litters have been tested and evaluated, the class can discuss the results. Which litters best met all the constraints? What could be changed about a litter or design to help it better fit the constraints? Which specification is most important to the litter out of the following: stable, portable, lightweight, and easy to assemble? The class can also discuss any factors that may contribute to the success or failure of each rescue litter.



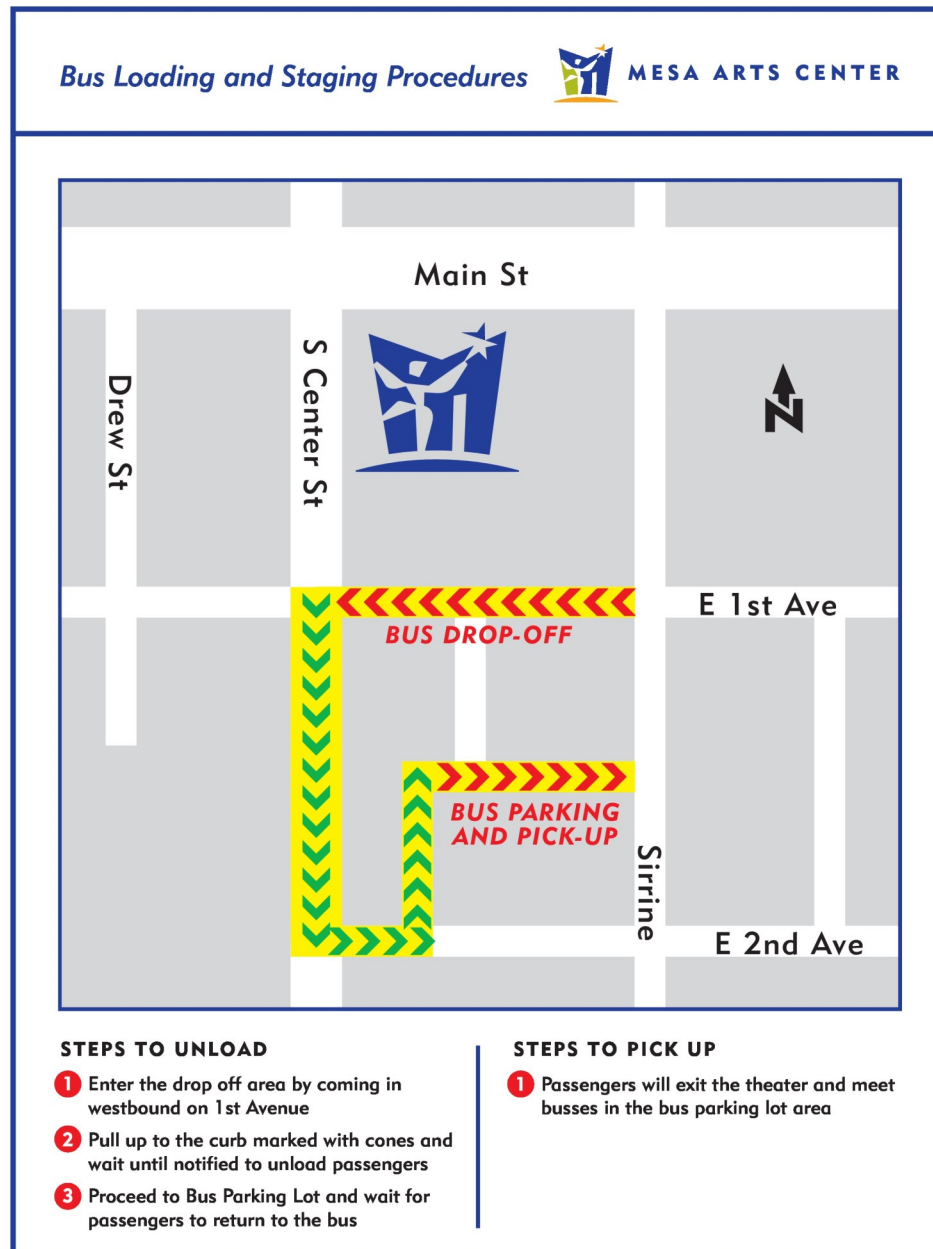
LITERACY CONNECTIONS

- *Students can create an advertisement for their rescue litter. The advertisement should include a scaled diagram and explanation of important features.*
- *Students could also write a research paragraph or paper on a climbing expedition. Students should include information about the mountain climbed, resources needed, and the mountaineers included in the team.*



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MESA ARTS CENTER MAP



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PLEASE NOTE - We ask that buses arrive approximately 30 minutes before the performance begins to allow ample time to unload and seat students.



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SHARE YOUR EXPERIENCE!

We'd love to hear your students' response to our shows.
We especially appreciate pictures and letters!

THANK YOU!

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