

# The Perilous Plight of the Pika

*Adapted from the research of Lisel Erb, University of Colorado*

by

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## Introduction

Katie, a creative writing major, was about to begin a hike up Mount Bierstadt, a mountain peak in Colorado more than 14,000 feet in elevation, with her best friend Mary, an environmental science major. This was a new tradition for the two of them since they moved out to Colorado. “Isn’t this the most beautiful place you’ve ever seen?” asked Katie.

“It really is. I just hope it stays that way,” replied Mary. “I’ve been learning some interesting stuff about what’s happening to this planet in my environmental science classes, but it can almost be too much to handle! Sometimes I even feel depressed after I walk out of there.”

Katie looked over at Mary with a surprised expression. “Your classes depress you? You should become a creative writing major. We talk about all kinds of issues and feelings, but we never seem to walk out of class depressed!”

Mary thought for a moment. “Well, I’d rather be aware of what’s going on with climate change and be mildly depressed than blissfully out of the loop. Besides, if I wasn’t aware of the problem, I couldn’t be part of the solution.”

“Good point,” said Katie, “but I’m aware of climate change. At least it’s not a factor way up here in these mountains.”

“I wish that were true, but we were just talking about this in class yesterday,” said Mary. “Some of the animals on this very mountain are being affected, even way up at this altitude.”

“Seriously? Tell me more. But go easy on me; I don’t want to be sad while we hike up this beautiful mountain!” Katie exclaimed.

“Well, we’re going to be here for the entire day. I’ll give you clues as we ascend and we’ll see if you are more of an environmental scientist than you thought,” Mary challenged.

“Ok, that sounds fun!” Katie replied.

The two girls strapped on their packs and began their ascent. As they hiked, Mary made sure to point out all sorts of different parts of the mountain ecosystem, such as vegetation, temperature, elevation, and snowpack. As they increased in elevation, Katie observed that all of these factors that Mary had just talked about were changing. “Mary, is it normal for the plants to change like this as we go up the mountain? I also noticed that I needed to put on another layer because it seems to be getting cooler up here. Brrr!”

Mary laughed to herself. “Now you understand why I told you to pack extra clothes for this hike, right? But yes, all of this is normal. When we get to the summit, we’ll put all of this together and I’ll tell you all about one of my favorite animals up here—the American pika.”

Katie, a devoted animal lover, searched for her binoculars in her pack. “Glad I brought these, I can’t wait to see the wildlife up here!” she exclaimed. Mary chuckled again. “I’m glad you brought those too, because pikas can be very tough to see due to their size and their color. They blend right in with the rocks. But the pika is exactly what we’ll be talking about when we get to the summit. One of my friends is a wildlife biologist and filled me in on some thought-provoking things that are happening with the pika that I think you’ll find interesting.”

“Sounds like a plan!” said Katie.

Luckily, Mary’s wildlife biologist friend had made a video all about the pika, so you can view that video now to get the information Mary is about to tell Katie. Complete Worksheet #1 as you watch “The Perilous Plight of the Pika” at [https://youtu.be/US\\_Hy\\_eGptg](https://youtu.be/US_Hy_eGptg).

# Worksheet #1

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

Watch the video “The Perilous Plight of the Pika” ([https://youtu.be/US\\_Hy\\_eGPtg](https://youtu.be/US_Hy_eGPtg)) and answer the following questions.

1. Pikas are most closely related to which type of animal? \_\_\_\_\_
2. How many species of pika are there worldwide? \_\_\_\_\_ In North America? \_\_\_\_\_
3. What characteristics make a pika unique? \_\_\_\_\_  
\_\_\_\_\_
4. What do pikas look like (how big are they, distinguishing characteristics)? \_\_\_\_\_  
\_\_\_\_\_
5. What do pikas eat? \_\_\_\_\_
6. Where do they get their drinking water? \_\_\_\_\_
7. Where do pikas live? \_\_\_\_\_
8. What is talus? \_\_\_\_\_
9. What are haypiles? \_\_\_\_\_  
What type of plants do pikas use to make their haypiles? \_\_\_\_\_
10. Why do pikas sometimes use poisonous plants in their haypiles and why doesn't it harm the pikas? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
11. How old are pikas when they can first reproduce? \_\_\_\_\_
12. How many litters do female pikas have each year? \_\_\_\_\_
13. How are pikas sensitive to temperature? \_\_\_\_\_  
\_\_\_\_\_
14. Do pikas hibernate? \_\_\_\_\_
15. What temperature is too hot for pikas? \_\_\_\_\_ What temperature is too cold? \_\_\_\_\_
16. How do pikas protect themselves from the heat? \_\_\_\_\_  
\_\_\_\_\_
17. How do they protect themselves from the cold? \_\_\_\_\_  
\_\_\_\_\_

By this time, the girls had reached the summit. “Wow! The pika is so cute, but it sure has a lot of strict requirements to live where it does, doesn't it?” asked Katie.

“That's exactly my point! Since they have such specific environmental necessities, scientists are watching them very closely, because they think they could be indicators of climate change,” Mary explained. “So, now that you're an expert on the pika, when we get home, would you like to help me with my pika project for my environmental science class?”

“That actually sounds fun!” Katie exclaimed. “But let's do it tomorrow. I'm already exhausted from this hike!”

## Worksheet #2

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

Now you can help Mary with her environmental science project. Complete this worksheet in class by referring to the previous information from the video “The Perilous Plight of the Pika” ([https://youtu.be/US\\_Hy\\_eGPtg](https://youtu.be/US_Hy_eGPtg)).

1. Now that you have watched the video, list the variables that can determine where pikas will be found. \_\_\_\_\_

\_\_\_\_\_

2. Now that you have listed these variables, you are going to form some hypotheses. The table below lists important data about pikas and different parameters. Pick two sets of data that you would like to correlate and graph that data in the spaces provided on the following page. (For example, number of years occupied correlates to elevation, etc.)

*Number of Years Occupied:* how many times over a four-year period pika territories were occupied.

*Elevation:* elevation in meters where sites were located.

*Average Precipitation:* total annual precipitation (rain and snow).

*Plant Nutrition:* amount of edible plant vegetation in site area.

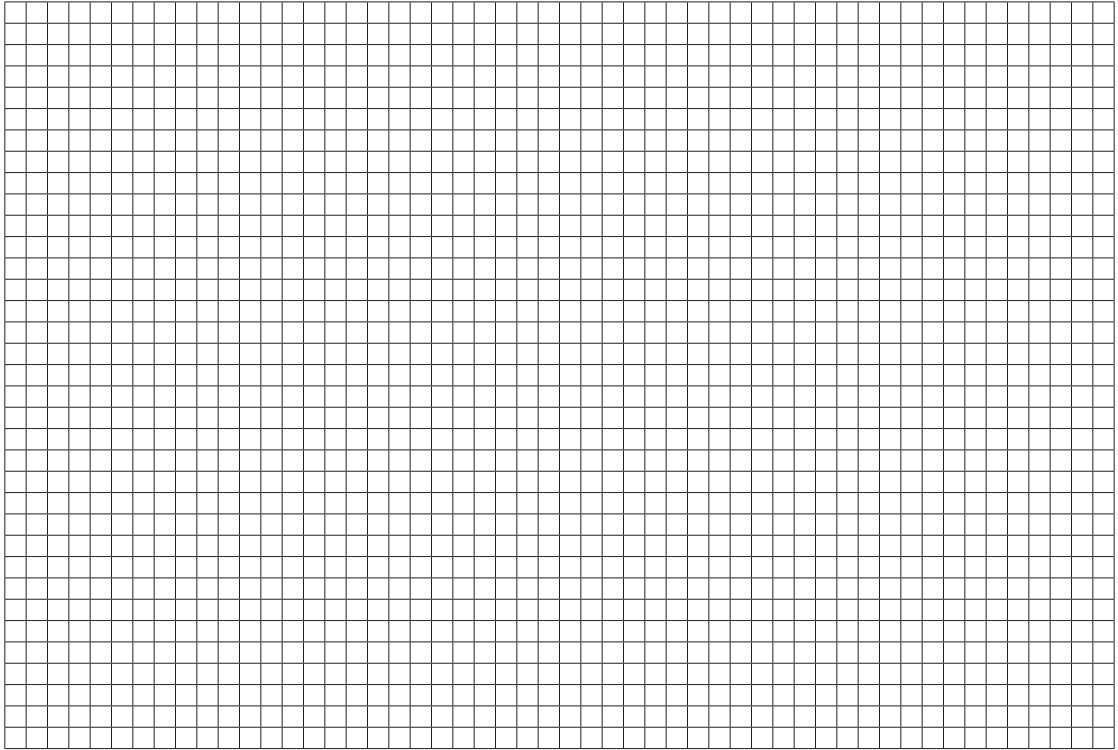
*Average Summer Temperature:* in Celsius.

Site Name	Number of Years Occupied	Elevation (m)	Average Precipitation (mm)	Plant Nutrition	Average Summer Temp (C)
Bighorn Peak	3	3325	718	high	9.4
Trap Lake	4	3035	922	high	7.3
Grand Lake	0	2703	595	low	14.2
Pagoda Peak	4	3361	1134	high	10.7
Papoose Basin	3	2832	719	high	11.5
Halfmoon Creek	3	3395	963	low	11.6
Mount Gothic	4	3518	960	high	6.4
Grand Mesa	3	3099	835	high	8.9
Cochetopa	0	3394	433	low	15.4
Crystal Lake	4	3593	607	high	10.4
Kennebec	4	3568	1089	high	7.4
Wolf Creek Pass Road	4	3468	1063	high	12
Del Norte	4	3605	788	high	9
Bridger Peak	4	3339	1477	high	9
Silver Lake	4	3164	1283	high	8.1
WY Aspens	1	3044	914	low	12.9
Nambe Lake	3	3708	894	high	9.5

Source: Data from Liesl Erb, ScienceLive, <http://www.science-live.org/pikas/data.html>.

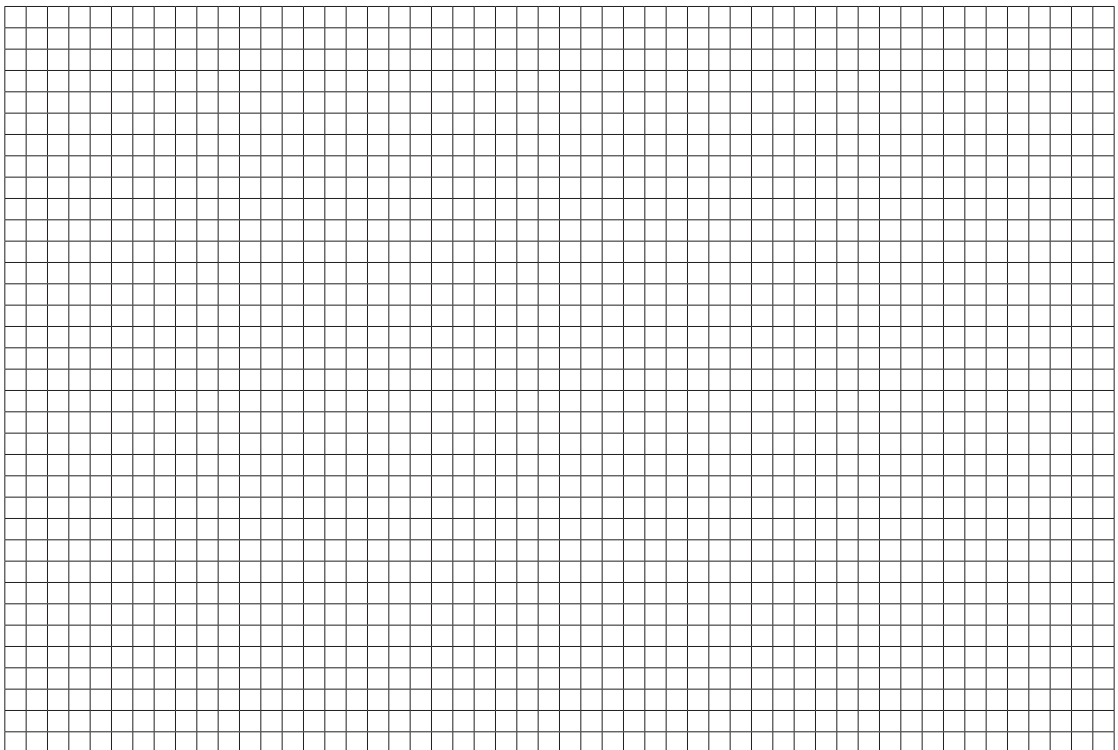
Hypothesis #1:

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Hypothesis #2:

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3. Were the graphs that you created conclusive in any way? \_\_\_\_\_

4. Did you prove or disprove hypothesis #1? \_\_\_\_\_

5. Did you prove or disprove hypothesis #2? \_\_\_\_\_

*Now you need to analyze your data. Use the information from the first part of this activity.*

6. Why did you find the results that you did for graph #1? \_\_\_\_\_

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7. Why did you find the results that you did for graph #2? \_\_\_\_\_

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8. If global temperatures continue to rise, how will the pikas be affected in the summer? \_\_\_\_\_

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9. If you were a pika, how could you acclimate behaviorally or physiologically to deal with this issue in the summer? \_\_\_\_\_

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10. If global temperatures continue to rise, how will the pikas be affected in the winter? \_\_\_\_\_

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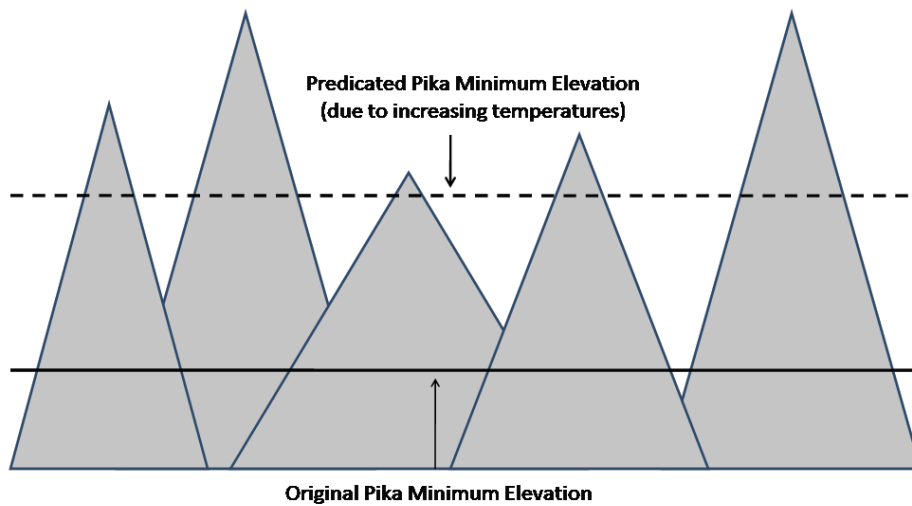
11. If you were a pika, how could you acclimate behaviorally or physiologically to deal with this issue in the winter? \_\_\_\_\_

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It has been hypothesized that pikas may be moving up in elevation to find cooler temperatures in the summer and more snowpack in the winter. If this is the case, the following diagram shows how this would look:



12. Using this diagram, think about the genetic variation in these populations. Would this increase genetic diversity or decrease it in these populations? Why or why not? \_\_\_\_\_

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13. Now that you have analyzed actual scientific data about the pika, do you think pikas are indicator species for climate change? Why or why not? \_\_\_\_\_

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14. What do you personally think is the destiny of the pika? Do you think they will adapt and continue to survive or will they eventually go extinct as a result of climate change? Explain your answer. \_\_\_\_\_

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“So, do you still believe that climate change doesn’t affect anything high up in the mountains?” Mary asked.

“Well, I’m glad I didn’t figure this out until I was home so I didn’t get all depressed on that hike. But you’ve got a point—climate change can even reach way up there above 14,000 feet! I had no idea,” Katie said.

“Does this mean you want to change majors over to environmental science now?” Mary asked.

Katie laughed, “Don’t get your hopes up. But maybe I’ll look into writing papers related to environmental science. This is something that affects all of us, so why not?”

“Ok, tell you what—I’ll keep you posted on the pika and if anything big happens, you can write about it in the school paper, ok?” Mary said.

“Deal!” Katie exclaimed.