



EXPEDITION
DAYS



MCDOWELL
SONORAN
CONSERVANCY

Expedition Days Online

4th GRADE HANDBOOK



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Welcome to Expedition Days Online!

This unit is designed to broaden your students' knowledge of the diverse Sonoran Desert environment and deepen their understanding of how they, too, are a part of this complex ecosystem.

Expedition Days Online (EDO) integrates inquiry and exploration into student learning, fits both in-person and virtual teaching formats, and is customizable to the needs of your classroom. The unit is aligned with multiple 4rd grade math, language arts, social studies, and science standards to create a holistic STEAM curriculum.

To help you integrate EDO into your teaching, in this packet you will find:

- A “how-to” overview for using the EDO curriculum.
- A comprehensive list of standards for each module.
- Concept maps for each of the modules.
- Activity list for each module with time estimates.

We have designed this unit to be both accessible and meaningful for you and your class. To continue improving Expedition Days Online and future programs, **if you participate, we ask that you:**

1. Have students complete the pre-assessment **before** using the materials: <https://www.surveymonkey.com/r/ZQJX8Z2>
2. Have students complete the post-assessment **after** using the materials: <https://www.surveymonkey.com/r/ZQ899SV>
3. Complete a teacher feedback survey when you are finished using the materials: <https://www.surveymonkey.com/r/FCF5K3L>

How to use Expedition Days Online

Expedition Days Online is designed to fit your unique classroom and we encourage you to customize the material to suit the needs of your students.

Here are some general suggestions for using the curriculum:

1. Use the module overviews and concept progressions to get a sense of what the module will entail and what your students will learn about.
2. **The resources page can be accessed here:**
<https://www.mcdowellsonoran.org/expo-modules> the **login code is: EDO**
3. On the resources page there are Study Guides with activities for each module. Students or teachers can download and print these from the student resources page.
4. On the student resources page, each module is an embedded presentation. These presentations include all necessary videos, links, concept information, and activity directions.
5. Please adapt this material for your particular instructional format and students.
6. If you have trouble accessing any of the materials please email expeditiondays@mcdowellsonoran.org.

4th GRADE STANDARDS

		Watersheds	Documenting Wildlife	Secrets of the Desert	Tipping the Scales
Science Standards					
U2:	The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.		✓		
U3:	Applications of science often have both positive and negative ethical, social, economic, and/or political implications.		✓		
4.E1U1.6:	Plan and carry out an investigation to explore and explain the interactions between Earth's major systems and the impact of Earth's surface materials and processes.	✓			✓
4.E1U1.7:	Develop and/or revise a model using rock types, fossil locations, and landforms to show evidence that Earth's surface has changed over time.	✓		✓	
4.E1U3.9:	Construct and support an evidence-based argument about the availability of water and its impact on life.	✓	✓	✓	
4.E1U2.10	Define problem(s) and design solution(s) to minimize the effects of natural hazards.	✓		✓	✓
4.L4U1.11	Analyze and interpret environmental data to demonstrate that species either adapt and survive or go extinct over time.		✓	✓	✓
Math Standards					
4.OA.C:	Generate and analyze patterns.	✓	✓	✓	✓
4.MD.B:	Represent and interpret data.	✓	✓	✓	✓
Standards for Mathematical Practice:					
SMP 1:	Make sense of problems and persevere in solving them.			✓	✓
SMP 2:	Reason abstractly and quantitatively.		✓	✓	✓
SMP 4:	Model with mathematics.		✓	✓	✓
SMP 5:	Use Appropriate tools strategically.		✓	✓	✓
SMP 7:	Look for and make use of structure.		✓	✓	✓
History and Social Science Standards					
4.SP1.1:	Create and use a chronological sequence of related events to compare developments that happened at the same time.			✓	✓
4.SP1.2:	Compare life in specific historical time periods to life today.			✓	✓
4.SP2.2:	Explain connections among historical contexts and people's perspectives at the time.			✓	✓
4.SP4.1:	Explain probable causes and effects of events and developments.	✓	✓	✓	✓

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4.SP3.6:	Present summaries of arguments and explanations using print, oral, and digital technologies.	✓		✓	✓
4.G2.1:	Compare the diverse ways people or groups of people have impacted, modified, or adapted to the environment of the Americas.	✓		✓	✓
4.G3.1:	Explain how the locations and use of resources affect human settlement and movement.	✓			✓
Inquiry Elements					
Element 3:	Gathering and Evaluating Sources	✓	✓	✓	✓
Element 4:	Developing Claims	✓	✓	✓	✓
Element 5:	Communicating Conclusions	✓	✓	✓	✓
Element 6:	Taking Informed Action	✓	✓	✓	✓
English Language Arts Standards					
4.RI.1:	Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.	✓	✓	✓	✓
4.RI.3:	Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.	✓		✓	✓
4.RI.7:	Interpret information presented visually, orally, or quantitatively (charts, graphs) and explain how the information contributes to an understanding of the text in which it appears.	✓	✓	✓	✓
4.W.1:	Write opinion pieces on topics or texts, using reasons to support one's point of view.	✓	✓	✓	✓
4.W.2:	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	✓	✓	✓	✓
4.SL.3:	Identify the reasons and evidence a speaker provides to support particular points.	✓	✓	✓	✓
4.SL.5:	Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.	✓	✓		
Visual Arts					
VA.CR.1.4a	Independently brainstorm multiple approaches to solve a creative art or design problem.		✓	✓	
VA.CR.1.4 b	Collaboratively set goals and create artwork that is meaningful and has purpose to the makers (such as individual works with a similar purpose or group work with shared goals).		✓	✓	

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Tech					
3-5.2.c.	Students, in collaboration with an educator, examine, use, and demonstrate respect for intellectual property including copyright, permission and fair use, with both print and digital media when using and sharing the work of others.		✓	✓	
3-5.3.a.	Students, in collaboration with an educator, employ appropriate research techniques to locate digital resources that will help them in their learning process.		✓	✓	
3-5.3.d.	Students, in collaboration with an educator, explore real world problems and issues and collaborate with others to find answers or solutions.		✓		
3-5.6.c	Students, in collaboration with an educator, create digital artifacts using multimedia tools to communicate ideas visually, graphically, auditorily.		✓		

MODULE OVERVIEWS

Watersheds Overview

Student Time:

- 15-30 min. online presentation
- 90-120 min. completing activities
- 20-30 min. completing mini project

Aims

To learn how humans depend on the quality and quantity of water in our watershed and how this affects the health of our ecosystem

Objectives

- To understand that water moves down because of gravity
- To understand that a watershed is a land area that drains to the low points
- To learn that there are events that affect the quality and quantity of water in a watershed (such as drought, floods, erosion, etc.)
- To learn that we all live in a watershed and affect the health of the watershed
- To learn that humans manage the land (neighborhoods, farms, forests, etc.) for the water quality and health of the people and ecosystem

Documenting Wildlife Overview

Student Time:

- 45-60 min. online presentation
- 45-60 min. completing activities
- 20-30 min. completing poster project

Aims

To understand that we share our environment with many species that have adapted to their environment

Objectives

- Understand the science behind camera trapping project
- Understand about the ethics of camera trap projects
- Be able to become citizen scientists and evaluate the data and art collected

Secrets of the Desert Overview

Student Time:

- 180-240 Digital Escape Room Activities and mini projects

Aims

To learn secrets of the Sonoran Desert while solving puzzles in a digital Escape Room

Objectives

- To understand how animals have adapted to the Sonoran Desert
- To understand how the Sonoran Desert has changed over time
- To learn how to help protect the Sonoran Desert
- To learn how to stay safe in the Sonoran Desert
- Be able to share their findings about the Sonoran Desert

Tipping the Scales (supplemental) Overview

Student Time:

- 45-60 min. online presentation
- 30-60 min. completing activities
- 20-30 min. completing mini project

Major Theme

There are multiple ways an ecosystem can become unbalanced, many of which are human caused. To ensure the health and longevity of the Sonoran Desert ecosystem, we must find ways to bring it back into balance

Big Ideas

- Invasive species may cause an unbalanced ecosystem if they outcompete native species for resources and the native species disappear
- The loss of keystone species, either through human or natural causes, can unbalance an ecosystem
- Climate change stresses the environment and leads to unbalanced ecosystems

ACTIVITY LIST

Module	Activity	Page Number	Student Goals	Est. time (minutes)
Watersheds	Exploring Water Movement	1	Investigate how water moves on different surfaces and record what you observe.	30-40
Watersheds	Water Movement in Nature	4	Investigate how water moves on different surfaces in the natural world and record what you observe.	30-40
Watersheds	Urban Surfaces	6	Come up with different permeable and/or impermeable human-made surfaces you see around your home and city.	10-20
Watersheds	Where is There Water?	8	Write down places around your home and in nature where you see water. Determine whether these locations are naturally created or human-made.	10
Watersheds	Do You Live in a Watershed?	9	Use the map to determine if you live in a watershed.	20
Watersheds	What Affects a Watershed	10	Use the map to investigate different events that can affect the quality and quantity of water in the watershed.	30
Watersheds	How Do We Use Water	11	List different ways people and businesses use water every day.	10-15
Watersheds	Making a Watershed	12	Make a watershed model and identify the features of the watershed.	30-45
Watersheds	Caring for the Watershed	14	Design ways to protect the quality and quantity of water in a watershed.	30
Documenting Wildlife	What Plants and Animals Have You Seen?	1	List or draw plants and animals that you have seen.	10
Documenting Wildlife	Wildlife Encounters Survey	2	Record data on what wildlife friends and family have seen, then make a graphical depiction of this data.	20-30
Documenting Wildlife	Wildlife Encounters Graph	3	Create a chart of the data collected in the survey and analysis of the results.	10
Documenting Wildlife	Wildlife Encounters Story	4	Write a story about wildlife encounters using the writing prompts.	20
Documenting Wildlife	Zooniverse Activity	5	Explore Zooniverse and retake the survey https://www.zooniverse.org/projects/mcdowellsonoranconservancy/expedition-days-online .	30
Documenting Wildlife	Zooniverse Reflection	6	Reflect on Zooniverse.	10
Documenting Wildlife	About Trail Cameras	7	Decide where to place a camera in the schoolyard.	5
Documenting Wildlife	Using Trail Cameras	8	Draw a map of where to place a trail camera in the schoolyard.	10

Documenting Wildlife	Corridor Viability Project	9	Look at how wildlife could move in the Preserve.	5
Documenting Wildlife	Zooniverse Top Tips	10	Top tips for using Zooniverse.	10
Documenting Wildlife	Sharing Data	11, 14-18	Create one or all of the following campaigns; Citizen Scientist, Public Awareness, Art & Photography.	30
Documenting Wildlife	Using Canva	12	Extension: Create projects on Canva.com.	20
Documenting Wildlife	Applying for a Camera	19	Apply for a trail camera. https://forms.gle/tfd4Dyy6PQmwQQwRA	10
Secrets of the Desert	Home	1	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/home Set the scene.	1
Secrets of the Desert	Location Puzzle	2-3	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/location?authuser=0 Use observational skills to decode a GPS coordinate.	5
Secrets of the Desert	Geological Timeline	4	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/run/what-year-is-this Use images to create a Geological Timeline.	10
Secrets of the Desert	Ice Age	5	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/it-is-cold/ice-age Learn about Woolly Mammoths and the Ice Age.	10
Secrets of the Desert	Snow in the Desert	6-7	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/it-is-cold/snow-in-the-desert learn that not all deserts are hot. Learn about climate change and Emperor penguins by looking at graphs.	10
Secrets of the Desert	Do I have Enough Water for 2 Hours?	8	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/water/enough-water Complete math puzzle with the help of videos.	10
Secrets of the Desert	How do you Survive?	9	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/water/animal-water-sources Learn how animals have adapted to the availability of water in the desert.	10

Secrets of the Desert	What Not to Do	10	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/water/what-not-to-do Learn how to stay safe in the Sonoran Desert.	5
Secrets of the Desert	Animals Shapeshifters	11	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/shapeshifters/same-same Learn about how animals have adapted to the desert and draw an animal that has adapted to the heat.	10
Secrets of the Desert	Pack Rat Time Capsule	12	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/shapeshifters/packrat-time-capsule Learn about how pack rats have documented time.	10
Secrets of the Desert	Monsoons - Dust	13	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/weather/dust Learn about Haboobs and create a safety poster.	5
Secrets of the Desert	Monsoons - the Wash	13	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/weather/the-wash Learn about flash floods and create a safety poster.	5
Secrets of the Desert	Monsoons - Heat	13	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/weather/heat Learn about heat and create a safety poster.	5
Secrets of the Desert	Aquifer	14	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/underground/aquifer Learn about aquifers.	10
Secrets of the Desert	Water Catchment	15	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/underground/water-catchment Complete a math puzzle about water catchment and filling tanks.	10
Secrets of the Desert	Data Crunch	16-17	https://sites.google.com/mcdowellsonoran.org/secretsofthesonorandesert/what-do-you-know/word-search	10

			Complete a Word search of the words you have learned.	
Secrets of the Desert	Every Day is Earth Day	18	Learn what you can do to slow climate change.	10
Tipping the Scales	Native or Non-native?	2	Identify species that are native and non-native to the Sonoran Desert.	10
Tipping the Scales	Buffelgrass in the Desert	3-4	Compare the populations of buffelgrass and native desert plants over time and come up with possible answers for why we see the changes in the two populations.	15
Tipping the Scales	Climate or Weather?	9	Use what you know about climate and weather to decide whether each statement in the following conversation is talking about climate or weather.	5
Tipping the Scales	Changing the Climate	10-11	Use the graph to come up with possible effects of human activity on climate in the Sonoran Desert.	10
Tipping the Scales	An Unbalanced Ecosystem	12	Explain how climate change affects the Sonoran Desert ecosystem, including the survival of invasive species and keystone species.	20-30

Additional Resources

Here are additional resources if you would like to dive deeper with your students on any of the module topics.

Zooniverse: <https://help.zooniverse.org/>

Corridor Viability Project: https://www.mcdowellsonoran.org/wp-content/uploads/2020/01/Corridor-viability_Lipfert.pdf

Youth as Citizen Scientists: <https://stephanieschuttler.com/do-kids-make-good-citizen-scientists-discoveries-from-emammal-camera-traps-around-the-world/>
<https://www.mammalweb.org/en/community/schools>

Camera Trapping: <https://emammal.si.edu/system/files/emammallesson1.pdf>

Camera Trapping: https://491a2392-1cc6-42bd-89c1-700fcdbd19655.filesusr.com/ugd/f6b310_b2fdf71a26c04f1589f53d6c782070ff.pdf

Desert Safety: <https://uahs.arizona.edu/blog/2015-06-15/surviving-sonoran-desert-heat>

Desert Animals: <https://www.desertusa.com/survive.html>

Water Catchments: <https://wildlife.org/wild-cam-jwm-study-shows-troughs-aid-desert-animals/>

Climate Change for Kids <https://climatekids.nasa.gov/climate-change-meaning/>