Student Questions for Prairie Dogs

Exploring Ecosystems Through Bloom's Taxonomy

This document provides example questions that middle and high school students might ask a prairie dog living on a Southern Plains Land Trust (SPLT) preserve in Colorado. Questions are organized by Bloom's taxonomy levels and aligned with NGSS standards for understanding interdependent relationships in ecosystems, ecosystem interactions and dynamics, and biodiversity and ecosystem services.

Integration Notes for Educators

- **Scaffolding:** Build from Level 1 (Remember) to Level 6 (Create) across a unit or allow students to choose their own question level based on readiness. Modify or remove scaffolds as students gain confidence in asking and reasoning about ecosystem questions.
- **Celebrate critical thinking:** Encourage Evaluate and Create questions—these show deepest engagement with NGSS standards.
- **NGSS Alignment:** All questions connect to three core standards: Interdependent Relationships in Ecosystems, Ecosystem Interactions & Dynamics, and Biodiversity & Ecosystem Services.
- **Pair with Data:** Have students gather observational or research evidence to support their answers, strengthening NGSS science practices.
- **Real-World Connection:** Frame these as conversations with an actual prairie dog on the SPLT preserve to increase engagement and relevance.
- **Fact-Checking:** All factual claims should be verified against SPLT materials and the provided sources in the SPLT document.

Level 1: Remember - Recall & Define

Bloom's Focus: Recall facts and basic information
NGSS Connection: Students identify and describe key organisms and their roles in ecosystems.

Example Questions

1. How many other species depend on your burrows for shelter?

2. What types of predators hunt prairie dogs like you?
3. Can you describe what your burrow system looks like underground?
4. What do you eat when you're grazing on the prairie?
5. How many prairie dogs live in your colony?
6. What percentage of prairie dog habitat is still around today?
7. Which endangered species uses your burrows for survival?

Teacher Tip: Start with factual recall questions to establish baseline knowledge before moving to higher-order thinking. These questions help students gather information from the prairie dog "expert."

Level 2: Understand - Explain & Interpret

Bloom's Focus: Explain concepts and describe relationships
NGSS Connection: Students explain how organisms interact and how prairie dogs influence ecosystem components.

Example Questions

1. Why do you think scientists call prairie dogs a "keystone species"?
2. How do your burrows help other animals survive on the prairie?
3. Can you explain how your grazing habits help different plants grow?
4. What would happen to the soil if prairie dogs like you disappeared?
5. Why are predators like eagles and coyotes important for your ecosystem?
6. How does your waste act as a fertilizer for the grassland?
7. Why do you think myths about prairie dogs spread for so long?

Teacher Tip: These questions ask students to explain relationships and cause-and-effect patterns. Encourage students to use evidence from the SPLT document to support their explanations.

Level 3: Apply - Use Information in New Contexts

Bloom's Focus: Use knowledge in new or realistic situations
NGSS Connection: Students apply ecosystem concepts to solve problems and understand services provided by prairie dogs.

Example Questions

1. If a rancher is worried about prairie dogs on their land, what evidence would you show them about how you actually help the soil?

2. How could your colony help restore a degraded grassland area?
3. If you could design a prairie that needs to be resilient to drought, what role would you play?
4. How would you explain to someone afraid of plague that you're actually at risk, not a threat?
5. What ecosystem service do you provide that helps keep predator populations healthy?
6. If habitat loss continues at the current rate, how might this affect the 150 species that depend on you?

Teacher Tip: Have students role-play these scenarios where they must defend the prairie dog's ecological value to skeptics or solve conservation challenges.

Level 4: Analyze - Break Down & Examine Relationships

Bloom's Focus: Examine relationships, compare, and break down complex systems
NGSS Connection: Students analyze interactions between organisms and how changes in one species affect the entire ecosystem.

Example Questions

1. How do your burrowing, grazing, and social behaviors work together to shape the entire prairie ecosystem?
2. What's the relationship between prairie dog population decline and the endangered black-footed ferret's survival?
3. How would the food web change if prairie dogs disappeared from this preserve?
4. Why is the loss of 98% of prairie dog habitat more critical than just a number?
5. How do your interactions with soil, plants, and predators create a connected system?
6. What's the difference between your actual impact on cattle operations versus the myths people believe?
7. How does water absorption in aerated soil connect to grassland resilience?

Teacher Tip: Ask students to create food webs or concept maps showing these relationships. Challenge them to identify how removing prairie dogs creates a cascade effect through the ecosystem.

Level 5: Evaluate - Justify & Assess

Bloom's Focus: Make judgments, justify decisions, and assess trade-offs
NGSS Connection: Students evaluate biodiversity conservation strategies and ecosystem

service value.

Example Questions

1. Which is more important for the prairie: protecting prairie dogs or protecting the 150 species that depend on them, and why?
2. Given that prairie dog habitat has declined 98%, what should be the highest priority for SPLT—habitat restoration, public education, or legal protection?
3. Do you think the benefits you provide to soil health and plant diversity outweigh the concerns some ranchers have? Why or why not?
4. How would you convince someone who believes the myths about plague and livestock to support prairie dog conservation?
5. Should humans invest more resources in protecting a "small rodent" when other large mammals need help too? Defend your answer.
6. What's the strongest argument someone could make *against* prairie dog conservation, and how would you counter it?

Teacher Tip: Encourage students to support their judgments with evidence from SPLT materials and ecosystem science. Have them debate different conservation priorities.

Level 6: Create - Designing Solutions & Proposing New Ideas

Bloom's Focus: Synthesize ideas, design solutions, and envision new possibilities
NGSS Connection: Students design ecosystem restoration plans and develop innovative biodiversity solutions.

Example Questions

1. How would you design a prairie restoration project that uses prairie dogs as the foundation for rebuilding an entire ecosystem?
2. If you could create a public education campaign to change people's minds about prairie dogs, what would be your key message and why?
3. Imagine you're designing a conservation agreement between SPLT, ranchers, and wildlife advocates—what would you include to protect your species while addressing everyone's concerns?
4. What new research question about prairie dogs and ecosystem health would you want scientists to investigate, and why?
5. How could prairie dogs play a role in solving problems like soil degradation or climate resilience in grasslands?
6. Design a long-term plan to expand prairie dog habitat from 2% back to a healthy percentage—what steps would come first, second, and third?
7. If you could partner with one other species to create an even more resilient prairie ecosystem, who would it be and what would that partnership look like?

Teacher Tip: Use these questions as capstone projects where students develop detailed proposals, visual designs, or multimedia presentations. Encourage creativity while grounding solutions in ecosystem science.

Classroom Implementation Tips

For a Warm-Up Discussion Select 2–3 questions from different Bloom's levels before students interview the animal. Discuss what type of thinking each level demands and why scientists ask questions at all levels.

For Guided Inquiry Have students progress through levels in order:

- **Remember/Understand:** Gather baseline facts about the animal's life and basic ecosystem relationships.
- **Apply/Analyze:** Deepen understanding of dependencies and cause-effect chains.
- **Evaluate/Create:** Synthesize learning and propose evidence-based solutions.

For Differentiation

- **Middle school students:** Focus on Remember through Analyze questions.
- **High school students:** Emphasize Analyze through Create questions.
- **Advanced learners:** Combine questions from multiple levels into a single, complex inquiry.

For Assessment Use Evaluate and Create level responses to assess whether students can:

- Defend claims about interdependent relationships with specific evidence.
- Explain ecosystem dynamics and feedback loops.
- Propose conservation solutions that balance competing needs and services.