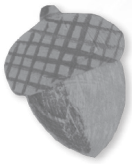
# PART I

# ELEMENTS OF THE NATIONAL PARK CLASSROOM



The ultimate purpose of the national parks is the education and inspiration of the people ... that idea infuses our entire cause from top to bottom. One of the destinies of our national parks, then, is to become the great school houses ... of this American people.

— ROBERT STERLING YARD


# 1

# NATIONAL PARKS AND OUR LEARNING LANDSCAPE

## CHAPTER HIGHLIGHTS

- National parks have played an important educational role since their inception, but more recently, their educational efforts have been more focused on school and teacher outreach.
- Park rangers are an excellent collaborative resource for teachers looking to supplement gaps in their content knowledge: Rangers know the content, and teachers know the learners.
- The National Park Classroom (NPC) model provides teachers with a roadmap for incorporating the educational approach used by rangers and parks into their classrooms in service of all learners.

**IT WAS 1888, AND CAPTAIN MOSES HARRIS** *of the 1st US Cavalry Regiment had a problem. It didn't involve requisitioning supplies, rounding up deserters, or ambushes by enemy soldiers; it was instead something that this battlefield veteran (who had been awarded the Medal of Honor for gallantry) felt wholly unprepared to tackle: tourist season.*

*Harris had been assigned to be the first military superintendent of the first national park in the history of the world: Yellowstone. Sixteen years after its establishment, more and more curious people were coming, but he had yet to receive the support he'd been promised to accommodate them. Time and again, he'd written to Washington, DC, but often his letters went unanswered. When his requests were fulfilled, the response was usually unequal to the task, such as the reinforcements he'd been promised totaling only fifteen infantrymen. But Harris made do with what he had, and he assigned his small staff to manage the ever-increasing number of tourists. The soldiers from the 22nd Infantry were assigned to the Upper Geyser Basin, home of Old Faithful and one of the most popular destinations in the park, a fact that holds true to this day.*

*Among the fifteen was Corporal Louis Hunter, second in command and who we can easily envision as being so hard-jawed and grizzled that the park's bears probably steered clear of him. However, looks can be deceiving, and thanks in part to long hours spent sitting around with little to do but read and wonder, he knew a lot about the park.*

*A letter penned by an early park visitor described the corporal interacting with a group of women who approached him as he stood guard among the erupting geothermal geysers and vents of the basin. One of the women asked if Old Faithful would erupt again, to which the corporal gruffly replied that he was not there to "answer a thousand and one fool questions." The woman, who had superb comic timing, inquired as to how many questions he might be willing to answer then? The corporal's jaw clenched, his eyes fixed on the woman whose friends probably started backing away as the soldier cleared his throat to reply, "It is not a part of my business to answer questions at all, BUT if you will keep still I will, without being questioned, explain all that is necessary for you to know."*

Thus began the earliest recorded formal educational program ever given to visitors in a national park, and despite Corporal Hunter's gruff demeanor, he apparently performed admirably, with the letter describing his lecture as "similar to a man who is shooting off a magic lantern," while the ladies making up his audience "assumed various awe-stricken poses" as he taught them all about the basin's amazing geothermal properties during what eventually became popularly known in Yellowstone as "cone talks."

## America's Largest Classrooms

> ***... these parks [are] the greatest of schools and playgrounds. No other school is likely to inspire children, so to give them vision and fire their imagination. Surely the children ought to have this extraordinary opportunity.***
>
> — ENOS MILLS

Learning has been part and parcel of national parks ever since their inception. Whether they were established because they contained the world's largest living organisms, its longest cave system, its greatest concentration of geothermal geysers, or because they are the location of some natural treasure or event of historical significance, every unit in the oldest, largest, and best national park system on the planet has an exceptional tale to tell. In his first official report as the first superintendent of the national park system, Stephen Mather reported that parks serve "as a medium for the furthering of knowledge" and that "one of the chief functions of national parks and monuments is to serve educational purposes."

Almost 100 years later, this sentiment is still being echoed and expanded upon. Yale professor Dr. Robin Winks said the national park system is "the largest university in the world," and that every unit "serves primarily an educational purpose." The NPS online educators' portal proudly proclaims to all visitors that parks are "America's largest classrooms," and in the 2016 National Park Service Centennial Act, education in the parks was mandated by Congress. Yet relatively few classroom teachers choose to leverage this immense resource in their classroom.

Access the NPS Educators portal here:
**nps.gov/teachers**

Throughout my career in education, whether I was in the classroom, presenting my work at conferences, or working with teachers across the country, I have often talked about how national parks can be assets that support classroom learning. This often produces raised eyebrows, as many classroom educators limit their

definition of what constitutes the educational system here in the US to what is commonly known as "formal" components: the network of districts, schools, and brick-and-mortar classrooms. But parks incorporate learning opportunities and resources accessible beyond lecture halls and elementary school playgrounds into a larger "learning ecosystem."

Our national learning ecosystem includes not only classrooms but also all "informal" parts of our educational ecosystem; libraries, museums, zoos, television, and, as much as it pains me to say so, even TikTok. In these informal spaces, learning often happens outside of school hours, unburdened by pacing guides, disruptive classmates, and bell schedules. What's more, the benefits of informal learning flow right back into the formal environment, benefitting both the learner and the teacher in many ways:

- It provides access to curriculum or content that would otherwise cost teachers their own time and, in most cases, their own money to produce.
- It creates avenues for teachers to connect subjects that students might think meaningless to an observable context or location, giving those subjects more meaning.
- It can help connect teachers to people who have content expertise at a level that they themselves have not developed.

The challenge with tapping this expanded learning ecosystem is that finding all these things requires what might be described as "the treasure hunt from hell," requiring a massive investment of the one finite resource teachers rarely seem to have—time. It would be nice if there was an expansive organization with an educational imperative where resources like those mentioned were easy to find and where teachers could access additional support at no additional cost. Wait a minute …

## National Parks for Beginners

> ***What a country chooses to save is what a country chooses to say about itself.***
>
> — MOLLIE BEATTIE

National parks in the US are a concept that stands in stark contrast to how parks developed in other parts of the world. As far back as ancient Persia, parks were places filled with natural features such as trees, flowers, and pathways, but set aside for only a small part of the populace. In Europe, parks were personal oases carved out of the choicest land for recreation and enjoyment. But they too were reserved for the exclusive enjoyment of royalty or the wealthy, with both groups threatening ruin or death upon any commoner who thought to trespass on what they viewed as theirs by right of riches or status. In most countries, parks were exclusive by design and enjoyed by few. A prime example of this is an area in Southern England known as the New Forest. In 1079, William the Conqueror, the newly minted King of England, designated this area as a royal hunting reserve and sent the residents packing.

While 90% of the land that makes up the New Forest is still technically owned by the Crown, management of the area was transferred to the New Forest Park Authority in 2005, when it was designated a national park. Power to the people!

The national park idea as it developed in the United States was a new notion. Here, the very best lands in the country are collectively owned by "We the People," managed in partnership with members of an elected government who are advised by the citizens and with the support of private industry to ensure that they remain preserved and accessible. It was a notion that was more reminiscent of the beliefs of Indigenous people that land is sacred, something that could not be owned and was instead a common resource that, when taken care of, takes care of its people in return. But like the country that invented them, the parks are fraught with contradictions. Often, they were the product of theft and, at times, were just as exclusionary as those in the old world. As journalist Juanita Greene said: "National parks are a symbol of democracy when it works well … at its best."

Acknowledging and learning from this past is another aspect of national parks that makes them different from those in other parts of the world. While some countries hide their most shameful moments or outright deny they ever happened, we put them on a pedestal. Places like the site of the Sand Creek massacre, the Japanese internment camp of Manzanar, or the slave markets along the Natchez Trace share the same status as Yellowstone, Acadia, or the Great Smoky Mountains, creating opportunities for learning, dialogue, and, hopefully, healing. As Dr. Martin Luther King Jr. said, "Darkness cannot drive out darkness, only light can do that."

Today in the United States, 428 national park units stretch across all 50 states and many of our territories. Each unit was set aside because something unique and remarkable sits within its boundaries. Maybe it's the site of a pivotal moment in the Civil Rights Movement or a place that provides access to a natural treasure of exceptional beauty or rarity. Whatever it might be, that unique and remarkable characteristic that resulted in its designation as a national park is something worth knowing more about, which is why so much time and energy has been put into the developing learning opportunities associated with them.

It is a fair bet that by the time you're reading this book, this number of national park units will no longer be accurate. The number of units increased by six just within the span of time when I was writing this book.

## Educators and Our National Parks

In 1916, the Organic Act was signed into law, creating the National Park Service (NPS) and naming Stephen Mather its first director. Mather was a visionary individual who understood something few of his contemporaries had the foresight to comprehend: The national park system was destined to grow, and its growth and longevity would be directly tied to the number of people who recognized their value. Mather knew that the quickest way to get people to become invested in a place was to help them understand why our parks are so incredible, and this required a focus on education. He felt so strongly about this that he personally hired the first educational director, paid him out of his own pocket, and when it was time to create an outline for the ideal visitor experience, item number two on that multi-point plan was the following: *"To further the view of national parks as classrooms and museums of nature."*

A TIMELINE

## EDUCATION IN OUR NATIONAL PARKS

**1886**
The first recorded educational programs inside parks are delivered by US Infantrymen stationed at Yellowstone, who answer visitor questions to pass the time.

**1902**
Future national military parks like Gettysburg, Antietam, and Vicksburg are utilized by the war department as "open air classrooms" to instruct officers and cadets in theory and military science.

**1918**
First NPS Director Stephan Mather establishes Parks Education Committee and funds the office with his own money.

**1925**
The Yosemite School of Field Natural History, the first "national park classroom," is established to provide learning opportunities for aspiring naturalists

**1929**
New NPS Educational Advisory Board codifies "interpretation" as the official educational approach used by park rangers and naturalists.

**1932**
The book *Research and Education in the National Parks* is published. It recounts the role that the educational mission of the parks has played in their development.

**1935**
The Historic Sites Act is passed by Congress, requiring development of educational programs focused on historic sites and properties.

**1940**
The Annual Ranger Conference held at the Grand Canyon recommends beginning outreach to schools and classrooms.

**1957**
Freeman Tilden publishes *Interpreting Our Heritage*, a foundational pedagogical text still studied by park rangers everywhere.

**1968**
As the environmental movement gains steam, the NPS helps create the National Environmental Education Development Program (NEED), which will inform the eventual design and adoption of the Next Generation Science Standards (NGSS).

**1994**
Online education portal nps.gov/teachers is launched.

**2006**
The report "Renewing our Educational Mission" is published. It emphasizes that the best way to engage "groups that have not been well connected to the parks" is through classroom outreach.

**2014**
Teacher-Ranger-Teacher program launched.

**2016**
President Obama signs the NPS Centennial Act into law, mandating educational programs in parks.

**FIGURE 1.1 >** Timeline of the gradual development of education in our national parks.

To learn more about the history of education in the parks, check out the book *America's Largest Classroom* by Jessica Thompson and Ana Houseal.

The question of why teachers should invest their time in understanding and incorporating national parks into their classrooms boils down to two important elements: position and collaboration. Both of these could, and have, changed the course of our nation's history.

### POSITION

In 1868 rural Kansas, a schoolboy in a prairie schoolhouse peeled away the newspaper from around his sandwich and read it while he ate. One article caught his attention: It was about the discovery of a mysterious sunken lake, deep in the remote mountains of Oregon, with water bluer than any other in the world. That boy later recalled, "In all my life, I had never read an article that took the intense hold on me that that one did, and then and there I determined to go to Oregon and visit that lake, and to go down to the water."

That boy in the classroom turned out to be William Gladstone Steel. Fifteen years later, he saw the lake and went on to spend untold hours and vast sums of his own money lobbying Congress to protect it from development. In 1902, the lake was designated Crater Lake National Park.

One article read by a kid in a Kansas classroom led to the establishment of a park that is now enjoyed by millions of people. Gladstone's story underscores the power of integrating parks into your classroom and teaching. If you don't invest the time to introduce your learners to the wonders of our world and teach them why

they are worth visiting and protecting, who will? We will return to this point later, but it's not an understatement to say that teachers are best positioned to serve as connector between our national parks and their next generation of stewards.

## COLLABORATION

The benefits of classroom education rooted in parks aren't limited to the learners alone. Teachers can also benefit professionally. National parks curate free resources that anyone in the world can leverage. They host professional development events that can help teachers progress in their understanding of complex topics. But perhaps the greatest assets national parks offer teachers are the more than 14,000 park rangers employed by the NPS. These rangers are seasoned educators in their own right, and no other group of people "gets" teacher struggles like park rangers.

Look at the table below, comparing park rangers and classroom teachers. I mean, they're practically the same people. But joking aside, rangers and teachers make natural collaborative partners who benefit from shared endeavors. The teachers I profile in this book have created amazing experiences for their learners, and in almost every case, they did so by collaborating with equally amazing park rangers.

When I visited the immense limestone cavern in Carlsbad Caverns National Park in southern New Mexico, I learned about its bats: Huge colonies of Brazilian free-tailed bats roost in the cave, and at about 28 minutes past sunset, they emerge from its depths, swirling out in a counter-clockwise spiral to hunt for insects.

I knew that this outflight was a not-to-be-missed experience, so I went to the evening program that preceded the flight, but I wasn't a bat fanatic. I don't dislike them; they just aren't my thing. However, the ranger hosting the program that night was a fan—a rabid fan, if you'll excuse the expression. His enthusiasm for all things flying mammal was so infectious that by

| PARK RANGER | CLASSROOM TEACHER |
|---|---|
| Professional who rarely enjoys the respect they deserve. | Professional who rarely enjoys the respect they deserve. |
| Has deep knowledge of content. | Has deep knowledge of learners. |
| Underpaid government employee. | Underpaid government employee. |
| Has many other duties assigned that they'd rather not have to do such as monitoring campgrounds, telling visitors to stop doing stupid stuff like petting bison, or parking lot duty. | Has many other duties assigned that they'd rather not have to do such as monitoring the lunchroom, telling students to stop posting stupid stuff on social media, or bus circle duty. |
| Gets asked a million questions a day that are clearly answered in the brochures they provide. | Gets asked a million questions a day that are clearly answered in the handouts they provide. |
| Often contends with wild animals. | Often contends with hormonal teenagers. |

the end of the program, I was ready to start my own bat fan club.

Park rangers like him spend all day every day immersed in resources that align with almost all curricular areas. The ranger at Carlsbad Cavern could wax philosophical about echolocation, the life cycle of the bat, its place in the food web of the Chihuahuan Desert, and the human activity that adversely affects the bats—all topics specific to national science standards at multiple grade levels. This depth of knowledge and enthusiasm is far beyond that of most teachers, who are often required to be knowledgeable in multiple curricular areas and don't always share the depth or interest in all science topics. Teachers can draw on the knowledge and resources of parks and rangers for the benefit of their learners, and in doing so, they can help rangers tailor that knowledge and those resources to a more diverse cross-section of learners more effectively, while simultaneously helping them meet their goals for educational programming. In short, while rangers know the content, teachers know the learners, and when the two work together, magic happens.

## The National Park Classroom: An Overview

In my introduction, I described my experience with national parks, which began with summertime visits with my family. The remarkable thing about those visits is even though many years have passed, I still remember quite a bit of what I learned. I remember that the oldest rocks in the Grand Canyon are about 1.8 million years old and that the granite that makes up the walls of the Yosemite Valley first formed deep underground, and that banana slugs like the ones my daughter held during our visit to the Olympic National Park are decomposers that play an essential role in the forest ecosystem. While facts like these proved useful during trivia night, it wasn't until I began my master's that they began paying dividends.

**FIGURE 1.2 >** My daughter Rose connecting with a resident of Olympic National Park.

I came across a compelling body of research that explained why, after such long periods of time, I still remembered what plutonic rock was or what banana slugs do. This knowledge was locked away because of how I had learned it. This knowledge was rooted by connecting to a place, through the real-life work of real people, and because they provoked my curiosity and drive to learn and retain more. I learned that the approach to education utilized by parks across the country is effective, backed up by a large body of research, and reflects a lot of what classroom teachers would recognize as "best practice."

The benefits that I saw in my classroom when I "taught like a ranger" were immediately apparent, and I wanted my colleagues to be able to adopt some of the strategies as well. This

proved to be a lot more difficult than I anticipated. When I tried to share how the education techniques I used on the weekends could work in a classroom, there was more confusion than interest. In 2018, I was invited to present at a national conference, and the reaction I got there could be described as lackluster. Comments from my attendees included things like:

"I would love to be able to teach using national parks, but I don't like camping." *Who said anything about camping?*

"Would love to try this, but I live in Pennsylvania, and we don't have national parks." *There are 19 national parks in your state, and one has a big freaking bell that you might have heard of before …*

"The resources included in your presentation were developed by park rangers and not teachers, so I can't use them." *Mr. Rogers didn't have a credential either, yet I learned all kinds of stuff from him …*

These early failures left me with fun quotes and a big question: *How could I distill what education in parks looks like in a way that makes it more accessible to classroom teachers?*

This is what I intend to lay out in the first section of this book: the model I call the National Park Classroom. The NPC model, which is laid out in the image below, consists of six elements that help translate public lands processes, practices, and resources into the classroom.

While this model has yet to be the subject of an exhaustive study by a major university, my own observations have shown me that projects that integrate these elements result in success by many measures. But don't take my word for it. Like the Grand Canyon, seeing is believing, and what follows are just two examples of what can

**THE ELEMENTS OF A NATIONAL PARK CLASSROOM**

**INTERPRETIVE TEACHING**

Adapting the instructional techniques used by park rangers for inside the classroom.

**PROJECT DESIGN**

Developing learning experiences rooted in authentic connections between classroom content and our park system that have real-world uses.

**EXPLORATORY INQUIRY**

A learner-centered approach to education emphasizing agency in discovering the answers to self-generated questions.

**CAMPFIRE CULTURE**

An approach to class management informed by visitor experience planning.

**EQUITY FOCUSED**

Incorporating diverse perspectives and introducing lost narratives in service of driving the learning.

**PLACE CONSCIOUSNESS**

Using resources from the local community to contextualize, not just classroom lessons and the resources within our national parks.

be achieved by integrating our public lands into a classroom context.

## The NPC Model in Action

> ***I sauntered about from rock to rock … I asked the boulders where they had been and whither they were going.***
>
> — JOHN MUIR

National parks are showrooms of geology. The hoodoos of Bryce Canyon, the immense stone arch of Rainbow Bridge, and the extinct cinder cone of the Capulin Volcano are visible proof of cryptic processes that progress on such an enormous timescale they are generally impossible to observe in action. When you visit these places, you are looking back thousands, if not millions, of years, and yet many teenagers have yet to visit one of "their" national parks and see these amazing features in person.

Challenges like this are nothing new to Columbus, Ohio area middle school teacher Josh Flory. Over the course of his career, Josh has visited many national parks, been a member of the Cuyahoga Valley National Park Teacher Network, participated with fellow educators in grant-funded work in parks like Olympic, and in a past life, worked for the Ohio Division of Tourism, showcasing the wonders of the Buckeye State. With all this experience, creating a project focused on engaging his teenage learners with the parks he loves seemed like a no-brainer. In 2015, he launched an ambitious project to better tie his geology unit to the 2016 NPS centennial celebration. He framed it not as something his learners were doing to earn letter grades, but as a way for them—as part-owners of these places—to embrace their role as caretakers and make an impact outside of the classroom.

As part of this caretaker role, the learners in his class all "adopted" a national park and used it as a lens to answer the following Anchor Question: "How can we inspire teenagers to connect with and protect the amazing geology in our national parks?" Their answer was an expansive book that details not just the geologic forces at play in their parks but also related opportunities for teens like themselves to enjoy seeing these geologic forces in action in the parks. The teens also designed visitor experiences aimed at helping the public better understand these complex topics.

To do this, they had to first gain an understanding of earth science concepts like plate tectonics and search for evidence of them in their parks. They participated in different activities, conducted research, and even corresponded with rangers from their parks, incorporating what they learned into their project.

An overview of the Stories in Stone project can be viewed here: **bit.ly/3N1nO4s**

As the final product took shape, Josh reached out to the NPS, thinking that someone in the organization might be interested in his project and could help share it so other educators could replicate it. It did pique the interest of someone: NPS Director Jon Jarvis was so impressed by what he saw that he personally visited Josh's classroom and sat in the audience for the final group presentations. Jarvis provided feedback on the visitor experience designs for each group and, in a moment reminiscent of Oprah's talk show, announced that in recognition of the students' work, he was arranging a special VIP trip to nearby Hopewell Culture National Historical

Park not just for them, but for the entire grade level—all 300 students.

If you have the director of the NPS walk through your classroom door and take an active role in your national park project, then it's safe to label it a success, but what truly made it a success was Josh's willingness to embrace the unknown and try: "You can either create a 'recipe project' that is safe and everything is ready to go, or you can use PBL, embrace some more unknowns, and then go for it!"

Saying that the drive into Mesa Verde National Park is a long one would be an understatement. Located in a remote corner of Colorado, the journey can take hours by car, so having something to pass the time is a very good idea. San Diego, California teacher Michelle Jaconette, already a seasoned traveler, knew what to expect, so prior to tackling the long, winding park road, she downloaded an audio companion available at the park's visitor center. It was a collaboration between the park and members of some of the 26 Indigenous tribes whose people are linked to this sacred place.

The Mesa Verde audio tour of Indigenous history is available here:
**bit.ly/3N2hry4**

The tour and the ample thinking time provided by the road trip got Michelle thinking that her own class of fourth graders at High Tech Elementary could do the same thing. As she drove back toward Denver, the outline of her next project-based endeavor began to take shape.

Initially, Michelle thought that creating a student-produced audio guide to the national parks would produce the best evidence of learning. But like many good PBL projects, Michelle's idea morphed into something completely different as her learners began to take ownership of the project. As they researched topics like geology, Indigenous history, and the recreational opportunities for kids their age, they began to have their own ideas of how best to make their learning accessible. Their inquiry progressed into questions like, "How do we make our work more public?" and, "What's the best format for sharing our learning for traveling families?" which led the students to their eventual final product: a self-published guidebook, complete with original watercolors, written for students by students that is available for purchase on Amazon.

Get your own copy of the guidebook here through Amazon print on demand:
**amzn.to/3XExOpq**

And just in case you're convinced that stories like this are just "one-offs" or the result of lucky circumstances, hold that thought. The following year, Michelle did it again with another group of students, who created a coloring book with helpful introductions to the science behind scenery captured by the student illustrators. This second work, a project that was unique but still incorporated her learners' love of art, was completed with the support of a local artist whose collaboration enriched the process and helped reinforce the authentic nature of what they were doing.

Get the coloring book here and leave the kids a five-star review:
**amzn.to/3zmzpbm**

While the books by themselves would be a fitting culmination for such a stellar ELA/Science/History project, it was just the crescendo, not the climax. That was reserved for the overnight camping trip the entire fourth grade got to take to Joshua Tree National Park. The students were able to put their new skills as park guides to the test, and many of her learners, who had never visited a park before, were able to reframe their thinking about what the outdoors is and how much fun can be had in it. The visit allowed them to engage in a shared experience as classmates that could be discussed back in their classroom. They were also able to link the visit to future learning in the areas of science through the ranger-led programs. The learners who had never been camping thrived in the outdoors, even when a rainstorm required the group to pack it in early—and that was only because the parent chaperones asked to quit.

But what were the design choices that Josh made that resulted in the success he and his learners experienced? How did Michelle facilitate the process that led from her epiphany at Mesa Verde to her students becoming published Amazon authors at age nine? Those questions are what we will answer in the following chapters.

## Additional Reading

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Picathely, D. (2002). *National parks and education: the first twenty years*. The National Park Service. bit.ly/3Zzc4Oe

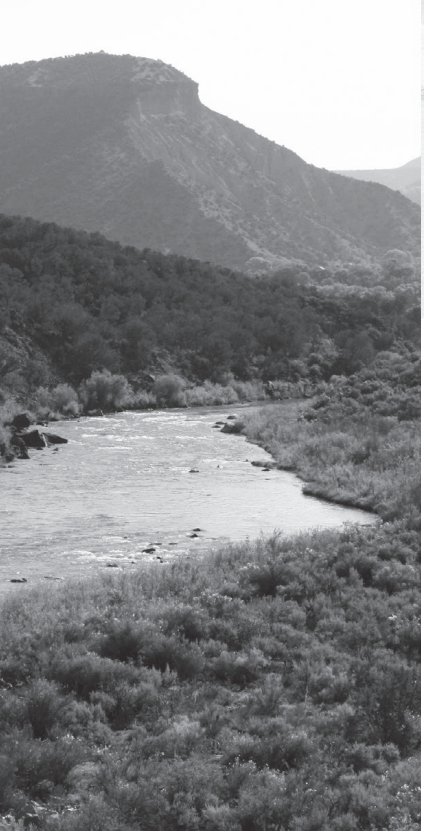
Washburn, J. (2020). Dynamic learning landscapes: The evolution of education in our national parks. *Parks Stewardship Forum, 36*(2). http://dx.doi.org/10.5070/P536248265

# PART II

## HOW TO
# CREATE ENGAGING LEARNING EXPERIENCES

If future generations are to remember us with gratitude rather than contempt, we must leave them something more than the miracles of technology. We must leave them a glimpse of the world as it was in the beginning, not just after we got through with it.

— PRESIDENT LYNDON BAINES JOHNSON,
DEDICATING ASSATEAGUE ISLAND NATIONAL SEASHORE




# 8

# THE DESIGN TRAIL

## CHAPTER HIGHLIGHTS

- Always begin your projects with the end in mind: What do you want your learners to know by the end of the project? What are you hoping they experience? What location are you hoping to make them feel more connected to?
- National parks can save you lots of time by connecting you with resources that can be leveraged during the project process, but make sure to consider sources of resources from outside the NPS as well.

**IN JANUARY 2020, NEW RIVER GORGE NATIONAL RIVER** *in the Appalachian Mountains was redesignated by Congress as a national park. While politicians touted this move as a way to "shine a brighter light on West Virginia and all that it has to offer," not everyone was ready to celebrate. Some locals were skeptical, worried that the expected increase in tourism dollars due to this new designation wouldn't trickle down to them or their community. In the community of Ansted, West Virginia, twelve minutes north of the park's iconic New River Bridge, a sixth-grade science teacher named Kennedy Moore decided to make sure that the economic benefits were felt "North of the New."*

*In 2023, Kennedy and her colleagues designed an interdisciplinary project for her students, focused on making sure park visitors were aware of what communities like hers had to offer. The students would learn about the park's human and natural history and leverage that knowledge to highlight connections between park attractions and the offerings of Ansted, West Virginia.*

*After building their background knowledge through in-person visits, academic lessons, and collaboration with park rangers, Mrs. Moore's students developed a plan they were sure would help local businesses and attractions capture the interest of visitors. They were so sure that they reached out to national park rangers, local business owners, and representatives from the*

*Town of Ansted to provide feedback on their plans. Word of the students' idea found its way to the New River Gorge Convention and Visitors Bureau, which reached out to the school and picked up the project right away!*

*The proposed plan consisted of a passport-style book that encouraged visits to sites around Ansted by promising a culminating prize. The idea was received with enthusiasm, and soon Mrs. Moore's class found themselves in a meeting with community business leaders, who asked the middle school learners for advice on how to encourage further visitorship.*

*The project resulted in success in both the academic and real-world realms: Project participants demonstrated increased proficiency on state mathematics assessments, and the work they did informed ongoing outreach efforts that resulted in economic opportunity for their community. The passport activity they developed, available in the national park's visitor center and local businesses, is also being adapted by the West Virginia tourism board to help shine a light on their state's new offerings.*

If you can't make it to New River Gorge yourself, you can see a digital scan of the project here: **bit.ly/3OOPnPC**

The work Kennedy and her learners accomplished in service of their community and the national park next door was remarkable for many reasons: It gave her learners command of their own learning; it allowed them a chance to connect a place to the content they were learning; and it showed them that the knowledge and skills they were developing could have an immediate real-world impact. All these things were the result of not just her inclusion of NPC elements, but also because of the way that the project was designed.

In chapter 2 of this book, I shared why Project Design is so important for creating space for learner-centered education and how to begin the process. In this chapter, I will share the rest of the process you can use to integrate the NPC model into seamless project experiences.

## The Project Design Trail

Just a few miles from the Pennsylvania/Maryland border sits one of our nation's most well-known national parks: Gettysburg National Military Park. Over one million visitors come here annually to walk the battlefield, learn about the importance of the park within the larger scope of the Civil War, and contemplate themes like bravery, sacrifice, and freedom. But most visitors are unaware that just ten minutes down the road sits another smaller national park unit that interprets the life of the 34th president of the United States, Dwight D. Eisenhower.

During a tour of the Eisenhower family home, a park ranger shared a quote from old Ike that resonated with the teacher in me:

> ***Plans are worthless; planning is everything.***

The quote was meant to draw a distinction between the importance of planning and its limitations, something classroom teachers understand very well. You can plan all you want and create the most detailed, differentiated lesson you possibly can, but things you didn't anticipate are bound to come up. That may make you think that planning isn't worthwhile, but the more developed your plan, the more easily you can pivot when the unknown rears its ugly head. The process I am about to share with you is a tried-and-true method I've used to help hundreds of teachers account for all the essentials

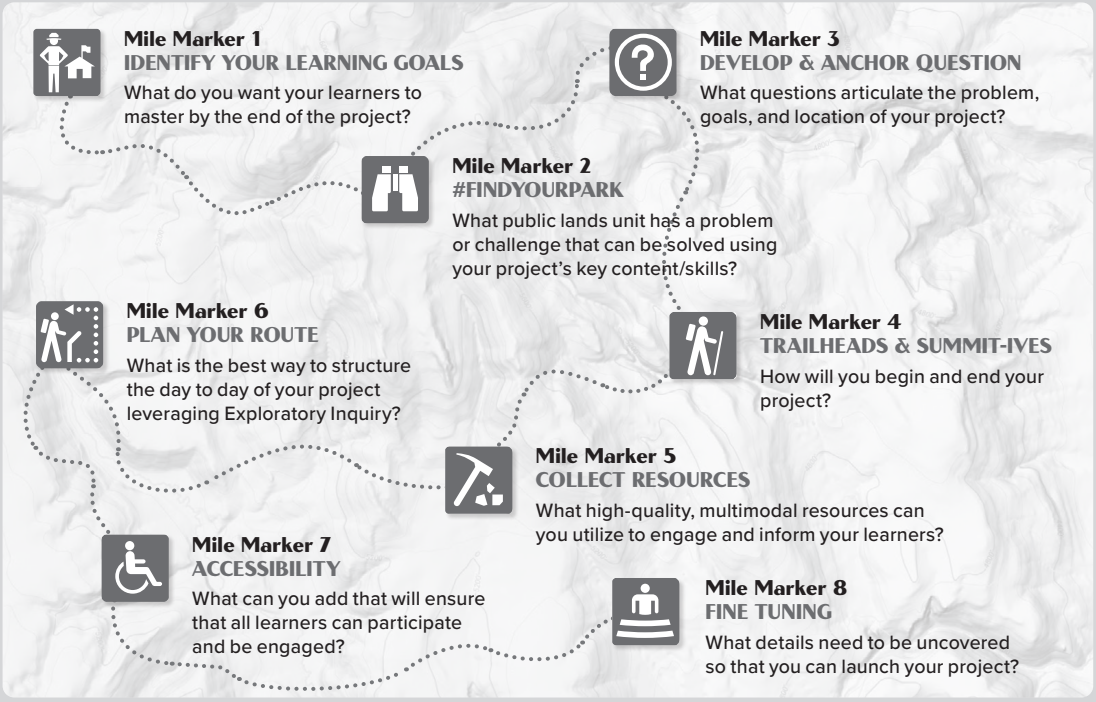
that lead to impactful and empowering projects: The Project Design Trail.

You'll see me referring to the outcome of this planning process as a "project," but while this process is designed with the creation of longer units or projects in mind, it is adaptable and can be implemented to create shorter instructional sequences as well.

Whether you are preparing to invade Fortress Europe or preparing your first project for a class of eighth grade rapscallions (and I'm not saying which is the more perilous endeavor), you need a planning process that accounts for as many essential components as possible. That is what we will discuss in this chapter: a clear and easy-to-follow planning process informed by research and many years of personal experience designing curriculum alongside teachers from around the world. Previously, we have discussed what each of the NPC elements look like in the context of the classroom, but now we're going to explore what it looks like when you tie them all together seamlessly using the elements of project-based design we outlined in chapter 2.

Research done on the hallmarks of strong curricular design has found certain elements to be essential in the creation of units/projects that deliver high academic outcomes.

## PROJECT DESIGN TRAIL: PLANNING PATHWAY



***Clear Purpose.*** Providing learners with a clear purpose for the learning is fundamental for engagement and is based on the science of learning. Learners should understand not just what they will be expected to learn but why as well.

***Authenticity.*** Connecting the learning in the classroom to the world outside. Authentic context for learning builds in the relevancy that helps students take in new knowledge and construct understanding.

***Collaboration.*** Using group/team structures helps students navigate interpersonal dynamics. Creating opportunities for learners to manage their processes in the context of group work builds agency and helps create community.

***Assessment.*** Ongoing, authentic, and performance-based checks for understanding need to be embedded throughout the process. Learners should have the opportunity to self-assess as well as receive feedback from others (LER 2022).

The Project Design Trail incorporates each of these, ensuring that the projects you build for your learners create the conditions for high-level outcomes. However, if you don't want these projects to end up being "one more thing" on your plate, make sure to start with the end in mind: your learning goals. Let's begin by reviewing a couple of the steps outlined in chapter 2.

## MILE MARKER 1: IDENTIFY YOUR LEARNING GOALS

Since its launch in the late 1990s, recreation.gov has been the go-to website for making reservations at national parks. Whether you're looking for camping, rafting permits, or cave tours, the website provides access to most park adventures for visitors, but after several decades of use, it was clear that a refresh was needed. The project's leader, Rick DeLappe, had a good piece of advice for his team: Begin with the end user in mind. He made sure that the focus of the work each day began and ended with their original goal of an improved user experience so that they didn't waste time they didn't have.

Your project needs to work for you. It needs to teach and assess standards, content, or learning goals that you are required to cover. From the outset, you'll want to identify the standards and skills your project will both teach and assess.

This approach is highlighted in the work of Grant Wiggins and Jay McTighe, who assert that considering learning objectives in advance of activities and instruction puts the focus on the learning rather than the teaching (Wiggins and McTighe, 1998). Incidentally, park rangers follow this same design philosophy as they consider the universal themes of their interpretive talks well before they look for park resources and techniques that can be used to illustrate them.

When considering what learning goals you might plan around, an essential consideration is the potential real-world connections. Not all learning goals have real-world connections that are engaging to your learners or that they would want to explore more deeply. You want to make sure that the goals can be contextualized in the real world. It's all the better if you can make a preliminary connection to a specific park unit at this point, especially if you want to incorporate an in-person or virtual visit, as this will aid a later step of the process.

Kennedy knew from the outset that her project would focus on New River Gorge National Park, so her search for appropriate learning goals was done through the lens of the park. This helped her and her colleagues refine her list of potential

standards to the areas of science (watershed health, human impact, and the iconic bridge), math (visitor statistics and budgeting), and persuasive and informational writing (describing the offerings of their community and persuading tourists to visit).

### MILE MARKER 2: #FINDYOURPARK

As we mentioned in chapter 5, a strong connection to a specific park unit or location is core to authentic contextualization of content and to helping address the equity gaps present among parkgoers. You might already have your park in mind when you begin planning your project, so sometimes, as in the case of Kennedy and her class, this step takes place simultaneously with the previous one. However, once you've found your project location, there are still considerations to make that will help you determine if it can meet your instructional needs:

- Exemplary phenomena. Are they specifically well-known as being the "best example" of one particular thing? Erosion? A specific ecosystem? Do they enshrine someone connected to a particular literary movement?
- Inclusive narratives. Are there places to connect the park to the cultures or lived experiences of all your students? Do a little digging to see if you can find it. A good place to start is the "People" section of the park's official NPS website.
- Educational offerings. Look for parks with educational offerings that go beyond simple in-person field experiences. Do they provide distance learning opportunities? Do they have an official partner that might supplement what the park offers?

One often overlooked area is the potential of parks to provide outsider expertise. Park rangers can be unparalleled sources of expertise, and their inclusion can potentially bolster student engagement in otherwise dry or abstract material or motivate students to perform well in order to follow similar career paths (Fisher 2015). More specific to the NPC mission, a personal connection to a ranger could be enough to convince students that parks are worth investing in and exploring later in life.

While you may have an idea of where outside expertise would best benefit your learners or the project, experts may not always be available when you need them. Therefore, it is important to consider all the ways you could utilize someone willing to collaborate with you, regardless of when they might be free. Outside expertise is beneficial ANY time, as illustrated by the table below:

| | |
|---|---|
| **BEGINNING OF PROJECT** | ◆ Trailhead kick-off<br>◆ Mini-lesson or presentation of knowledge<br>◆ Providing resources to students |
| **MIDDLE OF PROJECT** | ◆ Feedback on products<br>◆ Mini-lesson or presentation of knowledge<br>◆ Providing resources to students |
| **END OF PROJECT** | ◆ Final assessment or authentic audience<br>◆ Project revision partner |

Outside experts can support a project no matter when they are available. If possible, invite them to come back multiple times so they can see the work progress and give more informed feedback.

And don't forget, there is power in asking. If you don't have connections to a person or at a park that is perfectly aligned with your content focus, don't worry. Remember that the NPS is mission-directed to collaborate with educators and find ways of connecting learners to parks, so your cold-calling a visitor center might be a godsend for a park ranger who has no idea how to create inroads into educational spaces.

When I taught American History in California, finding authentic opportunities for students to connect with outside resources in our community was tough because so much of the content revolved around events and places on the other side of the continent. So, I made a list of park sites that connected to the topics we would study in our unit on colonial life and began calling all the parks. Most weren't interested in participating in my project, but then I got lucky and spoke with Ranger Sarah at Ninety Six National Historic Site in South Carolina. The site interprets not just the American Revolution battle that took place there but the life of 18th-century colonists and Indigenous people who lived there, making it a perfect fit for our unit. At the time, Ninety Six had no formal distance-learning program and few resources for educators outside of their immediate area, but upon hearing my hope, Sarah agreed to use her own cell phone to take my students on a video tour of the visitor center and answer their questions about everyday life in colonial America. And if that wasn't lucky enough, she and her rangers did it in the middle of cleaning up from a historic flooding event where her park received more than 20 inches of rain from Hurricane Joaquin!

In Kennedy's project, she hit the jackpot, in part due to her proximity to the park. A ranger was able to visit her class once a week for over a month to teach her students about the New River watershed, contextualizing science concepts and providing her learners multiple opportunities to get questions answered. Make calling a park part of your process and don't be shy about laying it on thick by reminding park staff, "This is for the kids."

### MILE MARKER #3: DEVELOP AN ANCHOR QUESTION

With your learning goals set and park site selected, you should be able to use the process outlined at the end of chapter 2 to write a clear, concise, and park-specific Anchor Question (AQ). This question guides and drives the learning, providing an important reference for all learning activities during the project.

One consideration you might want to make is the role of learners in helping to generate this question. Deeper learning occurs when learners are challenged to generalize and elaborate on learning goals—a hallmark of question generation (Ebersbach 2020). As such, you might want to consider engaging learners in the construction of the AQ using one of the techniques below:

- Share some of the details of the project, such as a short summary of the challenge, the summative product, and key resources such as a park website or short article. Allow learners to then brainstorm and share possible questions that could encompass the information.
- Allow learners to conduct a short "research sprint," in which they spend five minutes researching the park, the challenge, or a short list of resources you've curated, such as any news stories written about it. At the end of the sprint, ask them to share what they

learned and what questions the experience provoked for them. Try to coach them toward one that is similar to the intent of your project. (For example, "Was anyone wondering …" or "Did anyone see anything about …" are good guiding questions to ask.)

- Use poster paper or individual slides in a shared slideshow to draft several potential AQs, then ask learners to conduct a gallery walk of the options and share their reactions. They can rank them and provide their reasoning, add stars or annotations to the most intriguing ones, or suggest revision that might make them more compelling.

If you can frame the project's purpose in a way that invites participation, that energy will continue into the rest of the process. ACE practitioners follow this same method of ensuring that the thematic questions they share connect to the audience through a combination of broad topical focus and inviting visitors to participate early on through low-stakes invitations and easy-to-answer prompts. Asking your learners to weigh in on the primary focal point of the project is a powerful statement of your shared responsibilities and provides them engagement in the process and content of the class. (Dabrowski & Marshall 2018).

AQs also present opportunities for reinforcing place-consciousness. Unlike a more traditional essential question or driving question, AQs clearly articulate a place connection that helps give form to other ambiguous concepts.

Kennedy and her collaborators chose the following AQ for her project: "How can we showcase the local community to pull the economic benefit of the New River Gorge National Park to areas 'North of the New' through a marketing campaign?" According to the criteria used by both classroom and ACE practitioners, the question meets many important criteria, such as being complex, open to exploration, rooted in issues facing the community, and requiring supportive evidence to answer.

### MILE MARKER #4: TRAILHEADS AND SUMMIT-IVES

> ***There is no such thing as bad weather, just poor planning.***
>
> — UNNAMED ALPINE CLIMBER

As a veteran of many long-distance hikes and backpacking trips, I can attest to the truth of the following statement: You need to know both your starting point and your destination before you can plan your route. The same is true of projects, as both elements inform the eventual learning path that develops.

Teachers familiar with phenomenon-based learning understand the power of leading lessons with illustrative examples. Not only do they encourage further investigation, they also prime a learner's metacognitive abilities, allowing them to find connections more easily between unassociated sources of information (Akkas & Eker 2021).

A project begins at the same point as a hike: a trailhead. This initial event serves several purposes:

- Acts as a hook, provoking curiosity in learners and getting them to ask questions.
- Shares basic information about the project, like key details and expectations, to help learners move past surface-level questions to deeper questions.
- Hints at important connections, such as the location at the heart of the project or the challenge learners will have to uncover.

Trailhead activities can take many forms, so here are a few possibilities that you could consider integrating into your project:

- Field excursion
- Virtual museum visit
- Provocative reading
- Short video
- Mock correspondence
- Gallery walk
- Discussion
- Collection of statistics
- Guest speaker presentations

Once the launch has been solidified, it's time to focus on the destination. What will the task or culminating product look like? Even if looking all the way to the end of the project feels premature, it makes sense. Wiggins and McTighe would agree that the time to decide on your final product should take place after your learning objectives have been solidified so you can determine what acceptable evidence of mastery would look like.

The final product, or "summit-ive," should be something that makes an impact outside of the classroom, not something that is only destined for your file cabinet or, as my friend and colleague Dr. Krystal Diaz often refers to them, "dumpster projects," meaning they exist only to be graded, then into the garbage they go. When learners know that their work means something and has a real impact, they are more willing to acknowledge its value and intellectual challenge and spend more time on-task in class working to complete it (Barr et al. 2022).

Below are examples of real-world products that can provide evidence of content mastery while potentially benefiting partners like parks.

- Public event
- Research report
- Oral defense
- Podcast
- Field guide/brochure
- Photo essay
- Museum exhibit
- Business plan
- Publication

You might not think your learners' work is worth offering to parks, but a visit to Poverty Point National Monument in northern Louisiana proved that even student work is sometimes more professional than what parks have time to produce. This park preserves a collection of earthworks, the remains of a once-thriving ceremonial and trade center that some historians consider to be North America's oldest city. In 1994, it was designated a UNESCO World Heritage Site, a designation we will come back to later, putting it on the same level of importance as the Taj Mahal, Petra, and the Pyramids of Giza.

Given the significance bestowed upon this site, you would think the materials provided to visitors would be something to write home about, but you'd be wrong. When I visited, I was given a self-guided tour brochure that was nothing more than some basic information printed on a single sheet of inkjet paper folded in half. All I could think about when handed this laughable "World Heritage" resource was how my students could create something for the park that would be miles above what the park had to offer.

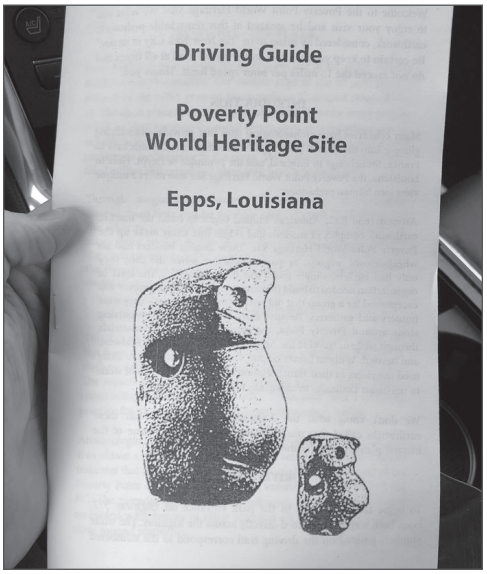



**FIGURE 8.2 >** The actual guide provided to visitors at Poverty Point, a national monument and UNESCO World Heritage Site.

In the case of Kennedy's classroom, some of the products the students created were pitched to professional organizations and utilized by real people. Their work meant something to other people, and therefore, it meant something to the learners, resulting in high-quality work.

**FIGURE 8.3 >** Student designed souvenirs created during the "North of the New" Project.

## MILE MARKER #5: COLLECT RESOURCES

In chapter 4, we discussed how Exploratory Inquiry relies on a combination of Stops and Segues, and while your learners will uncover a good number of resources during their own inquiry and research, you won't want to leave this entirely up to them. For one thing, it is a time-consuming process, and for another, you can never be too sure about what they will stumble upon when searching the vast black hole that is the internet. Providing high-quality resources to act as foundational sources up front is always a good idea, and usually national parks have a large repository you can draw from. You can discover what they might have by searching nps.gov/teachers, or you can call or visit them yourself and ask what they have as far as educator materials. I make a point of asking this at every state and national park I visit, and over the years I've amassed a dense collection of print and electronic resources I can draw from when creating projects.

Here is a selection of the best of what I have collected in my visits to more than 300 parks: **bit.ly/3MWWILY**

Curating resources is not just an important time saver, it's also an early opportunity to scaffold for your learners. Multimedia content in the form of recorded videos makes content that might otherwise come from live lectures more coherent for learners and allows them to review and revisit things that they might miss in the moment (Noetel et al. 2021).

Resources should be diverse in both format and representation. If you can find resources reflective of the learners in your classroom, all the better. One such resource you can pull from is

the OutSCIder Classroom, a project led by classroom teacher and national park explorer Chris Anderson. Chris traveled the country visiting national parks to create lesson plans focused on different science and history topics, and, in the process, interviewed an amazing cast of scientists and cultural experts, the vast majority of whom are POC.

You can search through and preview all the resources on the OutSCIder Classroom website here: **bit.ly/47HOxwq**

### MILE MARKER #6: PLAN YOUR ROUTE

One of the biggest benefits of a solid project plan is that it helps you use your time efficiently. Every classroom teacher has encountered this issue: There just doesn't seem to be enough time to get it all done. This is often how I feel when I get the opportunity to visit a national park, especially when I am doing so within the context of a work trip. When I was working in Arkansas, I of course had to make sure that I stopped by Hot Springs National Park, but my work commitments only allowed me a few hours to visit. To make the most of my trip, I tried to research the "can't miss" spots and built my itinerary around them.

This is the same principle I would suggest when you begin to flesh out your project. When you think about what you want your learners to experience, what are the "can't miss" moments between the trailhead activity and the summit-ive at the conclusion? Here is a short list of possible learning activities that might qualify:

- Visits from guest speakers
- Experiential activities such as labs or field trips
- Practicing final presentations or getting feedback
- Writing a mini-report or other forms of assessment
- Analyzing an article or other reading
- Conducting an interview

Identifying how your learners will develop their knowledge helps flesh out the rest of the project because each of these learning opportunities should be coupled with an opportunity to apply what they have learned toward the completion of the summit-ive, and some sort of assessment of that work. These "Learn-Do-Assess" cycles are what you will then use to build out your project calendar.

An additional consideration to make, especially in the service of making room for learner-led Exploratory Inquiry, is to ensure that within your plan, you account for "the unaccountable" that could cause you to deviate from your plan. In the case of Hot Springs, I had planned on making time to tour historic Bath Houses Row and to take a hike on part of the Sunset Trail, but I hadn't set aside time to enjoy unexpected discoveries, such as an entire historic trail devoted to baseball history. Make sure that while planning out your project, you incorporate time for the unexpected. Maybe one of your activities will take longer to complete than you anticipate. You might have to reschedule a video chat with a park ranger because of poor internet access. Maybe there's a freak snow day. If you set aside a couple extra days, you can absorb these events without having to compromise your larger vision.

Kennedy probably anticipated that parts of the project, such as her class visit to the park, could have potentially been postponed due to the

weather or some other complication, so considering contingencies would no doubt have been part of her larger project planning process.

### MILE MARKER #7: ACCESSIBILITY

Our national parks should not be available to "just some" people, so it makes sense that projects incorporating them should not be experiences for "just some" of your learners. All your learners should have the opportunity to engage in complex, rigorous, and engaging projects, and all learners are unique in their own way with different areas of strength need. Some challenges might prevent them from engaging fully in certain aspects of the projects you are designing. Considering what adjustments and scaffolding you might need to include is an important step along the Design Trail, but it is also one that can become a serious time suck if you don't approach it the correct way.

While working in Boston, I got an opportunity to visit John F. Kennedy National Historic Site, which preserves the home that President Kennedy was born in and lived in when he was a child. My visit came on the heels of a huge renovation that sought not just to better preserve the house but also to make it more accessible for anyone who might want to visit. A park ranger detailed the immense amount of planning that went into the accessibility features, but the array of potential needs and the ability to create only one plan meant that they needed a design framework that was as effective and as broad as possible.

To achieve this, the park staff considered the needs of the visitors who had the greatest accessibility requirements and planned around accommodating them. This resulted in a master plan that included elevators for people in wheelchairs, audio elements and tour brochures in braille for those with vision issues, and a variety of print materials for those who might have hearing impairments.

The strategy employed by the staff at John F. Kennedy National Historic Site was informed by Universal Design (UD), a concept used in architecture to ensure equal access to people with disabilities. This idea was adapted in the education space to create Universal Design for Learning (UDL), an instructional approach to lesson design in which the teacher responds to learner variability by considering the learners who have the greatest need (MGIEP 2022). By designing lessons with those students in mind, lessons become more accessible to a greater range of learners.

You can apply this same design mentality to your projects to avoid having to create scaffolding for every individual learner. Instead, consider the learners with the greatest needs and design the project to meet them where they are.

### MILE MARKER #8: FINE TUNING

By the time you are nearing the end of the Design Trail, you will have completed the bulk of your planning. The last part of the process involves making little tweaks and adjustments based on your own assessment and the observations of others. Prior to launching, it is always a good idea to share your project with other educators who can provide you with a different perspective and point out opportunities you might have missed.

Many parts of the project could use attention during the fine-tuning portion, and many are related to management decisions you might make to help your learners work more effectively and independently. Because the number

of considerations can be lengthy, here are ten common tune-up areas you should always consider before beginning a new project:

- Where will you find an authentic audience for your learners' final presentations?
- What aspects of the project should be included on the rubric?
- Alongside subject-matter content, what skills can you teach and assess through your project?
- What parts will you allow your learners to assess, and what parts will you need to assess?
- If you aren't able to visit your park in person, how can you create a strong connection to it?
- What activities will you lead, and what activities will you have your learners lead?
- Is there a balance between teacher-centered and learner-centered activities?
- Are there any aspects of the project that might require administrator approval?
- If interest or engagement begins to dip, how will you recapture it?
- How will you form your project groups?

## Additional Reading

Lucas Education Research. (2022). *Designing project-based learning curricula: Leveraging curricular development for deeper and more equitable learning.* George Lucas Educational Foundation.

UNESCO MGIEP. (2022). *Applying universal design for learning.* The Digital Teacher course.

Wiggins, G., & McTighe, J. (1998). *Understanding by design*. ASCD.

# INDEX