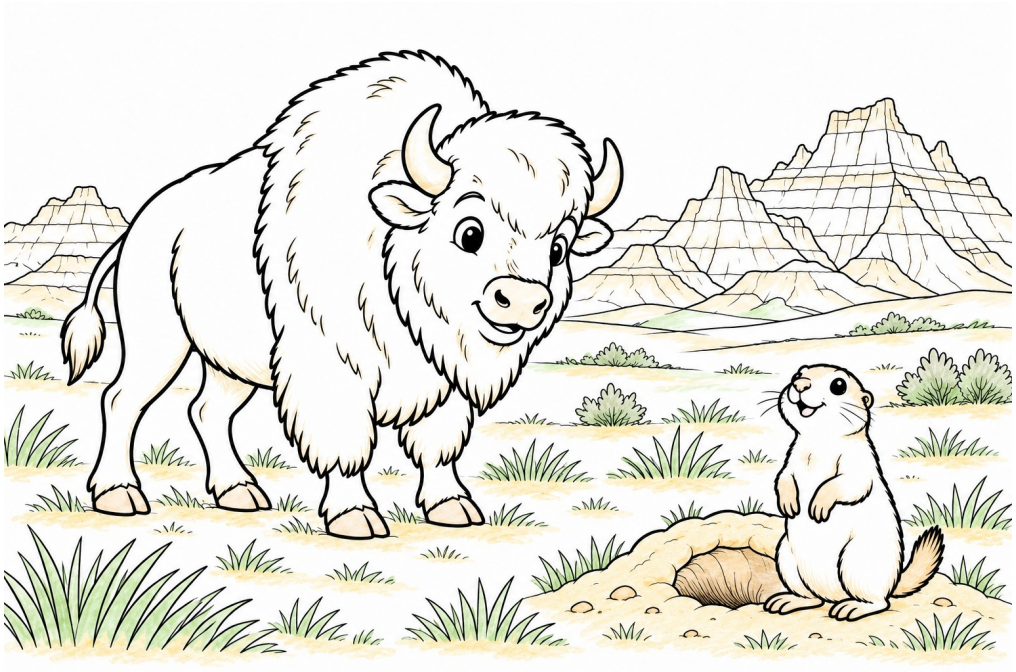
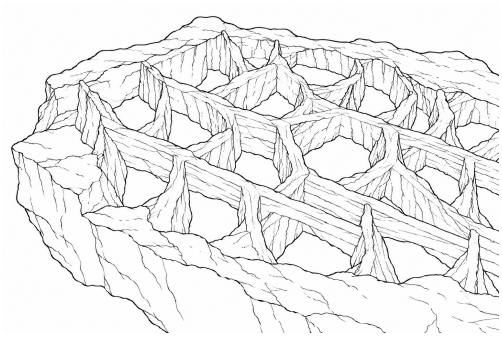
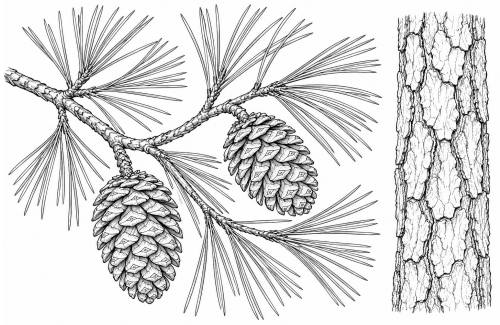
FOSSILS CAVES AND PRAIRIE **FAMILY GUIDE**

Badlands & Black Hills

A Wild Base Family activity book for ages 4-6, 7-9 and 10+







PRINT BY AGE | PAGE RANGES

Ages 4-6: activities 3-14; answers 39-41.
Ages 7-9: activities 15-26; answers 42-44.
Ages 10+: activities 27-38; answers 45-47.
Shared parent guidance and sources: 48-50.

This book belongs to

Choose your discoveries

Choose a comfortable challenge level. Each packet has its own introduction and answers. Reading aloud, talking and pointing count as exploring.

AGES 4-6 | ACTIVITIES 3-14 | ANSWERS 39-41

Picture clues, a broad-path maze, sorting, patterns, counting, coloring and conversation. A grown-up can read the short directions.

AGES 7-9 | ACTIVITIES 15-26 | ANSWERS 42-44

Processes, food webs, landscape math, a word search, a crossword, history and a family strategy game.

AGES 10+ | ACTIVITIES 27-38 | ANSWERS 45-47

Illustrated mysteries, a demanding maze, a challenging crossword, a changing model, an independent code and Sudoku.

PRINT AND PACK

Print US Letter at actual size, or fit to A4. Grayscale works. Bring a pencil, crayons and a clipboard. Single-sided pages are easy to share.

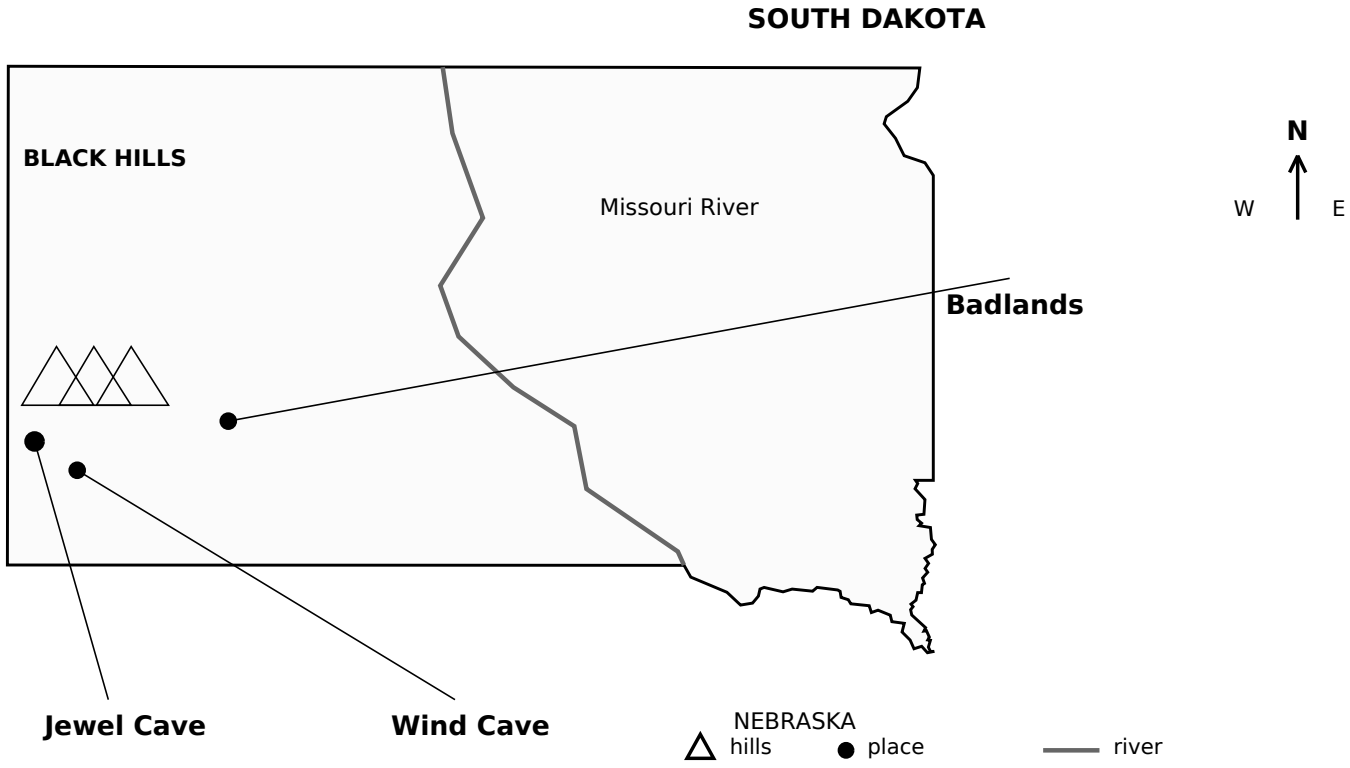
Shared parent guidance and sources: pages 48-50. Answer references use the page numbers in the PDF you are reading.

Passenger play only; keep the driver free to concentrate.

START YOUR EXPLORER PACKET **AGES 4-6**

Prairie above caves below

Point to the two caves. Put a star beside Badlands.



THREE PLACES TO EXPLORE

Badlands has fossils. Wind Cave has crossing mineral fins. Jewel Cave has pointed and flat-ended crystals.

ABOVE AND BELOW

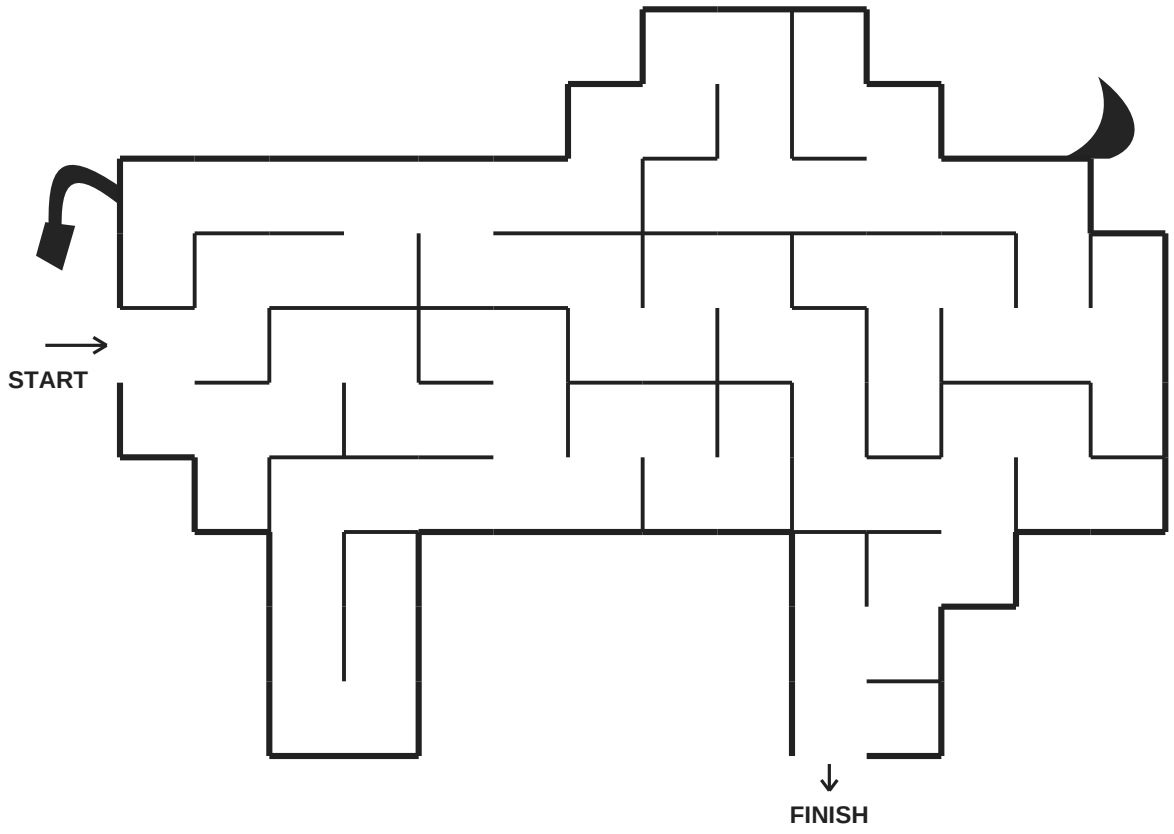
Prairie is grassland. These caves are underground. Tell someone what you would look for above the ground.

Grown-up: read the cave names. Which cave dot is farthest south?
Use a pencil and crayons. Answers begin on page 39.

SHAPED MAZE | GENTLE **AGES 4-6**

Across a bison

Follow the path from START to FINISH inside the bison.



A PRAIRIE PLANT EATER

Bison graze on prairie plants. A grassy place can feed a very big animal and many little animals too.

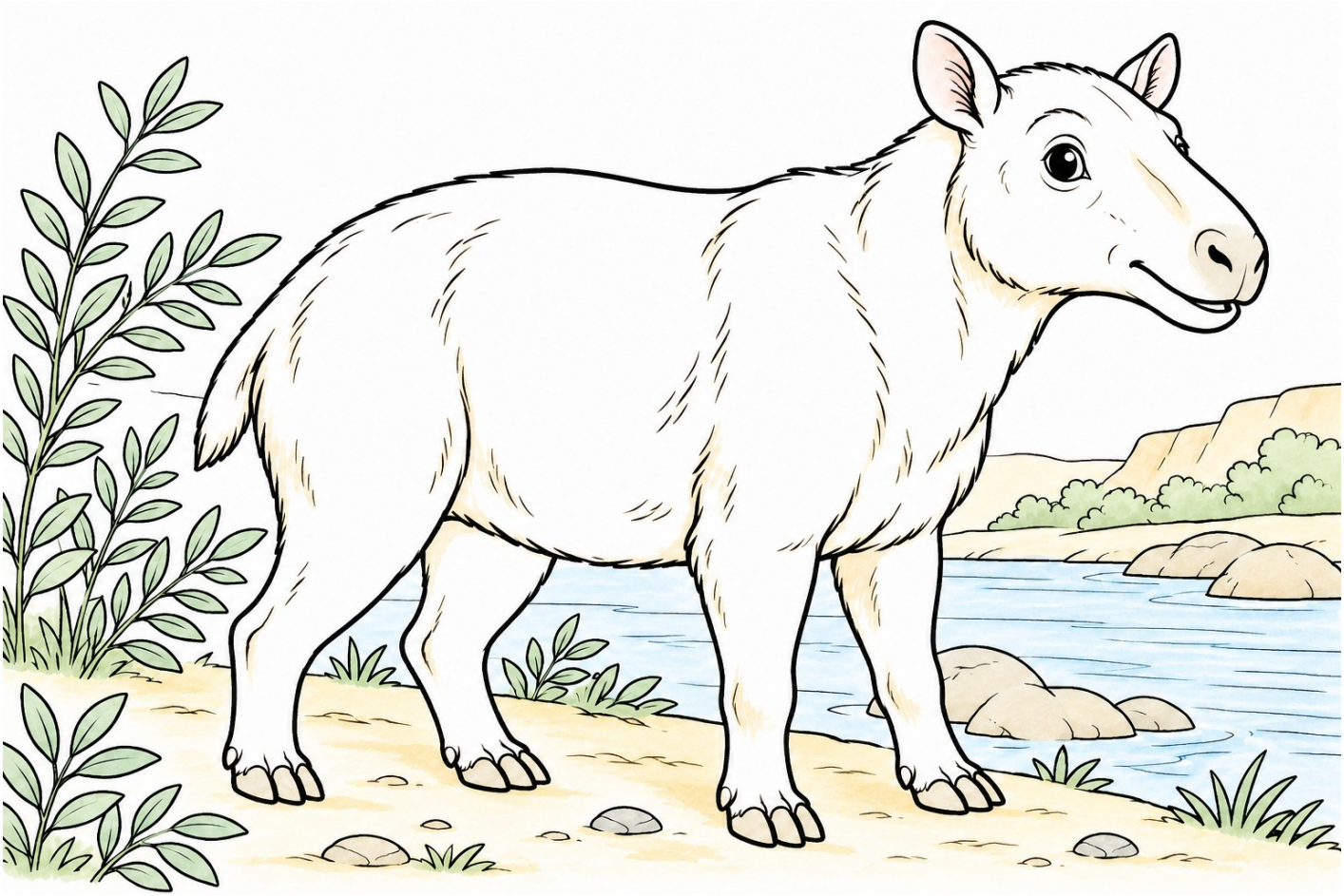
NOTICE AND CONNECT

Point to the bison’s legs and head. Draw one grass clump beside the maze.

COLOR AND DISCOVER **AGES 4-6**

A tooth tells a story

Color the oreodont. Find its mouth and hooves. Add three leafy plants beside it.



LOOK CLOSELY

An oreodont was an ancient mammal. Its broad, low teeth ground plant food. A tooth gives us a clue about what an animal ate.

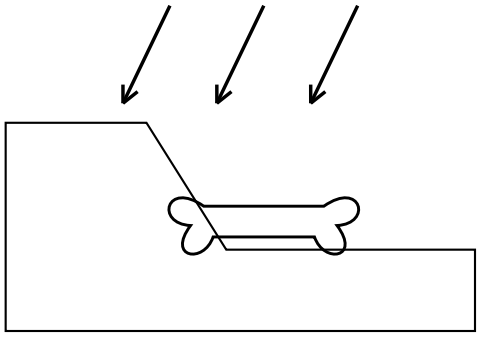
Point to the body part that ground food. Tell someone how teeth help you eat.

PUT A STORY IN ORDER **AGES 4-6**

A fossil comes into view

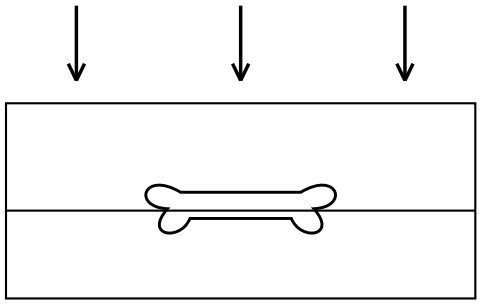
Point to what happens first. Then write 1, 2, 3 and 4 in the circles.

A



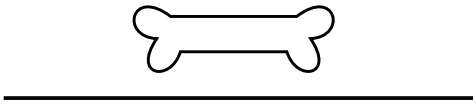
Water uncovers the fossil.

B



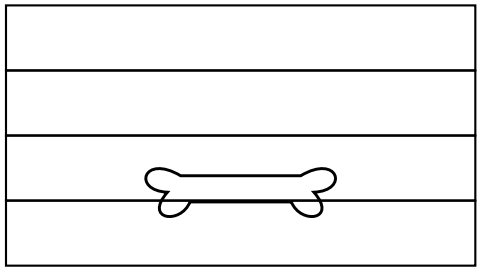
Mud covers the remains.

C



An animal leaves remains.

D



More layers build up.

DISCOVERY

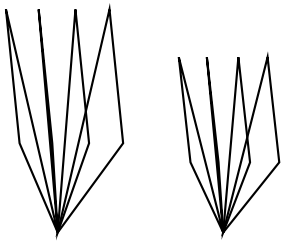
Burial can preserve a clue. Erosion can uncover it much later.

MATCH AND DRAW **AGES 4-6**

Look above and below

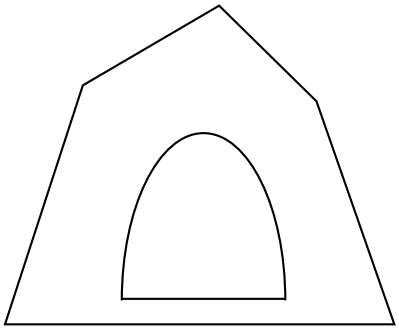
Point to: a grassy place; an underground room; moving water; an old bone in rock.

PRAIRIE



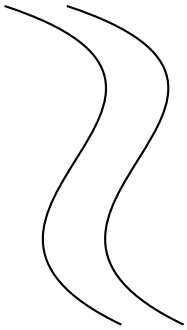
Grasses cover the ground.

CAVE



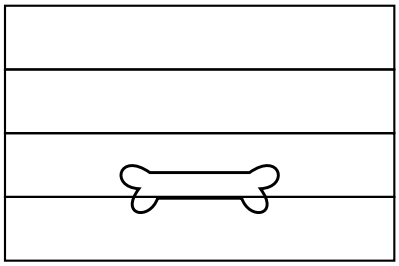
An open space underground.

STREAM



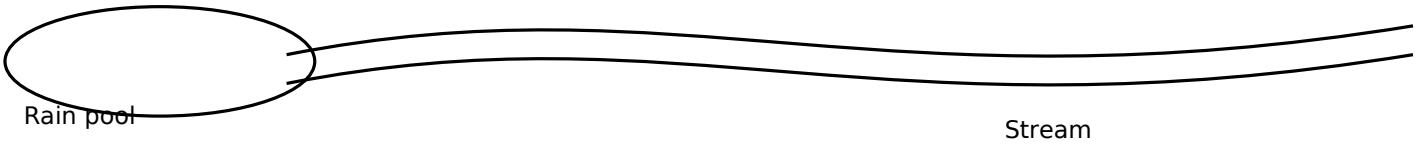
Water moves along a channel.

FOSSIL



A clue to ancient life.

Rainwater can gather and run into a stream.



Add an arrow from the rain pool along the stream.

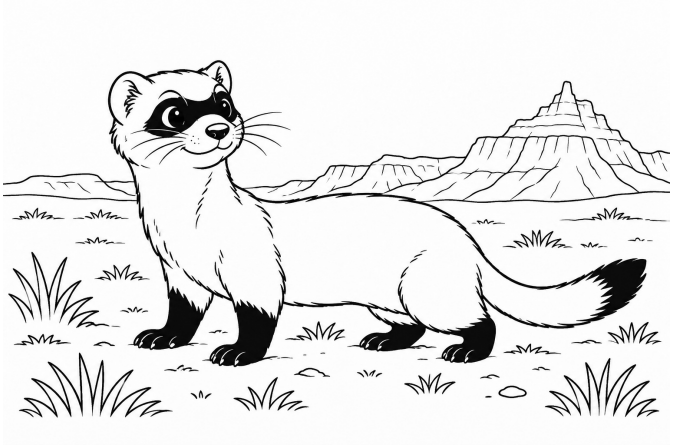
WILDLIFE SORTING **AGES 4-6**

What is for lunch

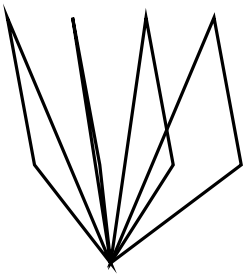
Draw a line from each food picture to the animal that eats it. Prairie dogs eat grasses and leaves. Ferrets mainly eat prairie dogs.



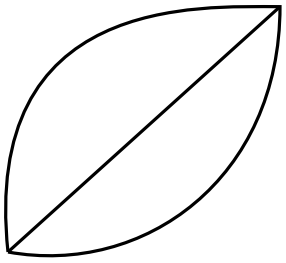
PRAIRIE DOG



FERRET



GRASS



LEAVES



PRAIRIE DOG

COUNT AND CIRCLE

How many food pictures? ____

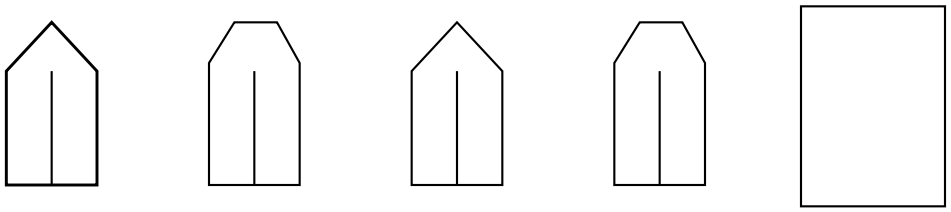
Circle the foods that come from plants.

JEWEL CAVE SHAPE PLAY **AGES 4-6**

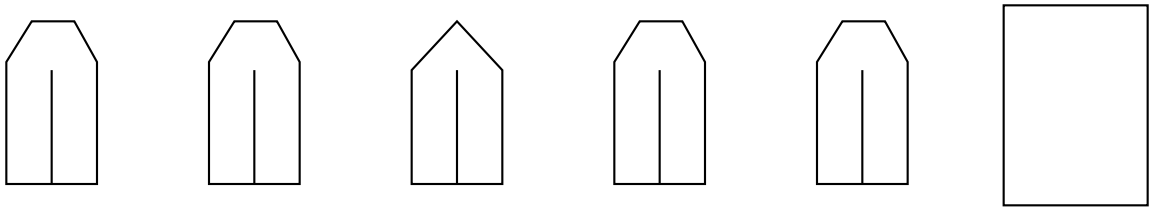
A crystal pattern studio

Draw the next crystal in each empty box. Then draw and count your own crystals.

1.



2.



JEWEL CAVE SHAPES

Pointed: dogtooth spar. Flatter-ended: nailhead spar. Both are crystals of calcite.

DRAW TWO PAIRS OF POINTED CRYSTALS

Two pairs have how many crystals? ____

PEOPLE AND HISTORY **AGES 4-6**

A place with a long story

Wind Cave is sacred to Lakota people. Families and communities have different stories and continuing connections to this place.

LONG AGO

People knew this land long before it was called a national park.

IN 1903

Wind Cave became a national park. Park workers help care for the cave and prairie.

TODAY

Lakota communities continue their connections. Visitors can listen carefully and respect important places.

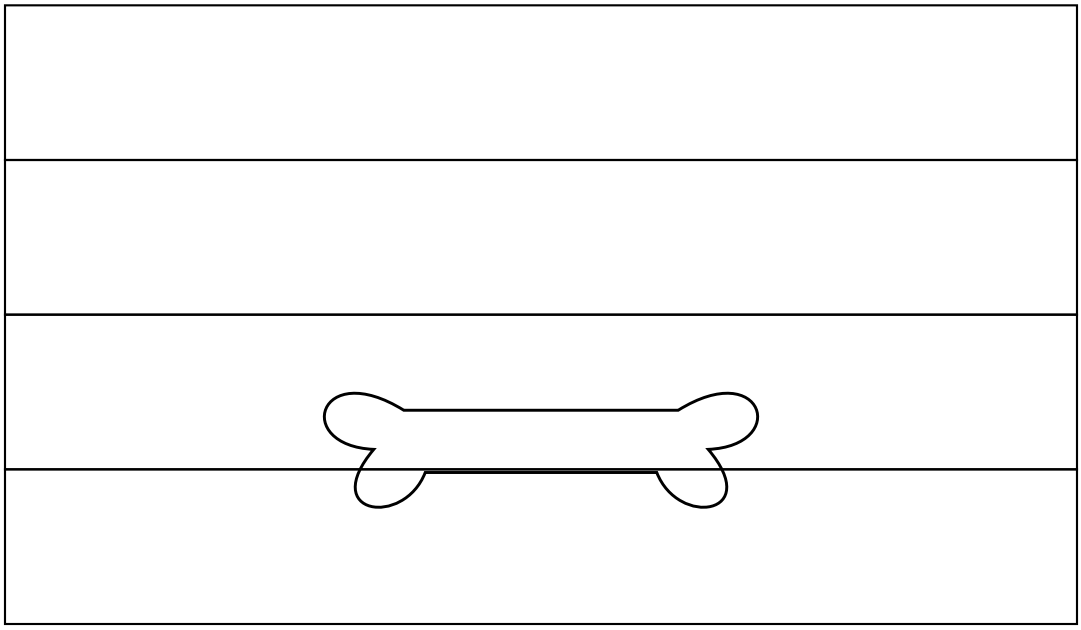
Point to the earliest part. Circle TODAY. How can your family show care for a place?

DRAW YOUR CARE-FOR-A-PLACE IDEA

COUNT AND BUILD **AGES 4-6**

Build a fossil notebook

Color the rock layers. Your notebook holds sketches while real fossils stay in place.



A FOSSIL CLUE

Layers can bury remains. Water can wear rock away and uncover them. Leave real fossils where they are found.

Draw 3 fossil sketches, then 2 more. How many? ____

3 + 2

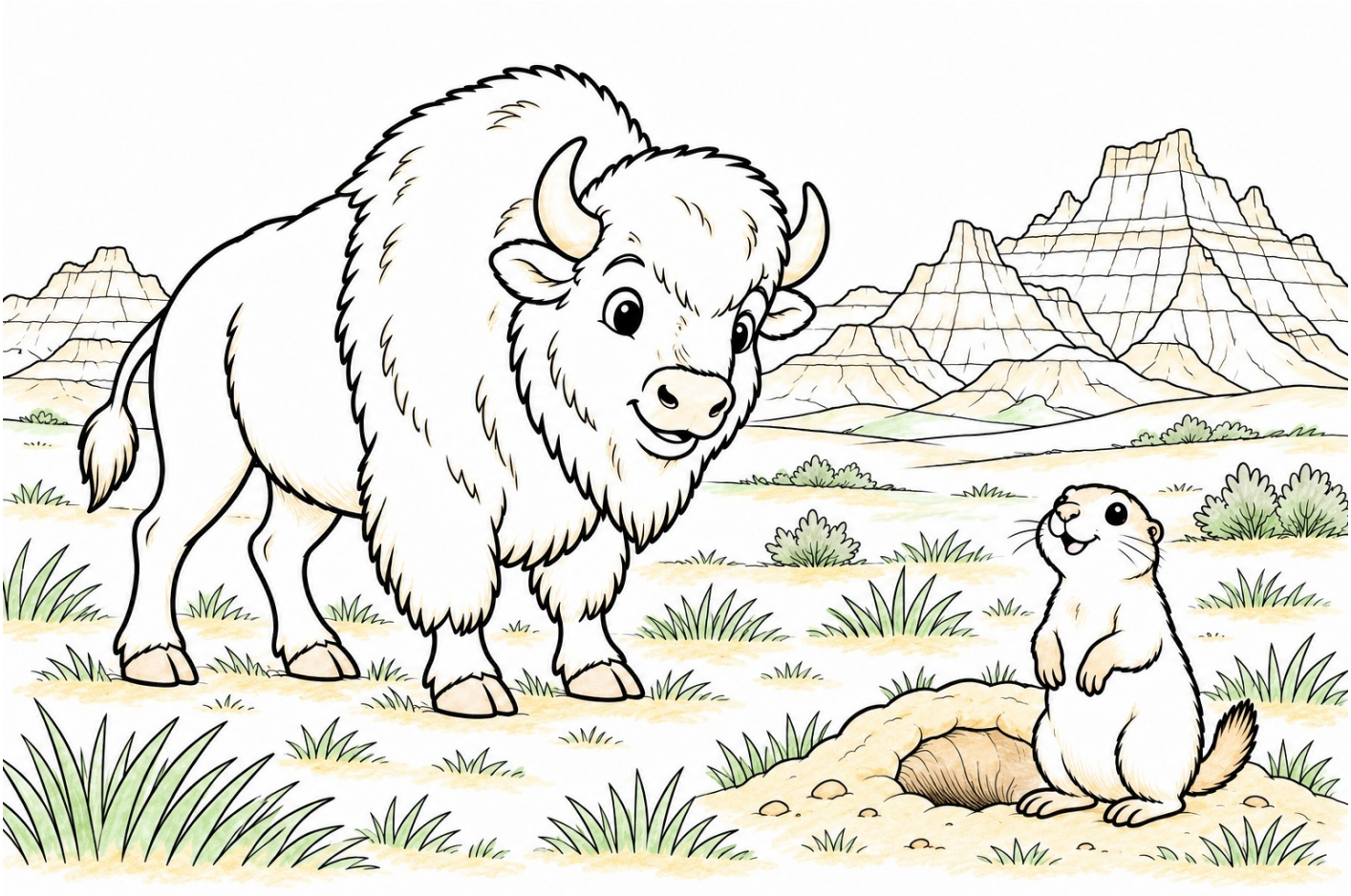
4 + 2 = ____ 7 - 2 = ____

COLOR AND LOOK CLOSELY

AGES 4-6

Prairie neighbors

Color the prairie scene. Find the large shoulder hump and the small burrow opening. Add three grasses of different heights.



MANY HEIGHTS OF GRASS

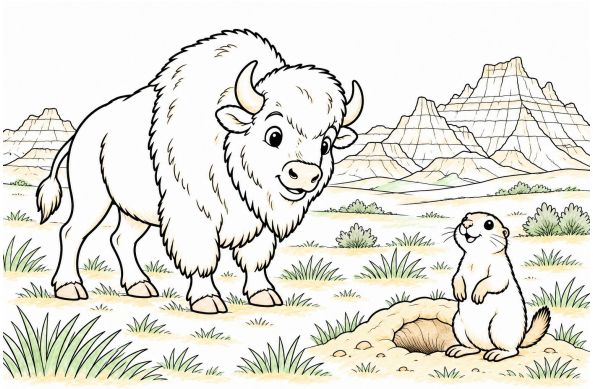
The Badlands mixed-grass prairie has short and taller grasses. Plants feed animals, and burrows provide homes below ground.

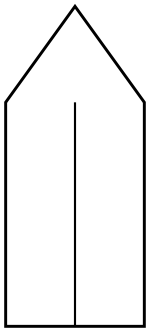
Point to something above ground and something below ground. How are they connected?

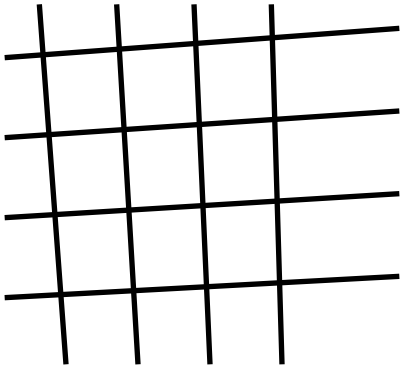
FAMILY ROAD BREAK **AGES 4-6**

I spy a prairie shape

Take turns: give a shape clue and let someone guess the picture.







Try: “I spy a tall hump” or “I spy crossing lines.”

DRAW YOUR OWN SHAPE CLUE

CHANGE THE GAME

Now give a food or home clue. Help one another guess.

REMEMBER AND SHARE AGES 4-6

My prairie and cave memories

Choose something from this book or your visit. Draw, tell, or ask a grown-up to write your words.

A SHAPE I WILL REMEMBER

AN ANIMAL AND SOMETHING IT NEEDS

My new word is

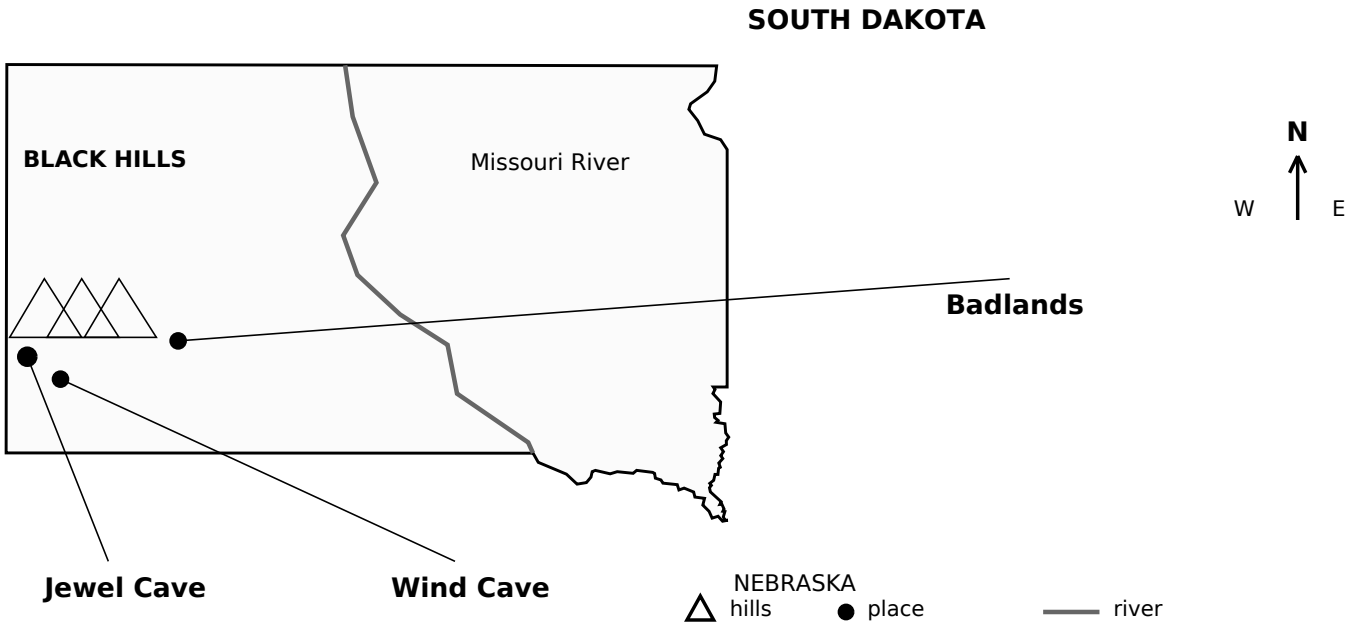
One thing I can explain is

Share your favorite page with someone.

START YOUR EXPLORER PACKET **AGES 7-9**

Read the prairie and hills

Badlands National Park, Wind Cave National Park and Jewel Cave National Monument are in southwestern South Dakota. Each preserves different clues about this region.



THREE KINDS OF CLUES

Badlands: fossils of ancient mammals and layered rocks.
Wind Cave: crossing calcite fins called boxwork, with prairie above.
Jewel Cave: calcite crystals with pointed or flatter ends.

1. Which place is farthest west? _____

2. Which cave is farthest south? _____

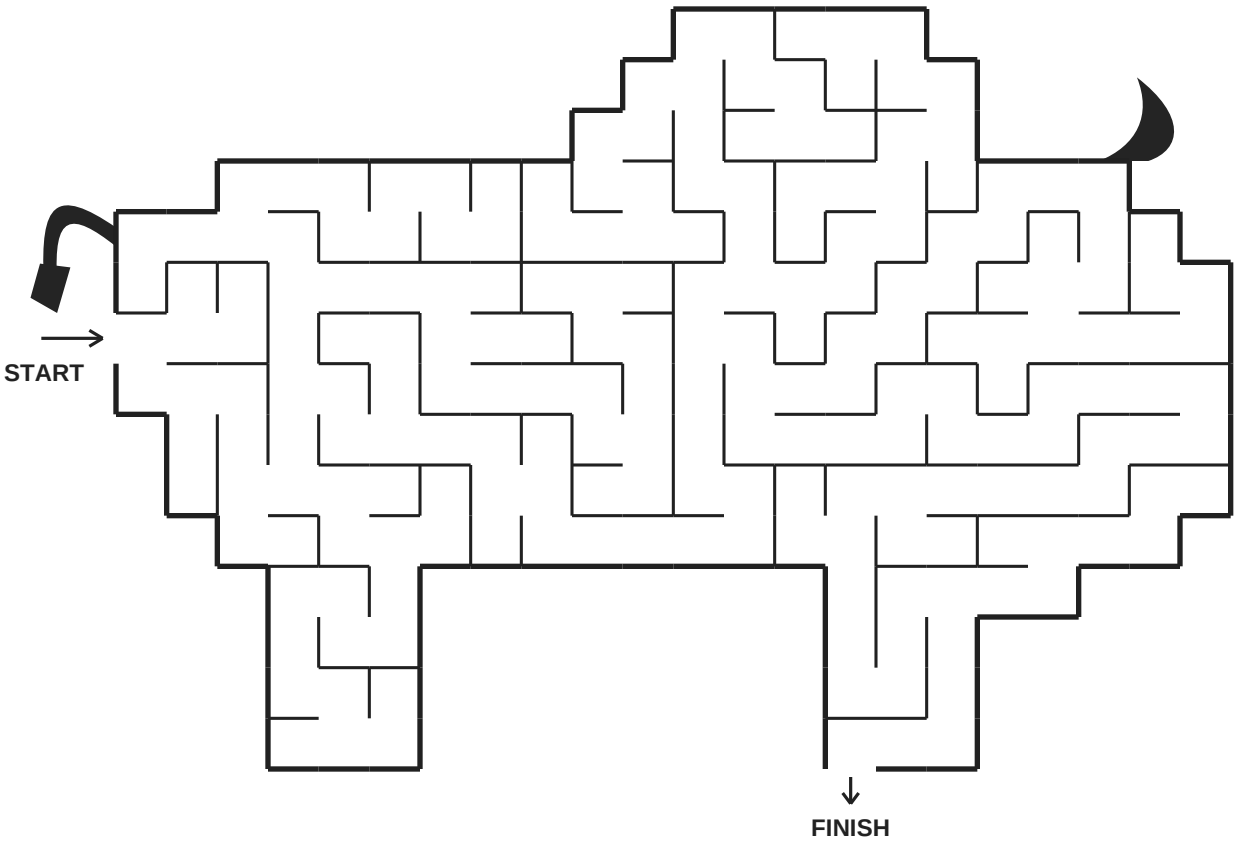
3. Badlands lies east or west of both caves? _____

Pack a pencil and crayons. A fossil is preserved evidence of ancient life; a crystal is a mineral shape with flat faces. Answers begin on page 42.

SHAPED MAZE | MODERATE **AGES 7-9**

The bison route challenge

Find the route through the bison. At a fork, look ahead before choosing. If a path ends, backtrack to the last choice.



GRAZERS SHAPE THE PRAIRIE

A grazer eats grasses and other low plants. Bison grazing and prairie dog digging can change the plants growing around them.

NOTICE AND CONNECT

Why might a patch of short grass look different from an ungrazed patch? Give one idea.

SEQUENCE AND EXPLAIN **AGES 7-9**

How a fossil is revealed

Remains may be buried by sediment. Over a long time, layers can harden into rock. Later, erosion can remove the rock above a fossil.

A
More sediment builds up above the buried remains.

B
Erosion uncovers the fossil at the surface.

C
An animal dies and leaves remains on the ground.

D
Sediment covers the remains.

E
Layers harden; a trace of the animal is preserved.

Write the letters in order: ____ → ____ → ____ → ____ → ____

NOTICE AND CONNECT
Why can a fossil newly exposed today still be ancient? Tell the story using burial and erosion.

BUILD A FOOD WEB

AGES 7-9

Who depends on prairie plants

Plants use sunlight. Bison eat grasses. Prairie dogs eat grasses and seeds. Ferrets mainly eat prairie dogs. Prairie dog burrows also shelter ferrets.

BUILD THE CONNECTIONS

Draw five energy or food arrows: sunlight to grasses, then four food-to-eater links. Add two dashed shelter lines from BURROW to the animals that use it.

SUN

GRASSES

BISON

SEEDS

PRAIRIE DOG

FERRET

BURROW

NOTICE AND CONNECT

Which animal could lose both a main food and a shelter if prairie dogs disappear?

COMPARE AND CALCULATE AGES 7-9

Layers crystals and field math

Use the field-sketch quantities below. At Badlands, erosion removes rock; in Jewel Cave, minerals can build crystals.

1 LAYER COMPARISON

A paper rock stack has layers 3, 6, 4 and 7 cm thick. What is the total? ____ cm
How much thicker is the 7 cm layer than the 3 cm layer? ____ cm

2 A NOTEBOOK STOP

You spend 18 minutes observing and 12 minutes sketching. How many minutes altogether? ____

3 TIME TO EXPLORE

You have 90 minutes for the activity. After the first 30 minutes, how much time remains? ____

TWO WAYS THE LANDSCAPE CHANGES

Erosion carries loosened rock and soil away. Crystals grow when minerals leave water and become solid.

NOTICE AND CONNECT

Which process removes material? Which adds it?

WORD SEARCH AND SORT **AGES 7-9**

Words above and below

Find seven words running right, down or diagonally down-right. Sort them into three discovery groups.

S	O	C	H	J	D	D	E	H	E	Z
E	B	H	X	F	Z	H	D	Y	E	B
C	O	T	C	P	O	M	W	G	Y	I
C	X	L	G	A	A	S	Q	Y	Q	F
R	W	K	D	Z	L	U	S	H	Z	E
Y	O	I	C	J	H	C	W	I	Z	R
S	R	H	W	X	R	O	I	D	L	R
T	K	L	H	T	O	J	V	T	T	E
A	R	C	G	M	Q	M	V	B	E	T
L	P	S	P	R	A	I	R	I	E	Q
T	E	S	V	X	B	U	R	R	O	W

CALCITE CRYSTAL BOXWORK FOSSIL
PRAIRIE BURROW FERRET

Mineral shapes: _____

Ancient-life clue: _____

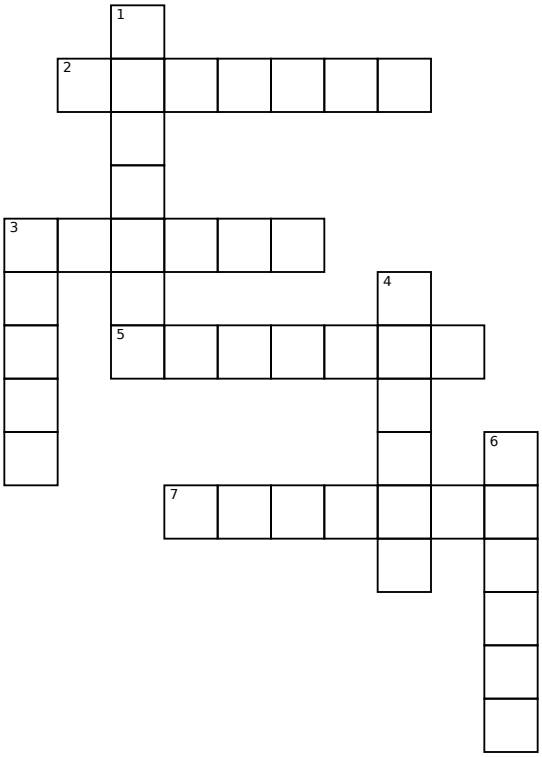
Prairie life and places: _____

NOTICE AND CONNECT
Choose a word from two different groups. Make a sentence that connects them.

CROSSWORD | MODERATE **AGES 7-9**

Prairie words fit together

Use the clues and discoveries from this packet. Write one letter in each square.



ACROSS

2. Mineral form with flat faces. (7)
3. An animal tunnel home. (6)
5. Movement of loosened rock or soil. (7)
7. Mineral in boxwork and spar crystals. (7)

DOWN

1. A grassland. (7)
3. Large grazer with a shoulder hump. (5)
4. Preserved clue to ancient life. (6)
6. Masked prairie animal that eats prairie dogs. (6)

Try a crossing before looking at the answers.

DEDUCTION | LAYER ORDER **AGES 7-9**

The scrambled rock stack

Four labeled paper layers A, B, C and D were mixed up. Rebuild their original order from top to bottom. Use each label once.

CLUES

1. C was below A but above D.
2. B was above A.
3. D was the oldest layer.
4. These layers were undisturbed: oldest at the bottom.

Position	Layer	Clue that helped
Top / youngest		
Second		
Third		
Bottom / oldest		

NOTICE AND CONNECT

If the top two layers erode away, which letter becomes exposed? Explain how you know.

TIMELINE AND PERSPECTIVE **AGES 7-9**

Three dates a longer story

Lakota and other Indigenous peoples have long connections to this region. Park dates mark one part of a much longer history.

1978
Badlands is redesignated from a national monument to a national park.

1903
Wind Cave becomes a national park.

1908
Jewel Cave becomes a national monument.

1. Write the dates from earliest to latest.

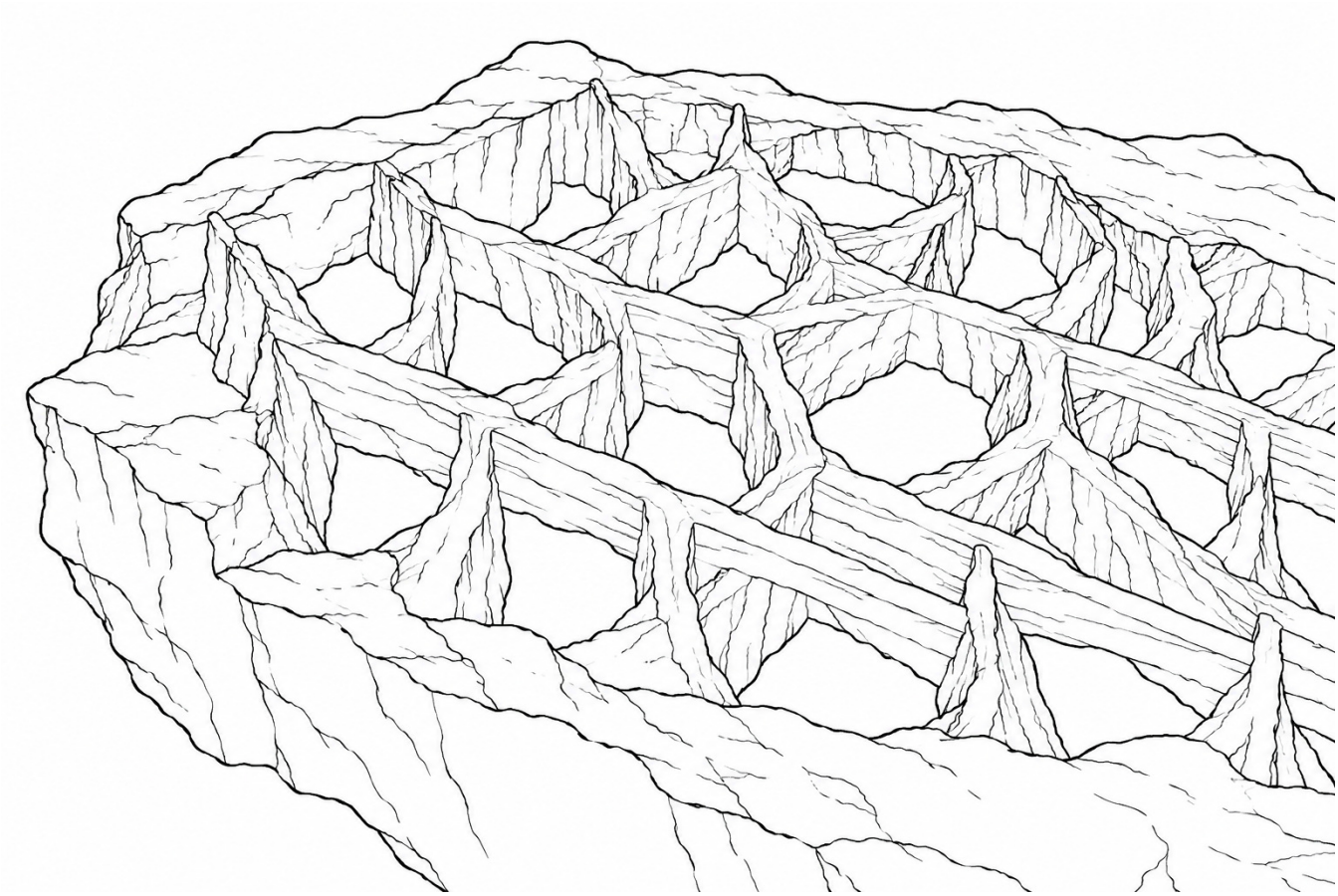
2. How many years passed from Wind Cave’s park designation to Jewel Cave’s monument designation? Show your subtraction.

THINK BEYOND THE DATES
Why would a timeline beginning in 1903 leave out important parts of this region’s story?

COLOR AND OBSERVE **AGES 7-9**

Look for two kinds of lines

Study the Wind Cave boxwork drawing. Find crossing blades, irregular spaces and edges that project outward. Shade adjacent spaces differently using pencil pressure.



COMPARE WITH JEWEL CAVE

Boxwork is a network of thin fins. Jewel Cave’s namesake crystals have tips and flat faces. Sketch one of each below.

BOXWORK

CRYSTAL

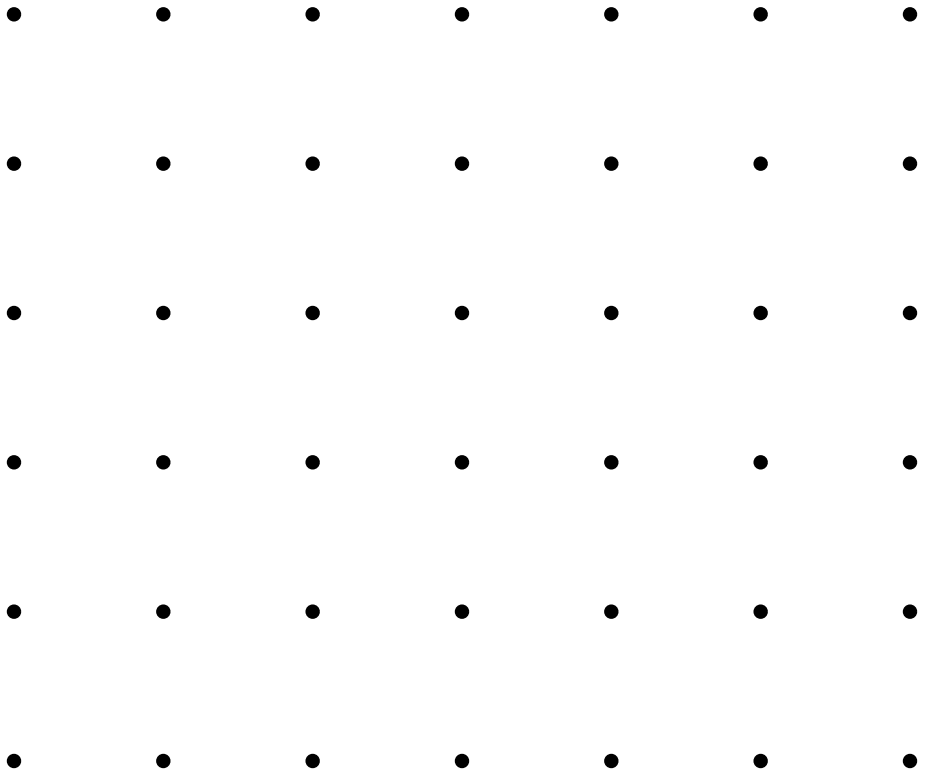
FAMILY ROAD BREAK AGES 7-9

Dots and boxes

Two players take turns drawing one straight line between neighboring dots, across or down. Never draw a line that is already there.

HOW TO SCORE

Close the fourth side of a box? Put your initial in it and take another turn. Most boxes wins; equal scores are a tie.



Player initials _____ and _____

Final score _____ to _____ Winner or tie _____

Count the possible boxes before you start. Do not count the dots.

REMEMBER AND SHARE **AGES 7-9**

My evidence and memories

Choose a discovery you can explain using a clue. It may come from your visit or from a page in this packet.

My discovery

The clue that helped me understand it

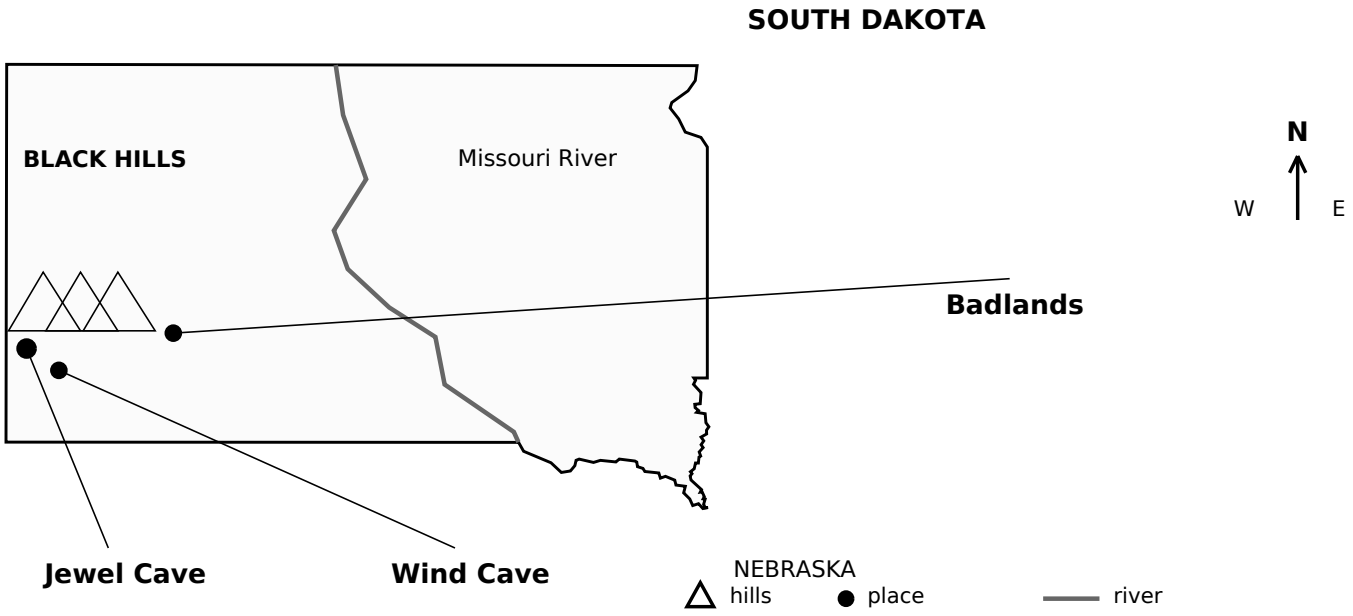
A DETAIL WORTH REMEMBERING

A question I would ask a ranger or knowledgeable storyteller

START YOUR EXPLORER PACKET **AGES 10+**

Three places many clues

In southwestern South Dakota, Badlands preserves fossils and prairie, while the Black Hills hold Wind Cave and Jewel Cave. Compare what different kinds of evidence can reveal.



THREE PLACES TO EXPLORE

Badlands: fossils, rock layers and prairie.
Wind Cave: crossing calcite fins called boxwork.
Jewel Cave: calcite crystals with pointed or flatter ends.

1. Name the westernmost and southernmost places.

_____

2. Traveling from Badlands to Jewel Cave moves mainly east or west? _____

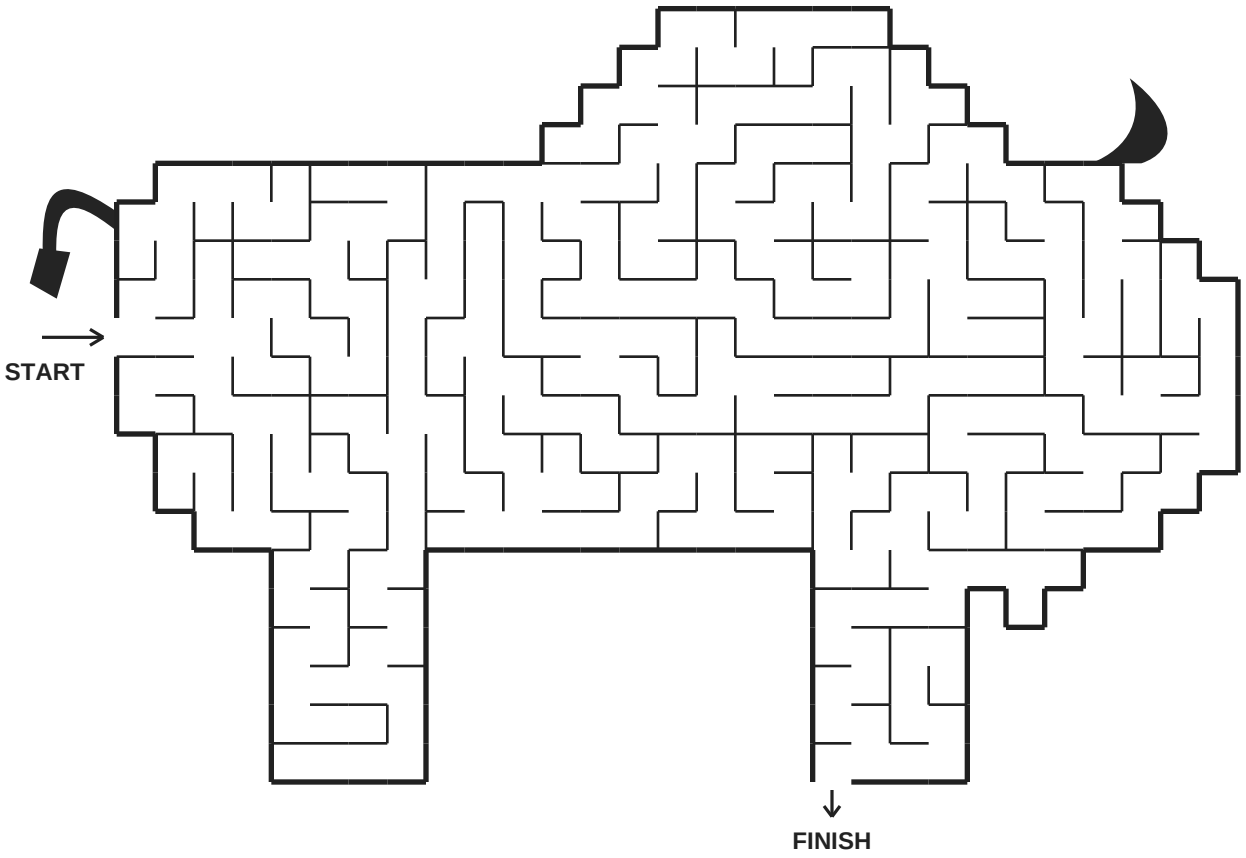
3. Choose one place above to investigate in this packet.

Pencil, crayons and a clipboard are enough. Answers begin on page 45.

SHAPED MAZE | CHALLENGING **AGES 10+**

The bison backtrack challenge

Trace START to FINISH through the full bison silhouette. Small side routes can look promising. Mark a dead end lightly, then return to your last useful fork.



A LANDSCAPE ENGINEER

Bison grazing and wallowing help shape prairie plant communities. A wallow is a shallow hollow made by rolling on the ground; water can collect there.

NOTICE AND CONNECT

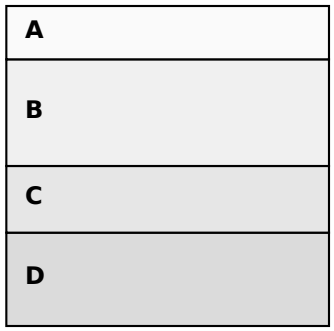
Optional: Explain how one animal’s behavior could change a tiny patch of habitat.

ILLUSTRATED SCIENCE MYSTERY **AGES 10+**

Catch the erosion mix-up

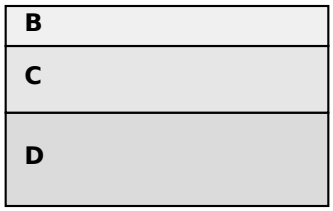
Match three labels to the scenes. Cross out the false card. The original stack has A 4 cm, B 8 cm, C 5 cm and D 7 cm, top to bottom.

1



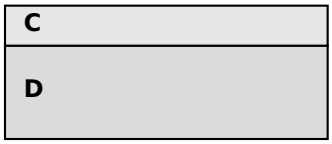
Original

2



9 cm removed

3



14 cm removed

A | SCENE ____
The original stack is 24 cm thick.

B | SCENE ____
After 14 cm is removed, 3 cm of layer C remains on top.

C | SCENE ____
The oldest layer must always be the exposed surface.

D | SCENE ____
After 9 cm is removed, 3 cm of layer B remains on top.

ANOTHER EROSION CLUE
Removing upper layers can expose older rock. Exposure is not the same event as deposition.

BUILD AND QUESTION A FOOD WEB AGES 10+

Energy through a prairie

Bison and prairie dogs eat grasses. Prairie dogs also eat seeds. Ferrets mainly eat prairie dogs and use their burrows. Food arrows point toward the eater.

A. Draw four feeding arrows. Use dashed lines for two shelter links.

GRASSES	**BISON**	**PRAIRIE DOG**
SEEDS	**FERRET**	**BURROW**

B. Trace two different ways prairie dogs support ferrets.

EVIDENCE OR OVERREACH

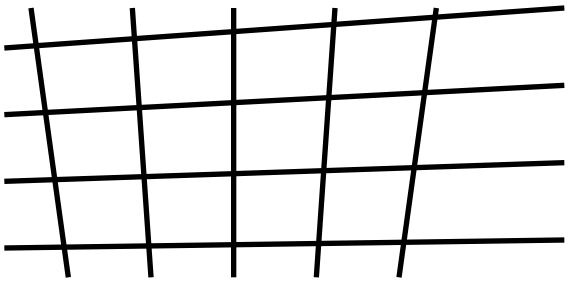
“If prairie dog numbers fall by half, ferret numbers must fall by exactly half.” Does this web prove that? Circle YES or NO. Optional: name another factor.

COMPARE THE CLUES
AGES 10+

One mineral two histories

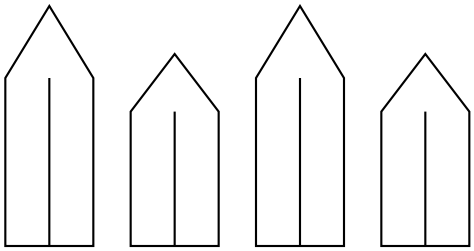
Two cave features contain calcite. Compare the pictured structures and use their formation clues, not only their mineral name.

A WIND CAVE



Thin crossing fins remain as softer surrounding rock wears away.

B JEWEL CAVE



Calcite crystals grow from mineral-bearing water.

CIRCLE A OR B

1. Which feature has crossing fins? A / B
2. Which feature grows crystals from mineral-bearing water? A / B
3. Does one mineral name prove one formation process? YES / NO

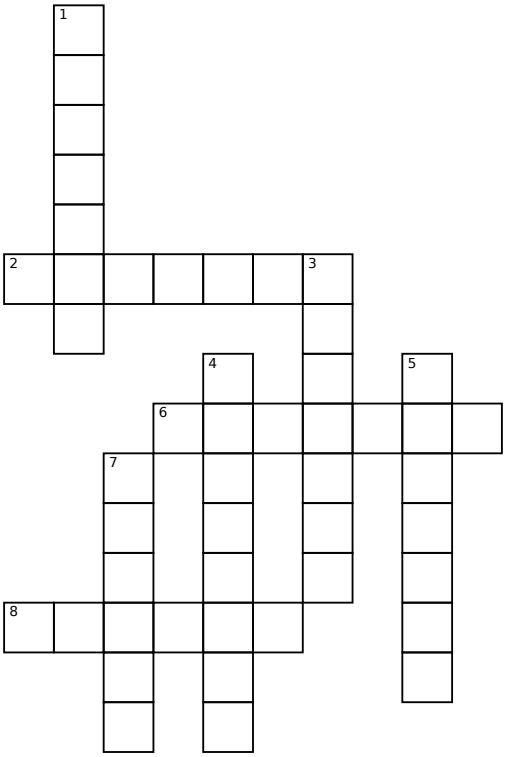
ONE MORE CAVE CLUE

Water can deposit mineral material, but weathering can also reveal resistant material already in rock. Optional: explain which scene illustrates each idea.

CROSSWORD | CHALLENGING **AGES 10+**

Words that unlock the land

Use the clues and discoveries in this packet. Try the crossings before using the optional hints with the answers.



ACROSS

2. Grassland home for grazers. (7)

6. Mineral shape with flat faces and an orderly structure. (7)

8. Tunnel shelter made by a digging animal. (6)

DOWN

1. Thin intersecting cave fins. (7)

3. Movement of loosened rock and soil. (7)

4. Extinct mammal whose grinding teeth suggest a plant diet. (8)

5. Mineral shared by cave crystals and boxwork. (7)

7. Black-footed predator that uses prairie dog homes. (6)

Try a crossing before looking at the answers.

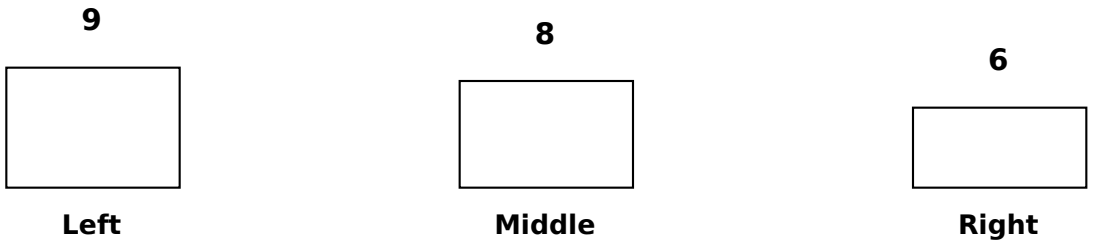
EROSION MODEL | MULTI-STEP REASONING **AGES 10+**

A model wears down ridges

Erosion wears landscapes down unevenly. Use a changing paper model to track three ridge heights one round at a time.

MODEL RULES

Each round, remove 2 height units from the tallest ridge. Other ridges stay unchanged. For equal heights choose Left before Middle before Right.



Record the ridge used and all three heights after each round.

Round	Ridge used	Left	Middle	Right
Start	-	9	8	6
1				
2				
3				
4				
5				
6				

B. How many times was each ridge lowered? Left ___ Middle ___ Right ___

C. Which ridges are lowered in the next two rounds? _____

Optional: why does the first tallest ridge not stay the tallest?

GEOGRAPHY AND A CODE AGES 10+

Follow routes and clues

A locator compares the positions of places. A route is an ordered sequence of stops. Use the named directions to follow the routes below.

TWO REGIONAL ROUTES

Route A: Jewel Cave → Wind Cave → Badlands
Route B: Badlands → Wind Cave → Jewel Cave
Jewel Cave lies west of Wind Cave. Badlands lies east of both caves.

1. Which route ends at the westernmost place? _____

2. Which route finishes east of both caves? _____

DECODE AN EXPLORER RULE

Each coded letter is five places AFTER its real letter. Move back five to decode it. For example, F means A and B means W. Spaces stay in place.

KTQQTB YMJ HQZJX

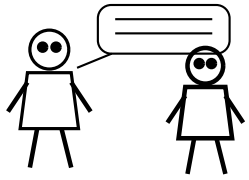
Optional: explain how the decoded rule helps with a locator.

MATCH EXHIBITS AND LABELS **AGES 10+**

The museum label mix-up

Three exhibits lost their labels. Read each clue, then match the exhibit to the best label. Different kinds of evidence preserve different stories.

A



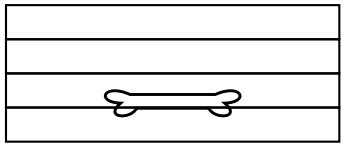
A named Oglala Lakota storyteller shares one community’s Wind Cave account.

B

1903

A document records Wind Cave’s national park designation.

C



A notebook records a fossil’s exact place while leaving it in the ground.

LABELS

1 Evidence and fossil context
2 Living community knowledge
3 A national park designation

Exhibit A → label ____ B → label ____ C → label ____

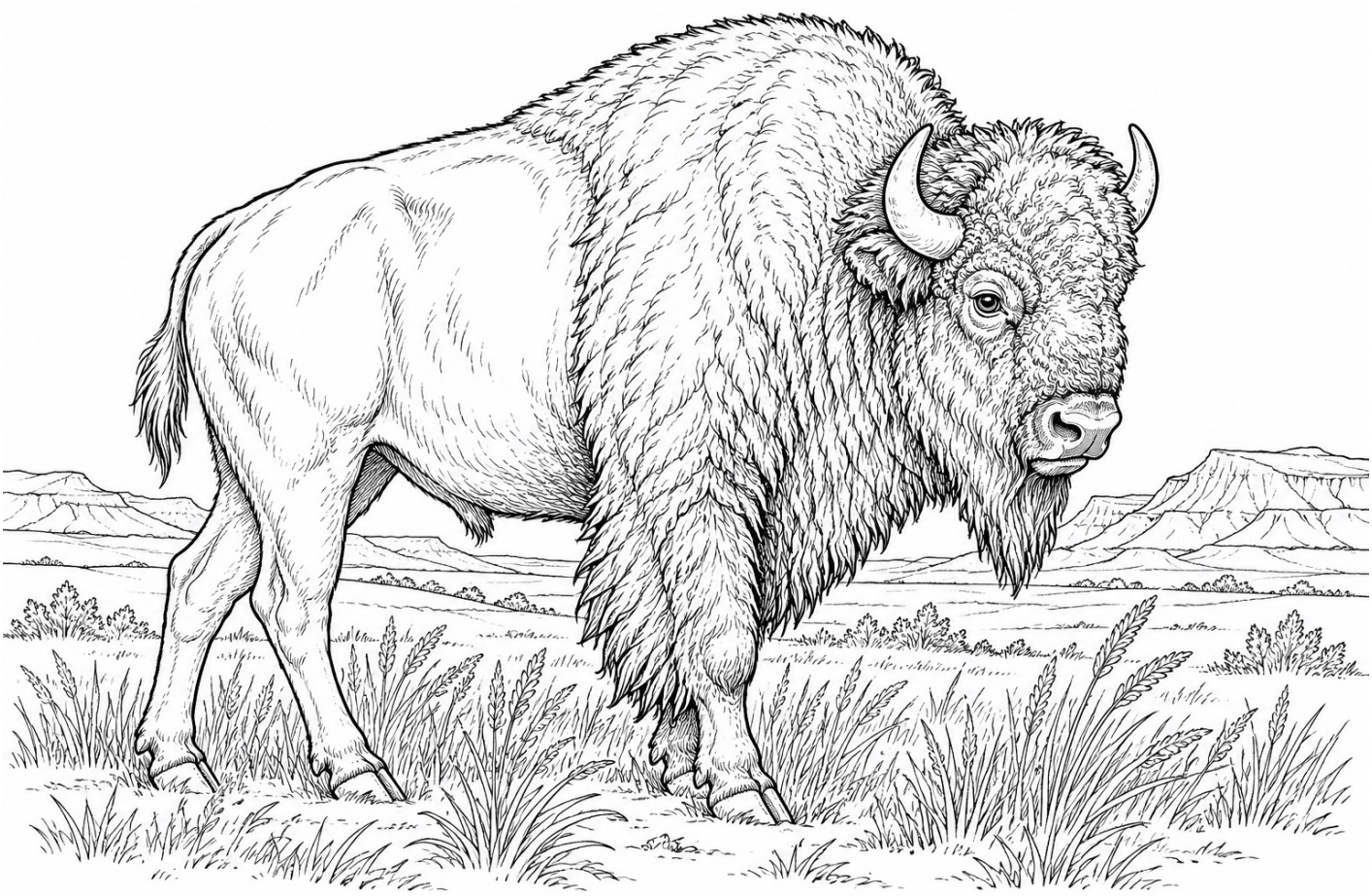
CHOOSE THE MUSEUM HEADLINE

MANY KINDS OF EVIDENCE / ALL STORIES BEGIN WITH PARKS

NATURALIST COLOR STUDY **AGES 10+**

A prairie-ready grazer

Color the bison study. Add three labels connecting a visible structure with its function, using the information below.



STRUCTURE AND FUNCTION

Shoulder and neck muscles: move the heavy head.
Thick coat: insulation against cold.
Mouth: gathers grasses and other low plants.

Optional: compare the heavy front of the body with the hindquarters. How does the shape support a grazing animal?

FAMILIAR ROAD BREAK AGES 10+

The number rest stop

Place 1-9 in each row, each column and each bold 3 × 3 box. Every number appears once in each. Work independently and use pencil.

9					6			1
5	1		4	8		7		
	6	7	5		1	4		9
		6			5		9	
	9		7		2	3		5
	5			9			2	
	4			2		1		
							4	
1			9					

A WAY IN

Find a row, column or box with only a few gaps. List the missing digits, then use the crossing row and column to eliminate choices.

Afterward: teach someone one deduction you made without guessing.

SYNTHESIZE AND REMEMBER AGES 10+

Make a discovery worth sharing

Choose a question you can now explain. Support your answer with two details from this packet, an exhibit or your own observations.

My question

My explanation and two supporting details

DRAW A MODEL OR DETAIL THAT HELPS EXPLAIN YOUR IDEA

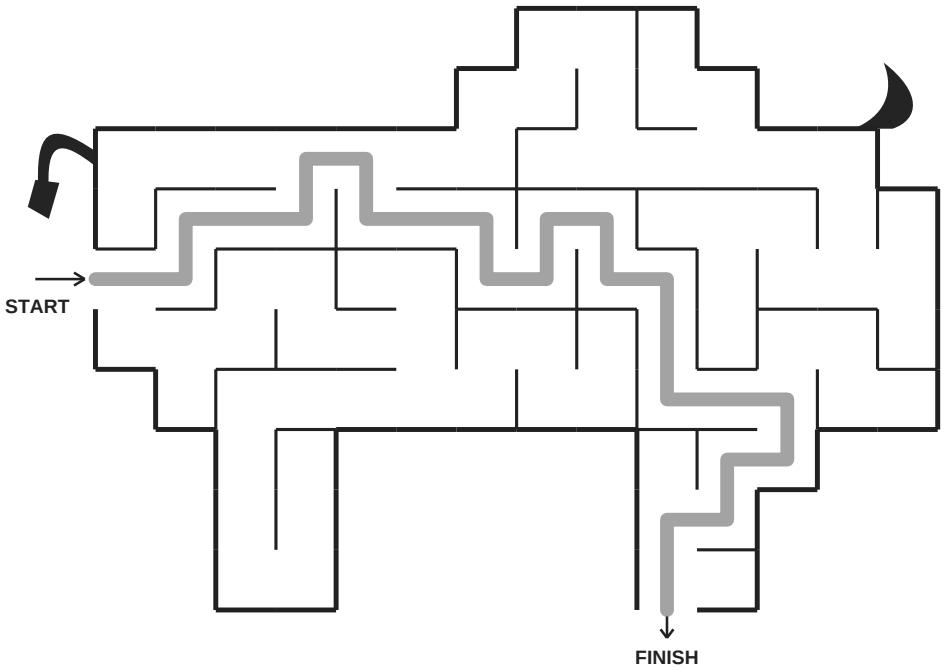
One thing I want my family to remember

ANSWER KEY | 1 OF 3 **AGES 4-6**

Routes and connected ideas

Try one hint before giving the answer. Use the printed activity page number and exact title.

Page 4 Across a bison



Page 3 Prairie above caves below

Point to Wind Cave and Jewel Cave; star Badlands. Wind Cave is the farthest south. Prairie is above ground; caves are underground.

Page 5 A tooth tells a story

Mouth/teeth grind plant food. Three plants are requested; colors and plant drawings vary. An oreodont was a mammal, not a dinosaur.

Page 6 A fossil comes into view

Order C, B, D, A. Card numbers A=4, B=2, C=1, D=3. A fossil exposed today can be much older than today.

ANSWER KEY | 2 OF 3 **AGES 4-6**

Answers to small discoveries

Invite children to point, say or draw the clue they used.

Page 7 Look above and below

Grassy place: prairie; underground room: cave; moving water: stream; old bone in rock: fossil. Draw the arrow leaving the rain pool and following the stream, not pointing into the pool.

Page 8 What is for lunch

Grass and leaves → prairie dog. Prairie dog → ferret. There are 3 food pictures. Circle grass and leaves. These foods illustrate part of the animals' diets.

Page 9 A crystal pattern studio

Pattern 1: pointed crystal. Pattern 2: pointed crystal. Two pairs contain 4 crystals.

Page 10 A place with a long story

LONG AGO is earliest. Circle TODAY. Care ideas include listening respectfully, staying on paths and leaving fossils in place. Lakota connections continue today.

ANSWER KEY | 3 OF 3 **AGES 4-6**

Answers and family conversations

Open-ended drawings and conversations can have more than one thoughtful answer.

Page 11 Build a fossil notebook

3 + 2 = 5 sketches; 4 + 2 = 6; 7 - 2 = 5. Keep real fossils in place and report their location to a ranger.

Page 12 Prairie neighbors

Find the bison’s shoulder hump and the prairie dog’s burrow opening. Add three grasses of different heights. The prairie supports food above ground and shelter below.

Page 13 I spy a prairie shape

Shape clues may point to a bison hump, crystal tip or crossing boxwork. Food and home clues vary; take turns giving a clue without naming its answer.

Page 14 My prairie and cave memories

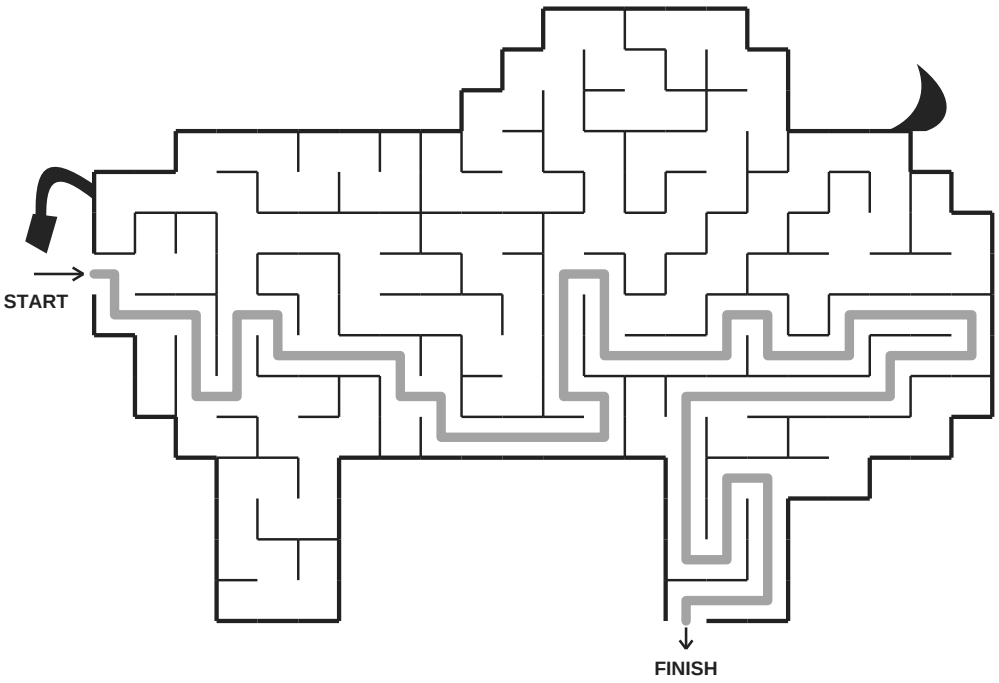
Drawings and memories vary. A useful explanation connects an animal to food or shelter, or a cave shape to a visible feature.

ANSWER KEY | 1 OF 3 **AGES 7-9**

Routes and connected ideas

Try one hint before giving the answer. Use the printed activity page number and exact title.

Page 16 The bison route challenge



Page 15 Read the prairie and hills

Jewel Cave is farthest west. Wind Cave is farthest south. Badlands is east of both caves.

Page 17 How a fossil is revealed

Order C, D, A, E, B. Remains are buried, layers build and harden, and erosion later exposes the fossil. Exposure date is not the age of the animal.

Page 18 Who depends on prairie plants

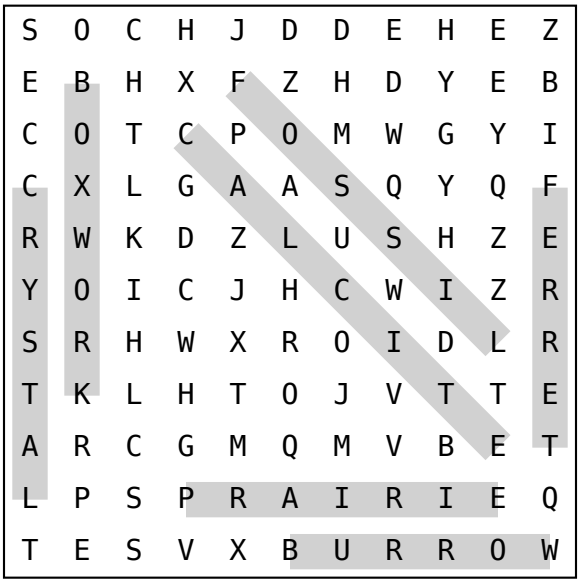
SUN → GRASSES; GRASSES → BISON; GRASSES → PRAIRIE DOG; SEEDS → PRAIRIE DOG; PRAIRIE DOG → FERRET. Dashed shelter links: BURROW to PRAIRIE DOG and FERRET. The ferret could lose both food and shelter.

ANSWER KEY | 2 OF 3 **AGES 7-9**

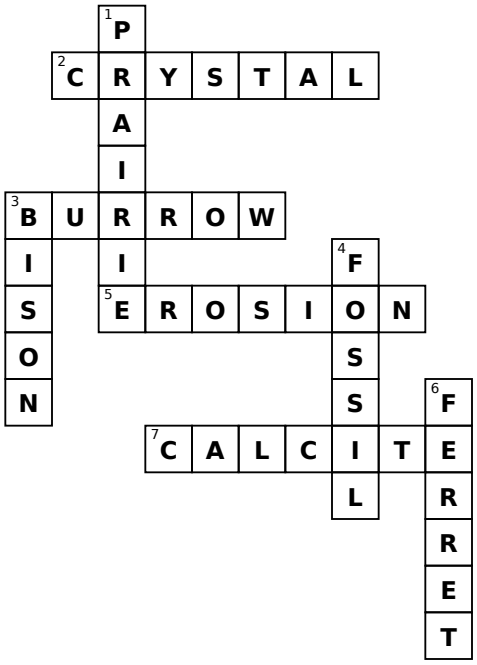
Word puzzles and evidence

Page 19 Layers crystals and field math: Total 20 cm. Difference 7 - 3 = 4 cm. Time 18 + 12 = 30 minutes; 90 - 30 = 60 minutes. Erosion removes material; crystal growth adds mineral material.

Page 20 Words above and below



Page 21 Prairie words fit together



Page 20 Words above and below

Mineral shapes: CALCITE, CRYSTAL, BOXWORK. Ancient-life clue: FOSSIL. Prairie life and places: PRAIRIE, BURROW, FERRET. The completed grid shows each unique placement.

Page 22 The scrambled rock stack

Top to bottom B, A, C, D. B is above A; C is below A and above D; D is oldest. If the top two layers erode, C is exposed.

ANSWER KEY | 3 OF 3 **AGES 7-9**

History observations and play

A reasonable explanation connects the response with evidence in the activity.

Page 23 Three dates a longer story

Order 1903, 1908, 1978. Gap 1908 - 1903 = 5 years. A timeline starting with park designation omits much earlier Indigenous history and does not describe continuing community connections.

Page 24 Look for two kinds of lines

Boxwork has thin crossing fins and irregular spaces; spar crystals have pointed or flatter ends. Colors and sketches vary, but should show that visible difference.

Page 25 Dots and boxes

5 × 6 = 30 boxes. Closing a box earns another turn. Final scores sum to 30; there is no predetermined winner.

Page 26 My evidence and memories

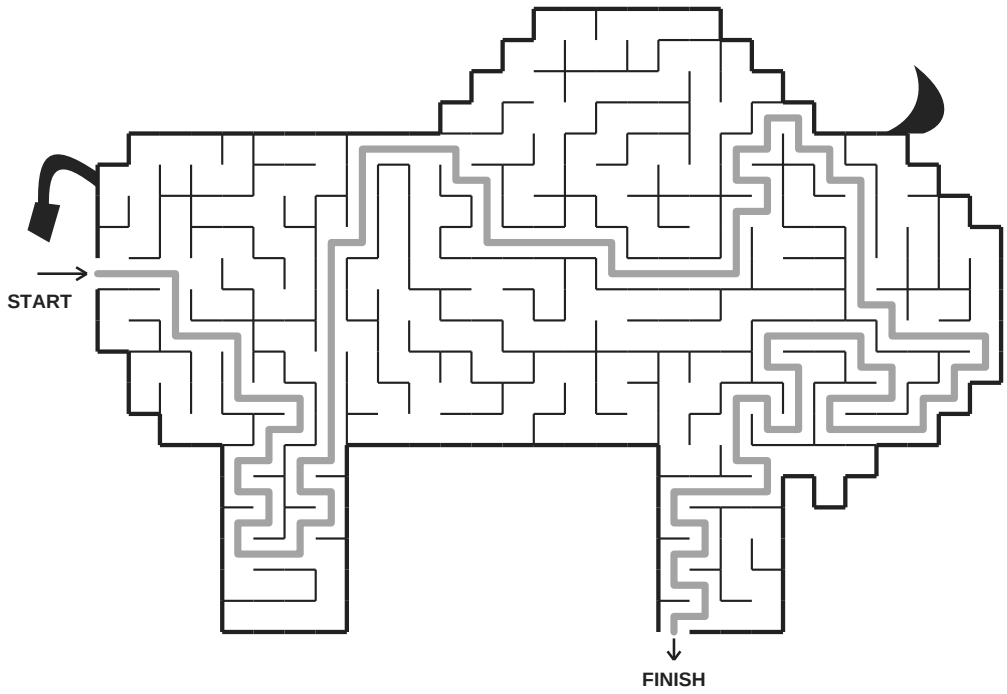
A strong memory connects a discovery to a specific clue. Examples include broad fossil teeth as a clue to plant eating or crossing fins as a clue to boxwork.

ANSWER KEY | 1 OF 3 **AGES 10+**

Routes and connected ideas

Try one hint before giving the answer. Use the printed activity page number and exact title.

Page 28 The bison backtrack challenge



Page 27 Three places many clues

Jewel Cave is westernmost; Wind Cave is southernmost. Badlands to Jewel Cave moves mainly west. Questions about crystal tips or boxwork fins can vary.

Page 29 Catch the erosion mix-up

Scene 1 → A; scene 2 → D; scene 3 → B. Cross out C. Original total is 24 cm; removing 9 cm leaves B with 3 cm, and removing 14 cm leaves C with 3 cm.

Page 30 Energy through a prairie

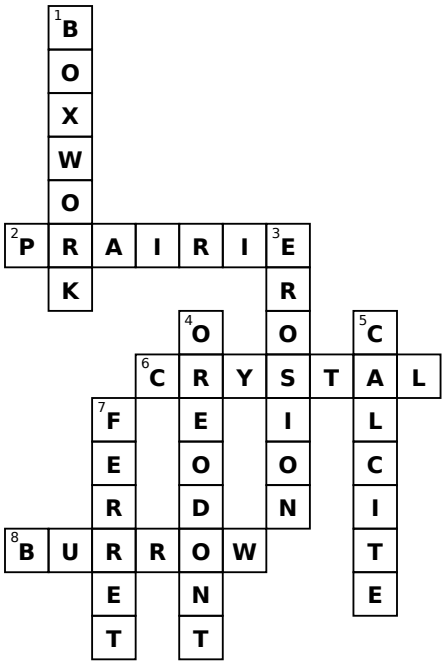
Food: GRASSES → BISON; GRASSES → PRAIRIE DOG; SEEDS → PRAIRIE DOG; PRAIRIE DOG → FERRET. Shelter: BURROW to PRAIRIE DOG and FERRET. Circle NO. Food-web links do not establish exact population changes; other food, shelter, disease or movement can matter.

ANSWER KEY | 2 OF 3 **AGES 10+**

Numbers words and models

Page 31 One mineral two histories: 1 A; 2 B; 3 NO. Wind Cave boxwork has thin crossing fins that remain after surrounding rock weathers. Jewel Cave crystals grow from mineral-bearing water. One mineral can occur in different structures and formation histories.

Page 32 Words that unlock the land



Page 33 A model wears down ridges

Rd	Used	L	M	R
1	L	7	8	6
2	M	7	6	6
3	L	5	6	6
4	M	5	4	6
5	R	5	4	4
6	L	3	4	4

Counts: L 3, M 2, R 1. Next: Middle, Right.

Page 34 Follow routes and clues

1 Route B ends at Jewel Cave, the westernmost place. 2 Route A ends at Badlands. Code: FOLLOW THE CLUES. Use the locator’s geographic clues rather than assuming that a sequence of stops is a straight line.

Page 32 Words that unlock the land | Optional hints

Completed grid shown. Optional word hints: OREODONT, CALCITE, BOXWORK, CRYSTAL, PRAIRIE, BURROW, EROSION, FERRET.

ANSWER KEY | 3 OF 3 **AGES 10+**

History art and a rest stop

Page 35 The museum label mix-up: A → 2; B → 3; C → 1. Choose MANY KINDS OF EVIDENCE. A named community account does not stand for all Lakota families. A designation date does not mark the beginning of human relationships with the place.

Page 37 The number rest stop

9	8	4	2	7	6	5	3	1
5	1	3	4	8	9	7	6	2
2	6	7	5	3	1	4	8	9
7	2	6	3	1	5	8	9	4
4	9	8	7	6	2	3	1	5
3	5	1	8	9	4	6	2	7
8	4	9	6	2	7	1	5	3
6	7	2	1	5	3	9	4	8
1	3	5	9	4	8	2	7	6

Page 36 A prairie-ready grazer

Labels may connect shoulder/neck muscles with moving the head, thick coat with insulation, and mouth with gathering plants. Naturalistic proportions show a heavier front and lighter hindquarters.

Page 38 Make a discovery worth sharing

A useful synthesis states a question and explains it with two details: for example, ferrets depend on prairie dogs for food and burrow shelter. Drawings and memories vary.

A NOTE ON THE HISTORY DISCUSSION

Invite more than one perspective. Community stories belong to living people, not only to dates or buildings. Ask which source could help answer the next question.

ADULT PLANNING NOTES FAMILY GUIDE

Before your prairie adventure

Keep the useful discovery work going with careful looking and thoughtful questions.

PLAN THE CAVES

Check official Wind Cave and Jewel Cave pages for current tour access, booking, age restrictions, accessibility, weather and closures. Follow ranger directions and keep hands off formations.

PROTECT THE EVIDENCE

Leave fossils, rocks and plants in place. If you notice a fossil, note its location, photograph it if possible and tell a ranger. Do not dig, collect or mark the ground.

GIVE PEOPLE AND WILDLIFE ROOM

Never feed or approach wildlife. Follow current park distances. Respect sacred places and living Tribal communities; seek their voices when learning about cultural connections.

USE THE PACKETS YOUR WAY

Read aloud, skip a puzzle or choose a different age level. Ask “What clue helped you?” instead of rushing to an answer. A favorite memory can be a small detail.

Official starting points: nps.gov/badl | nps.gov/wica | nps.gov/jeca

Sources for curious families

These primary sources support the facts in the activities. The editable source package includes the detailed fact and puzzle-verification records.

Oreodonts and fossil teeth

https://www.nps.gov/articles/000/oreodont.htm

Badlands rock layers and erosion

https://www.nps.gov/articles/000/badl-geologic-formations.htm

Fossil care and context

https://www.nps.gov/articles/000/badl-fossil-slab-faq.htm

Wind Cave boxwork

https://www.nps.gov/wica/learn/nature/speleothems-boxwork.htm

Jewel Cave calcite formations

https://www.nps.gov/jeca/formations-of-jewel-cave.htm

Bison and mixed-grass prairie

https://www.nps.gov/articles/000/prairie-ecology-badl.htm

Prairie dogs and linked habitats

https://www.nps.gov/articles/000/prairie-dogs.htm

Black-tailed prairie dog diet

https://www.fs.usda.gov/pnw/pubs/gtr332/Part1.pdf

Black-footed ferrets

https://www.nps.gov/articles/000/black-footed-ferret-wica.htm

Sources checked October 26-27, 2026. The editable package contains the detailed fact and puzzle records. Retained WBF art and new educational diagrams support the activities.

Sources for curious families

These primary sources support the facts in the activities. The editable source package includes the detailed fact and puzzle-verification records.

Lakota connections and named community voices

https://www.nps.gov/wica/learn/historyculture/the-lakota-emergence-story.htm

Wind Cave history

https://www.nps.gov/wica/learn/historyculture/index.htm

Wind Cave and Badlands designation dates

https://www.nps.gov/subjects/npscelebrates/park-anniversaries.htm

Jewel Cave monument designation

https://www.nps.gov/jeca/learn/historyculture/becoming-a-monument.htm

Regional locator geography

https://tigerweb.geo.census.gov/tigerweb/

Wind Cave location and directions

https://www.nps.gov/wica/planyourvisit/directions.htm

Jewel Cave location and directions

https://www.nps.gov/jeca/planyourvisit/directions.htm

Sources checked October 26-27, 2026. The editable package contains the detailed fact and puzzle records. Retained WBF art and new educational diagrams support the activities.