

WILDERLAND LEARNING TRAILS

# The Creeping Desert

One shared story - three age levels - one family roundtable

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# Trail 2 • The Creeping Desert

Earth Science • Ecology • Water Cycle • Systems • Restoration

**Story connection: The Aridites' geoglyphs disrupt the Wilderland's moisture balance. The book's drought creates a natural bridge into the real water cycle, land degradation, feedback loops and environmental restoration.**

**Paper and pencil**

**Optional colored pencils**

Access to a trusted water-cycle diagram or the sources listed at the end

## TRAIL 2 • THE CREEPING DESERT

**Upper Elementary • Grades 4-5**

### **Learning goals**

Identify evaporation, condensation, precipitation, runoff and infiltration.

Show that water moves through a connected system.

Describe two ways drought affects living things.

Suggest a practical action that helps keep water in soil or landscapes.

### **Student Challenge • Repair the Water Cycle**

1. Draw a large circle and place these five water-cycle processes around it: evaporation, condensation, precipitation, runoff and infiltration. Connect them with arrows.
2. Add the sun, a cloud, a river or lake, soil, and a plant. Draw where water moves.
3. Now imagine a geoglyph causes less water to soak into the ground. Cross out or weaken one arrow. What happens next? Add two "because" statements showing cause and effect.
4. Choose one repair: more plant cover, a place that catches runoff, healthier soil, or another idea. Draw how your repair helps water stay in the system.
5. Write 4-6 sentences: "If I were Timbit, I would try \_\_\_ because \_\_\_."

### **Optional mini-observation**

After rain, compare two small outdoor surfaces - bare soil/pavement and planted soil. Which holds or absorbs water longer? Observe only; no special experiment is required.

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# TRAIL 2 • THE CREEPING DESERT

## Middle School • Grades 6-8

### Learning goals

Model water cycling through Earth systems.

Explain a positive (self-reinforcing) feedback loop.

Connect drought/land degradation with human and natural causes.

Design an intervention and predict benefits and unintended consequences.

### Student Challenge • Break the Loop

Build a feedback loop beginning with "less vegetation" or "less infiltration." Use at least six linked steps. Your loop must eventually reinforce the starting condition.

1. Label each arrow with a verb phrase: "causes more...", "reduces...", "increases...", etc.
2. Mark two points where the loop could be interrupted.
3. Research one real strategy for conserving soil or water. Use one authoritative source from the source list.
4. Create a one-page intervention plan containing: problem, mechanism, expected benefit, one cost/constraint, and one unintended consequence.
5. Conclude with a claim: "This would / would not work in the Wilderland because..." Support it with evidence.

### Parent notes

The student should understand that "positive feedback" means self-reinforcing, not beneficial.

Allow a range of interventions if the mechanism is explained correctly.

The purpose is systems thinking, not a political conclusion.

# TRAIL 2 • THE CREEPING DESERT

## High School • Grades 9-12

### Learning goals

Synthesize scientific information from authoritative sources.

Evaluate environmental interventions using ecological, economic and practical criteria.

Distinguish correlation, mechanism and assumption.

Write a recommendation that acknowledges uncertainty and tradeoffs.

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## Student Challenge • Restore the Evenplain

You are advising a regional council after the geoglyphs have been stopped. The land is still damaged. Compare three real restoration approaches and recommend a recovery strategy.

1. Choose three interventions from this list or substitute another evidence-based approach: soil-cover restoration, rainwater capture/infiltration, wetland or riparian restoration, efficient irrigation, reforestation/agroforestry, groundwater recharge.
2. Use at least three authoritative sources total, including one U.S. government or international scientific source.
3. For each intervention, summarize mechanism, likely benefit, limitation/cost, timescale, and one risk.
4. Create a weighted decision matrix using at least four criteria.
5. Write an 800-1,000 word council memo recommending a phased plan. Include a paragraph explaining what evidence you would collect during the first year to test whether the plan is working.

## Family roundtable

Discuss: "What is the difference between stopping damage and restoring a system?" Ask each age band for one example.

The story comes first. Use this trail when it makes the reading richer.