



EDUCATION @ MESA ARTS CENTER



MESA ARTS CENTER PRESENTS
NATIONAL GEOGRAPHIC LIVE!
ANDY MANN: FROM SUMMIT TO SEA

Ikeda Theater | March 19 | 10:15 AM | Grades: 5 - 8

2019/2020 EDUCATOR RESOURCE GUIDE



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ABOUT ANDY MANN, PHOTOGRAPHER & FILMMAKER...

Award-winning filmmaker and photographer Andy Mann combines his passions with purpose as a voice for the world's oceans, following scientists to some of the most extreme locations on the planet in the hope of inspiring change.

Andy's journey from rock climber to ocean storyteller involves some remarkable detours and misadventures that prove that field science can be every bit as thrilling as the climbing adventures of his past. He has dived alongside crocodiles, sperm whales, and sharks and survived near misses with icebergs, all in pursuit of his ultimate goal: to shed light on Earth's incredible ocean environments and advocate for their protection.

Andy is the co-founder and director at 3 Strings Productions, the commercial and documentary film studio in Boulder, CO and works with clients such as Red Bull, Toyota, The North Face, National Geographic and more. He also a founding member of the Sea Legacy Collective with Paul Nicklen and Cristina Mittermeier.

He now spends over 100 days a year at sea, documenting cutting-edge marine science and telling the story of our rapidly changing planet—covering all seven continents for National Geographic.



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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. No prior arrangements need to be made.

Please contact our offices at engagement@mesaartscenter.com or 480-644-6564 should you have any additional questions.

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: Andy Mann: From Summit to Sea

Arizona Academic Standards: Discussion Questions

These standards can be achieved by using the discussion questions 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

Science

SC05-S3C-03 — Evaluate the possible strengths and weaknesses of a proposed solution to a specific problem relevant to human, animal, or habitat needs.

SC06-S4C3-02 — Describe how the environmental conditions such as water quality, climate, population density, and smog affect the quality of life.

SC07-S3C1-01 — Analyze environmental risks caused by human interaction with biological or geological systems.

SC08-S3C1-01 — Analyze the risk factors associated with natural, human induced, and/or biological hazards.

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.



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CURRICULUM CONNECTIONS CONTINUED

National Geographic Live: Andy Mann: From Summit to Sea

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 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:

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

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 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

Andy Mann is passionate about ocean conservation. Protecting the environment has become a commonly discussed topic in recent years. What do you already know about protecting the environment? What can we do to help protect our oceans?

Andy Mann is not only a photographer and filmmaker, but also a rock climber and an adventurer. Do you see yourself as an adventurer? What part of the earth would you like to adventure to? Are you more intrigued by the sea or summits of mountains?

Watch this Earth Day spot where Andy Mann was the underwater director to see an example of his inspiring underwater filmography: <http://www.andymann.com/conservation#/apple-earth-day-spot-uw-director/>. One of goals of conservationist filmmakers and photographers is to inspire you to take action by seeing what is at stake in our environment. Which images inspired you the most in this video?

Post Performance Discussion Questions

What was something surprising or interesting you learned from Andy Mann's presentation on ocean conservation?

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

Did Andy Mann make any call to action to support his work? Are there any changes we can make in our day to day lives to support people or animals in crisis? What can we work on together as a group?



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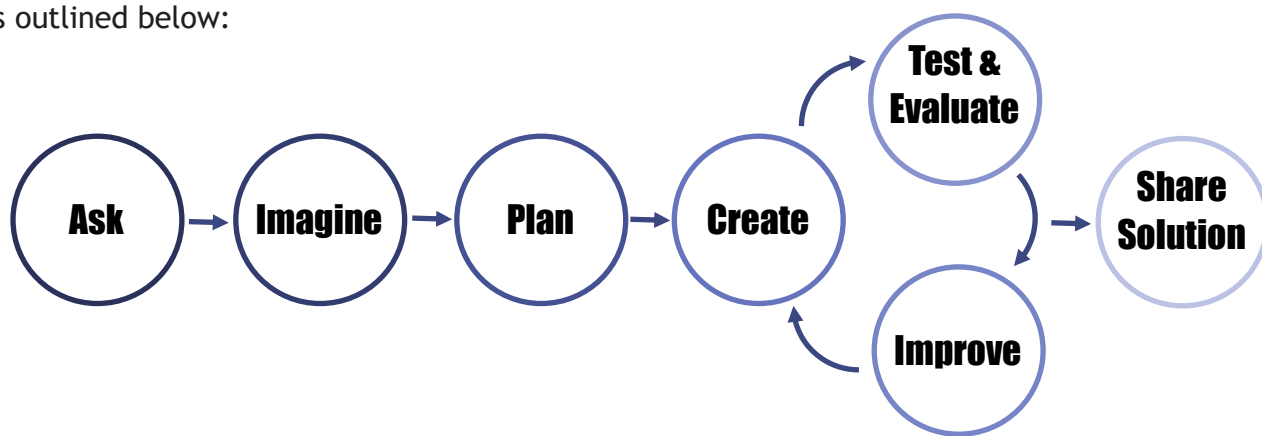
WHAT IS STEM?

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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STEAM LESSON: BUILDING WITHIN BIOMES

Andy Mann has been involved with conservation efforts where government policy leads to protected environment areas. Although this is ideal, it is not always possible. Sometimes conservation may mean creating spaces where humans and native species can coexist. It can be hard to balance human and wild animal needs in a biome, which can lead to species endangerment or even extinction. Communities that use green neighborhood design take into consideration the species that live in a natural habitat and work to coexist with them as much as possible. In this lesson, students will design a new neighborhood development that reduces as much as possible its impact on a native species to the area.



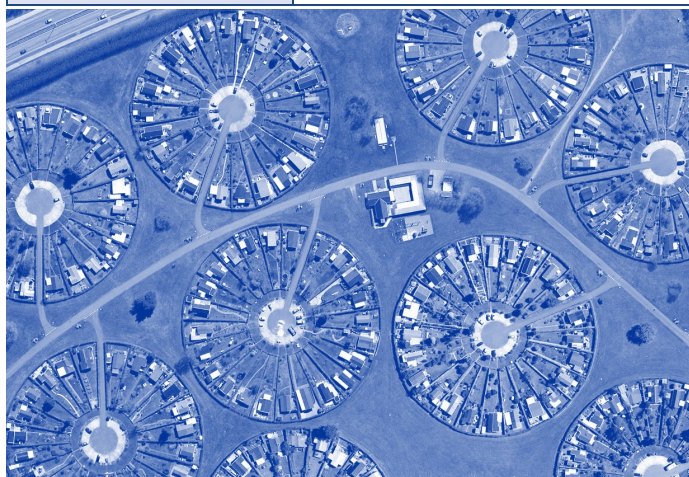
ASK (REAL WORLD PROBLEM)	When a new housing community is built, the habitat that was once in its place is impacted. This impact can be great such as pollution contaminating food and water sources, and sometimes unintended with noise pollution disrupting a nesting ground. As the consequences to native animals has become clear over the years, developments have started using green neighborhood design in an effort to minimize this impact. Imagine you are in a particular biome, such as the desert, grassland, or deciduous forest and a new housing development is about to be built, but a conservation group is insisting a native animal be considered. Ask students, “Can you design a housing community that has as little impact as possible on a native animal species?”
MATERIAL POSSIBILITIES	There are three parts to this lesson: a pamphlet, a map, and a presentation. Depending on the age and ability of your class this can look quite different. Pamphlets are generally a trifold brochure style using paper or construction paper. They could also be created in a computer program like Word or Publisher. The map should be on large construction paper, poster board, or butcher paper so that students can draw details clearly. The presentation can use visuals in addition to the pamphlet and map. Students can also create a PowerPoint or Google Slides presentation about their neighborhood development. A variety of art materials such as crayons, markers, scissors, glue, etc. should be available to students for all three parts.
IMAGINE & PLAN	After students have been grouped and presented with the problem, assign each group a biome and a native animal to protect. They will need to do a bit of research on both the biome and the native animal so students should partner up within their group to research. Things to consider when designing a housing community: What component of the biome is most important to the survival of the animal? What is special about your layout or housing that encourages this species to remain? What makes this housing community desirable to home buyers? What other “green design” features can you add to your community to make it more sustainable? Students should sketch out their housing plan to scale before moving on to the create stage.



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STEAM LESSON: BUILDING WITHIN BIOMES

CREATE	After presenting their design sketch and explaining the design choices to their teacher, students will need to decide on jobs and task allocation for the three project components. These can be assigned by the teacher if needed, but ideally students should work together to decide who is responsible for what. Alternatively, they can also work on all the project components and switch off after a set time period. Students will need to create a trifold pamphlet detailing the housing community amenities, conservation efforts with regards to the native species, and biome information. Students will also create a large map that shows the housing layout, nearby amenities, and the conservation strategies. Finally, students will be responsible for a presentation to “sell” their housing community to potential buyers (their classmates).
TEST, EVALUATE, & IMPROVE	Once all groups have completed their pamphlet, map, and presentation, groups will take turns presenting to the class, their potential buyers. The buyers can evaluate each community on their creativity, practicality, and overall success of conserving the habitat for the native species. After all the groups have presented, the class can vote on which housing community they felt best balanced the needs of humans and animals. Discuss what features made that housing community most desirable in this situation.
SHARE SOLUTIONS	After all the presentations have been completed, have students get back together with their group and see if they can think of at least two improvements they could add to or change about their housing development after seeing all of the presentations. Have each group share out their new ideas to finish off the lesson.



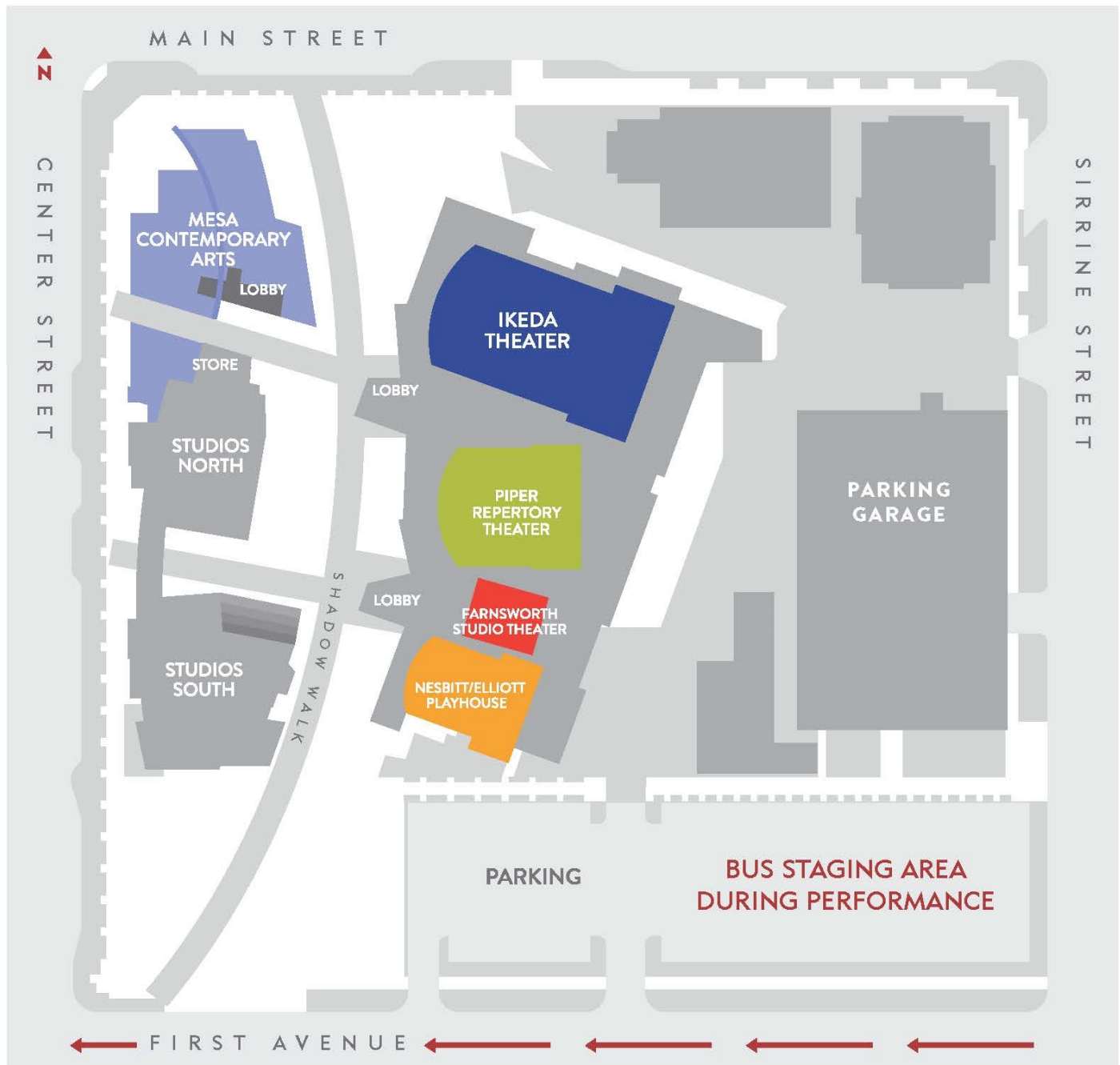
LESSON RESOURCES

- *Biomes and animals list:*
https://www.teachengineering.org/content/uoh/activities/uoh_working/uoh_working_activity1_list.pdf
- *Rubric example:*
https://www.teachengineering.org/content/uoh/activities/uoh_working/uoh_working_activity1_rubric.pdf

BUS PARKING MAP



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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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SHARE YOUR EXPERIENCE!

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

THANK YOU!

Questions? Please contact Engagement at:

P 480-644-6540 | F 480-644-6503

engagement@mesaartscenter.com