

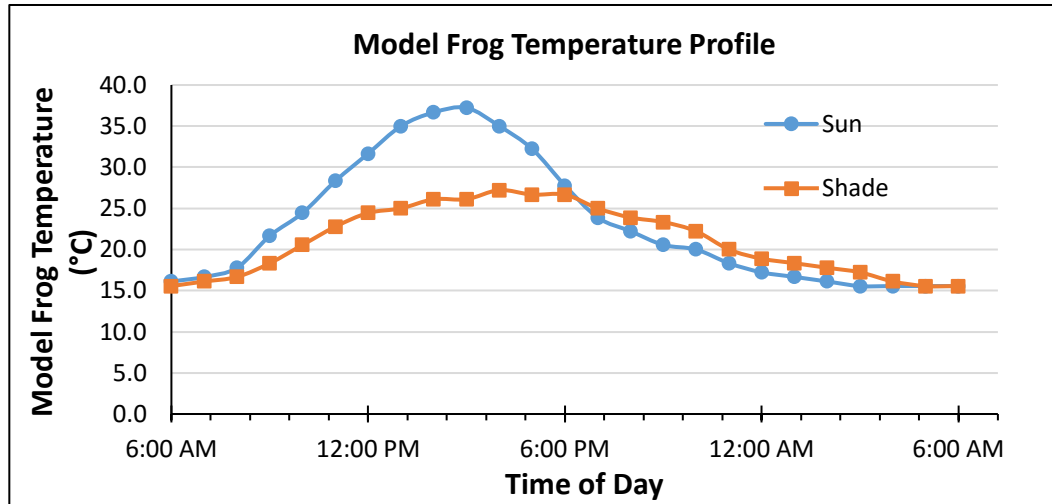
Name _____

Ectotherm ER: Frogs Under the Weather

Analysis

I. Model Frog Temperature Profile

Our ibutton data reflects frog temperatures collected over a 24 hour period. A graph of this information would look similar to the following:



II. Create Your Own Histogram

Use the ibutton data to create a histogram showing the number of times a frog reaches a certain body temperature range.

Step 1: Complete the following chart to tally how many times the frog's body temperature was within the given ranges.

Histogram Tally Chart			
Bin	Range	Sun Tally	Shade Tally
1	0 - 4 °C	0	0
2	4.1 - 8 °C	0	0
3	8.1 - 12 °C	0	0
4	12.1 - 16 °C	4	3
5	16.1 - 20 °C	7	8
6	20.1 - 24 °C	5	6
7	24.1 - 28 °C	2	8
8	28.1 - 32 °C	2	0
9	32.1 - 36 °C	3	0
10	36.1 - 40 °C	2	0

Step 2: Now use the Histogram Tally Chart to create a histogram on a separate sheet provided by your teacher.

Step 3: Use your histogram to answer the following questions.

1. What was the range of body temperatures that the 'sun' frog experienced? 15.6 - 37.5 C
2. How did the range of body temperatures that the 'shade' frog experienced compare to those of the 'sun' frog ? shade frog range was smaller (narrower)

Next, place the Frog's Jumping Performance Curve over your histogram.

3. Did any of your data fall outside the upper temperature limit for this species? yes

Explain The sun frog's temperature got higher than the upper thermal limit!

4. Look back at the Model Frog Temperature Profile in I, at what time of day and in which habitat did this occur? Around 3pm in the afternoon, in the sun habitat

5. What day-to-day activities might be affected by the frog's jumping performance? ability to escape from predators, catch prey, find a mate...
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6. What other environmental factors could affect a frog's behavior? how much moisture/water is available, predators, location of food, need to reproduce
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Next, place the Chytrid Fungus Thermal Performance Curve over your histogram.

7. At what temperature was the fungal population growing fastest? ~ 20 C
8. Above what temperature does the fungus no longer grow? 30 C

Next, place both the Frog's Jumping Performance Curve and Chytrid Fungus Thermal Performance Curve over your histogram.

9. For how many hours of the day was each frog too hot for the fungus to grow on its body?

of hours for the 'shade' frog 0

of hours for the 'sun' frog 6 (based on data table but 5 or 7 would be acceptable if looking at histogram)

III. Directions: Read each statement carefully. Answer the question in the space provided or perform the requested task.

- Look below at the Jumping Distance Performance Curves for a Tropical vs. Temperate frog.
At what high temperature is the tropical frog's jumping performance zero? 26 C
At what high temperature is the temperate frog's jumping performance zero? ~36 C
What does this indicate about the frog's health at this temperature? dead frogs can't jump!
- At 30°C, draw a straight vertical line that extends from the x-axis until it reaches the temperate frog performance curve. As you learned in Part II of this worksheet, the chytrid fungus cannot survive above 30°C. Shade the area of the frog's performance curve where it is too hot for the chytrid fungus to grow.
- Can the tropical frog survive at a temperature outside of the upper limit for the chytrid fungus? NO
- What does this indicate about the tropical frog's ability to fight infection? It cannot use heat to kill the fungus once it is on its body
- How might climate change affect the relationship between the frog and the fungus? Warmer temperatures might make it easier for the temperate frog to warm up to the point where any fungus on its skin would die.

