



EFFECT OF SNOW PACK AND CONNECTIVITY ON PIKA Teacher Information

Learning goals:

- Understand how snow pack, climate change and habitat connectivity can impact the American pika.

Materials:

- Power point placards, summer and winter condition cards
- Round balloons
- Ruler
- Walkin' Jim Stoltz Pika Pika song
http://walkinjim.com/media/10._Pika_Pika.mp3
- Student worksheet

Teacher Instructions:

- Divide room two halves. One half represents the Great Basin and the other the Southern Rockies.
- Try to arrange the desks as indicated on the diagram in the power point.
- Place one placard and a map of the region at each seat for the Great Basin. Do the same with the placards for the Southern Rockies.
- Place a summer and a winter card at each seat face down.
- Have students stand near a seat
- Musical Chairs style – Have students walk around the “mountain ranges,” while playing the Walkin' Jim Stoltz Pika Pika song (or some other song).
- Students take a seat and follow the instructions on the worksheet.

Student Instructions:

1. Answer questions and follow directions on the worksheet.
2. Once they have made it through Question 12, draw the following chart on the board so they can complete Question 13:

	HOT Summer	COOL Summer
HIGH Snow		
LOW Snow		



EFFECT OF SNOW PACK AND CONNECTIVITY ON PIKA Student Worksheet

1. On which Mountain range do you/your pika live?
 - a. A Great Basin Mountain Range
 - b. Southern Rocky Mountain Range
2. On which peak do you/your pika live?
 - a. Ruby Range, Nevada
 - b. Toiyabe Range, Nevada
 - c. White Pine Range, Nevada
 - d. Toquima Range, Nevada
 - e. San Juan Mountains, Colorado
 - f. Sawatch Range, Colorado
 - g. Sangre de Cristo Range, Colorado
3. At what elevation do you live? _____ft.
4. Look at your mountain range diagram to determine if there are mountains connecting your mountain range with your closest neighbor (mountain habitat pikas can travel in is dark green, tan habitat is too hot). Could you travel to your nearest neighbor without going into a valley?
5. At what elevation does your closest pika neighbor live? _____ft.
6. Is your closest pika neighbor at a higher or lower elevation than you?
7. Look at your mountain range diagram to determine if there are mountains connecting your mountain range with your farthest pika neighbor. Can you travel there without going into a valley?
8. At what elevation does your farthest pika neighbor live? _____ft.

Pika haying season –Pikas have thick fur that keep them warm in the winter but in the summer they can't take the heat. They are found on cool rocky habitats where they can hide from the summer heat. Pikas feed on stems and leaves of various grasses, and small shrubs. By late June pikas begin clipping or pulling up stems and twigs, which they carry back to their haypiles to store under rocks and in crevices. Pikas do not hibernate so their survival during the winter is dependent on the success of their haying season.

Pika and snow pack – Pikas also rely on consistent snow pack to provide insulation during the winter months.

Follow the instructions below to determine your survival.

Summer

Cool: Haybank Value = +1 (full balloon)

Hot: Haybank Value = +1/2 (half full balloon)

Winter

High Snow = -1/4 (deflate balloon by 1/4)

Low Snow = -1/2 (deflate balloon by 1/2)

9. Turn over **Card 1** to reveal the type summer you experienced. What kind of summer did you have? Enter this value in the equation in #11.

- a. Cool – blow up balloon full
- b. Hot – blow up balloon 1/2 full

***A cool summer** means temperatures where good for collecting grass, stems etc. = a good haying season. Your haypile is full.*

***A hot summer** means temperatures too high, which limits the amount of time they can spend out collecting grass, stems etc. = a poor haying season. Your haypile is 1/2 full.*

10. Turn over **Card 2** to reveal the type of winter you experienced. What type of winter did you have?

- a. High Snow – deflate balloon by 1/4 or 25%
- b. Low Snow – deflate balloon by 1/2 or 50%

***A high snow winter** means snow pack was high enough to provide the pika good insulation, so they don't have to eat as much to stay warm.*

***A low snow winter** means not enough snow to provide the pika with good insulation for the winter season, so they have to eat more to stay warm.*

11. Record your numbers below and determine your survival.

$$\underline{\hspace{2cm}} \quad - \quad \underline{\hspace{2cm}} \quad = \quad \underline{\hspace{2cm}}$$

Summer Haybank Value - Winter Condition Value = Pika Condition Value

12. If your balloon is

- a. still inflated 1/2 or more, you are happy and looking forward to another season...you can stay in your seat. You are ☺.
- b. less than 1/2 full, you are stressed and will only survive another season if next summer is cool. Good luck! You are ☹.
- c. empty you did not survive the winter, please move to the back of the room. You are ☹.

13. On the chart on the board, fill in your current state (☺, ☹, or ☹) in the box that corresponds to your winter/summer conditions.

- a. Once everyone has done this, look at the chart. Which conditions are best for pikas?
- b. Which conditions are worst for pikas?

Discussion Opportunity:

14. For those who are still alive, you have successfully reproduced and now you are a pika several generations in the future. The climate has changed over the last 30 years and those of you living at or below _____ elevation must have moved up in elevation or died.
- a. Look at the elevation where you live, are you above or below 12,000 ft?
 - b. If there is a connected peak near you that is above 12,000 your offspring will move and survive.
 - c. If there is not a nearby higher elevation you and your offspring will not survive.

Great Basin Mountain Ranges

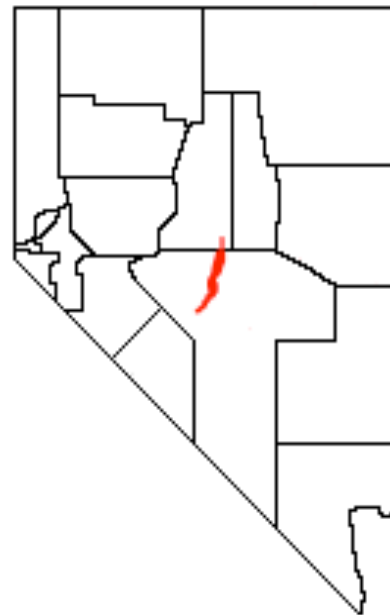
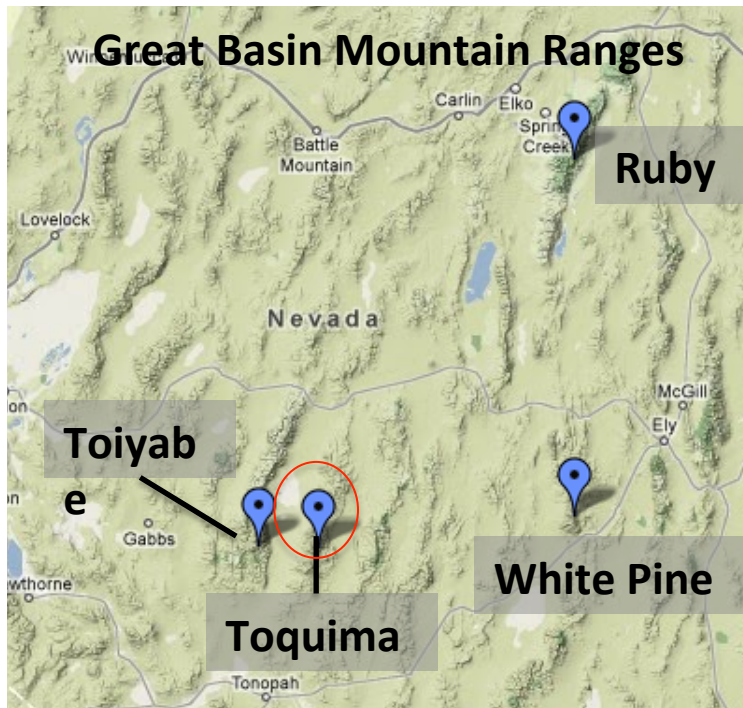


Colorado Mountain Ranges



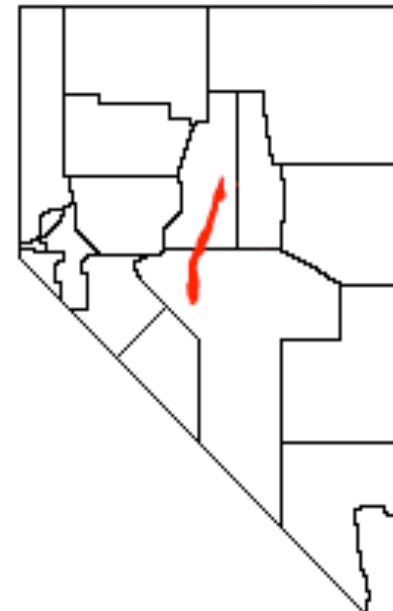
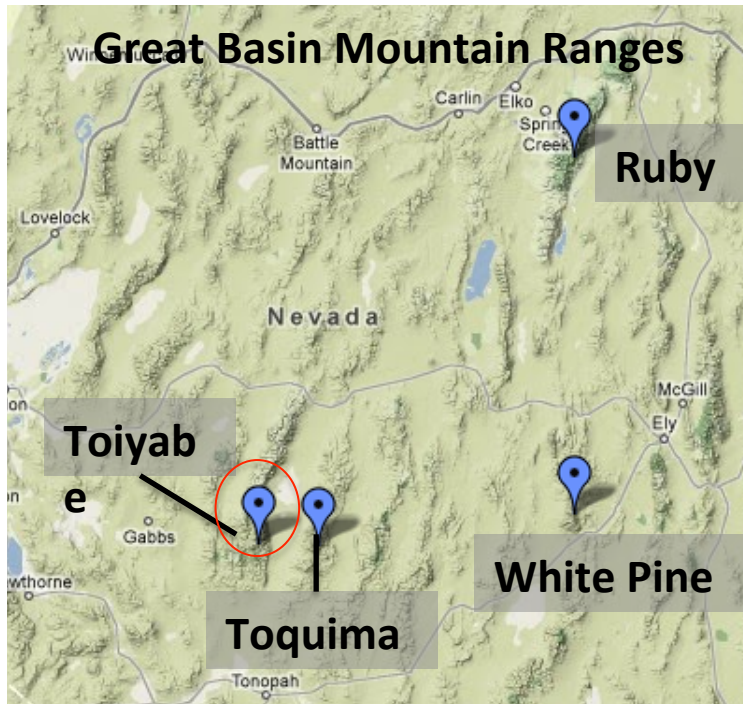
Toquima Range, Nevada

- High point 11,941 ft
- You live at 11,000 ft



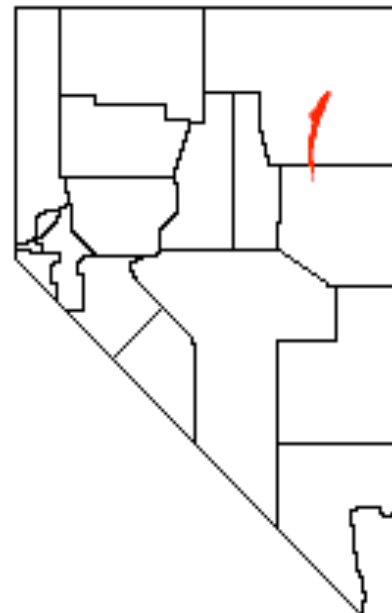
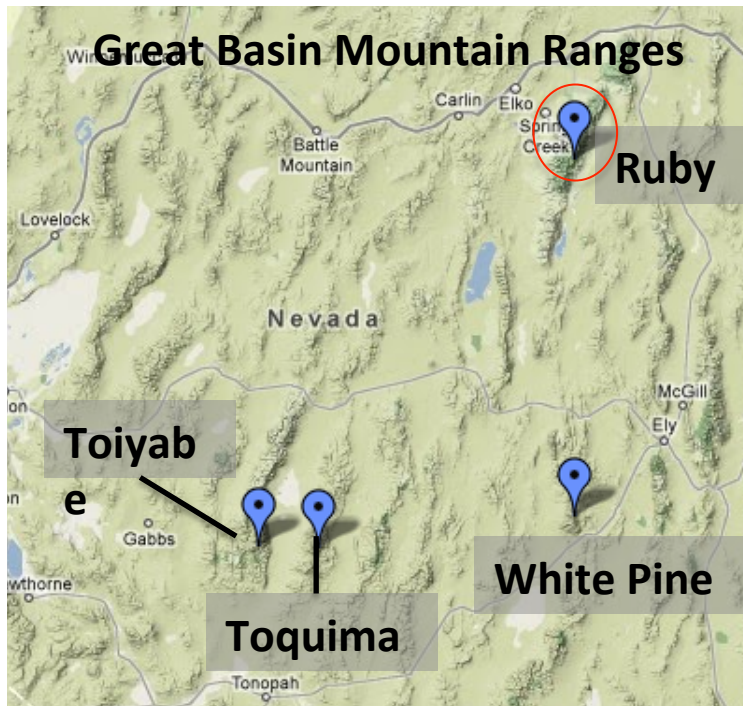
Toiyabe Range, Nevada

- High point 11,778 ft
- You live at 10,000 ft



Ruby Mountains, Nevada

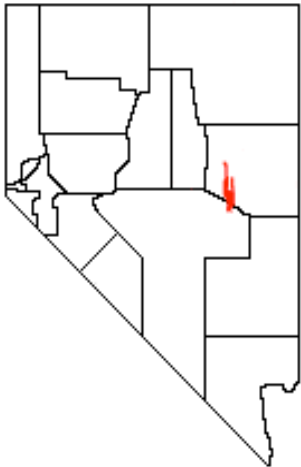
- High point 11,387 ft
- You live at 10,300 ft



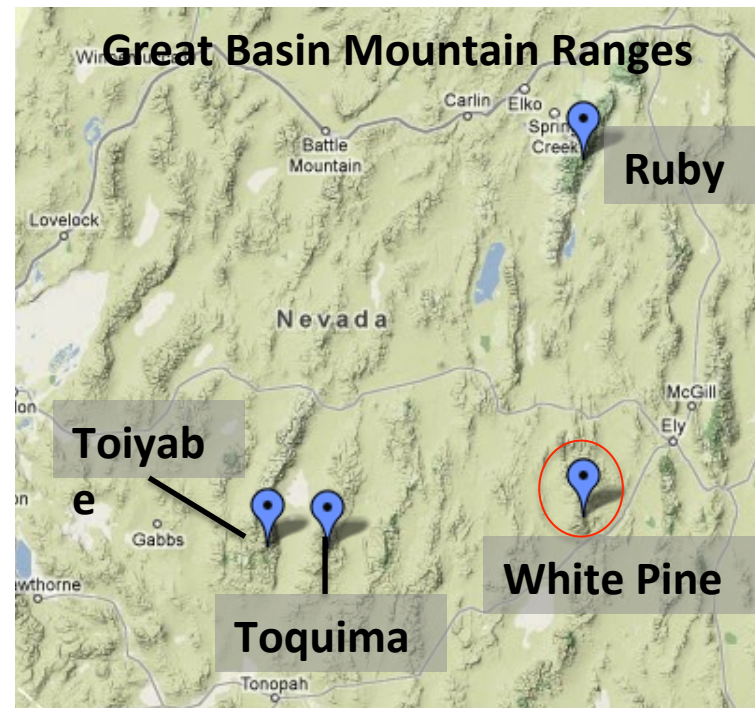
White Pine Range, Nevada



- High point 11,513 ft
- You live at 11,000 ft



© Jeff Mitton



Sawatch Range, Colorado

- High point 14,440 ft
- You live at 10,000 ft



© Jeff Mitton

San Juan Mountains, Colorado



- High point 14,309 ft
- You live at 11,000 ft



© Jeff Mitton



Sangre de Cristo Range, Colorado

- High point 14,351 ft
- You live at 12,000 ft





SUMMER

HOT

BALLOON: $\frac{1}{2}$ FULL
HAYBANK VALUE = $+1/2$



SUMMER

HOT

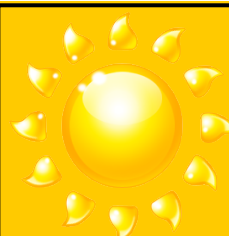
BALLOON: $\frac{1}{2}$ FULL
HAYBANK VALUE = $+1/2$



SUMMER

HOT

BALLOON: $\frac{1}{2}$ FULL
HAYBANK VALUE = $+1/2$



SUMMER

HOT

BALLOON: $\frac{1}{2}$ FULL
HAYBANK VALUE = $+1/2$



SUMMER

COOL

BALLOON: FULL

HAYBANK VALUE = +1



SUMMER

COOL

BALLOON: FULL

HAYBANK VALUE = +1



SUMMER

COOL

BALLOON: FULL

HAYBANK VALUE = +1



SUMMER

COOL

BALLOON: FULL

HAYBANK VALUE = +1



WINTER

HIGH SNOW

BALLOON: DEFLATE BY $\frac{1}{4}$

HAYBANK - $\frac{1}{4}$ = _____



WINTER

HIGH SNOW

BALLOON: DEFLATE BY $\frac{1}{4}$

HAYBANK - $\frac{1}{4}$ = _____



WINTER

HIGH SNOW

BALLOON: DEFLATE BY $\frac{1}{4}$

HAYBANK - $\frac{1}{4}$ = _____



WINTER

HIGH SNOW

BALLOON: DEFLATE BY $\frac{1}{4}$

HAYBANK - $\frac{1}{4}$ = _____



WINTER

LOW SNOW

BALLOON: DEFLATE BY $1/2$

HAYBANK $- \frac{1}{2} =$ _____



WINTER

LOW SNOW

BALLOON: DEFLATE BY $1/2$

HAYBANK $- \frac{1}{2} =$ _____



WINTER

LOW SNOW

BALLOON: DEFLATE BY $1/2$

HAYBANK $- \frac{1}{2} =$ _____



WINTER

LOW SNOW

BALLOON: DEFLATE BY $1/2$

HAYBANK $- \frac{1}{2} =$ _____

SUMMER 2

- COOL
- BALLOON FULL
- HAYBANK VALUE = +1

SUMMER 2

- HOT
- BALLOON $\frac{1}{2}$ FULL
- HAYBANK VALUE = $+1/2$

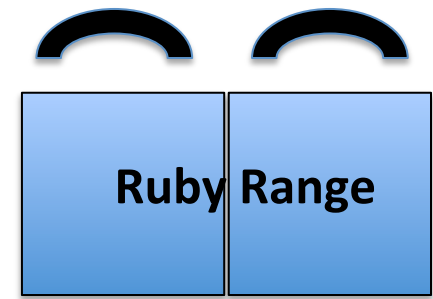
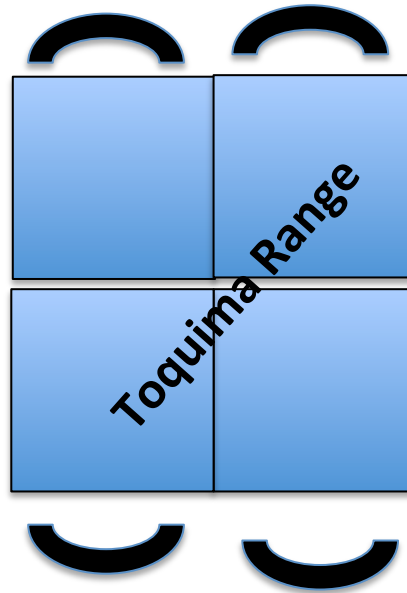
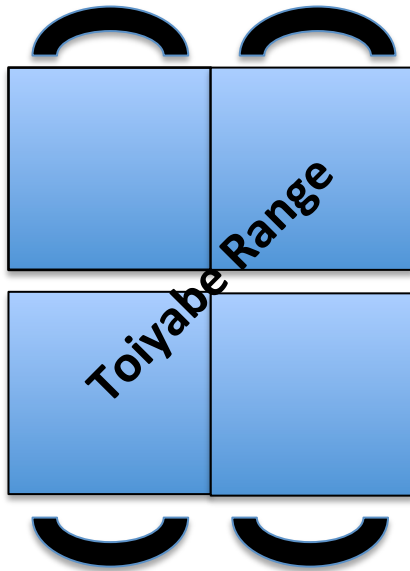
WINTER 2

- HIGH SNOW
- DEFLATE BALLOON BY 25%
or by $1/4^{\text{th}}$.
- HAYBANK VALUE $- \frac{1}{4} =$

WINTER 2

- LOW SNOW
- DEFLATE BALLOON by 50%
or by $\frac{1}{2}$.
- HAYBANK VALUE $- \frac{1}{2} =$

The Great Basin Mountain Range



The Southern Rocky Mountain Range

