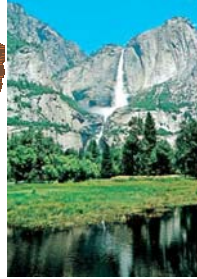


How far is the nearest National Park from the University of Akron Campus?

- A. 0- 10 miles
- B. 10-100 miles
- C. 100-200 miles
- D. 200-500 miles
- E. Even further



Where does wastewater from the UA campus eventually go?

- A. The Atlantic Ocean
- B. The Pacific Ocean
- C. The Gulf of Mexico
- D. Hudson's Bay
- E. It stays in Ohio
- F. I have no idea



Left Out in the Cold



A
Case
Study



Read the case study and think about the questions, ~5 min.

- Joel had been looking forward to his first backpacking trip to the Canadian Rockies for some time.....
- Joel also caught a frog near the car. He named it "Trevor" and put it in a box in his backpack.
- Think about how to apply the principles of Chapter 4 to this situation, especially:
 1. List several ways that Joel is exchanging heat with his environment
 2. What could Joel do to warm up? Why would it work?
 3. Construct a graph that illustrates how Joel's body temperature changes with air temperature.



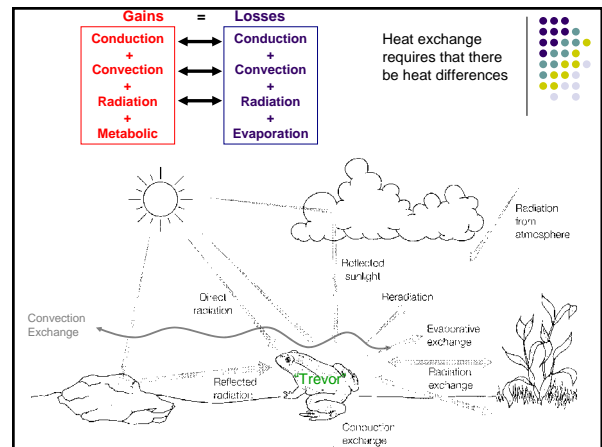
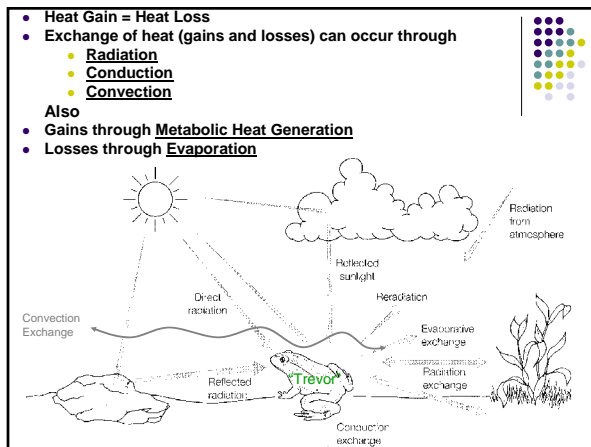
Case Study: Out in the Cold

- List several ways that Joel is exchanging heat with his environment



Case Study: Out in the Cold

- List several ways that Joel is exchanging heat with his environment
- Is this list different for Trevor?



If Joel had worn his winter clothes, which of the following would have been most effective in helping him stay warm?

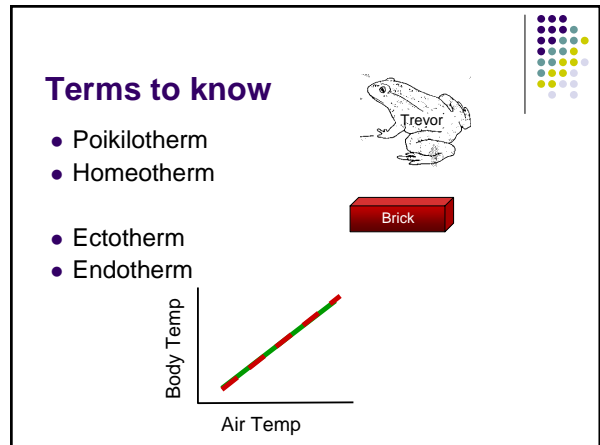
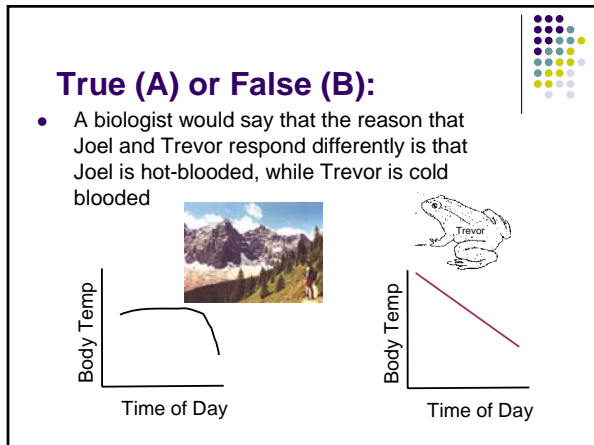
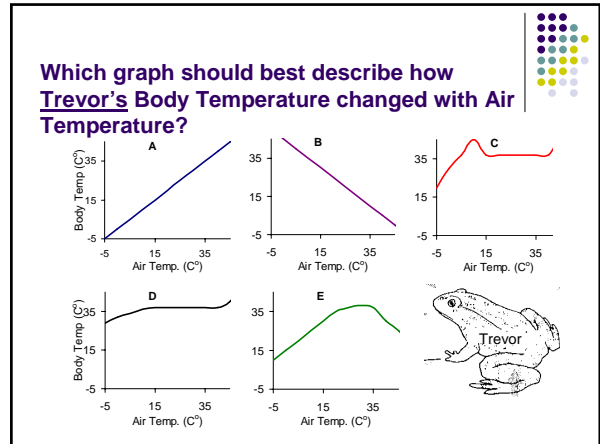
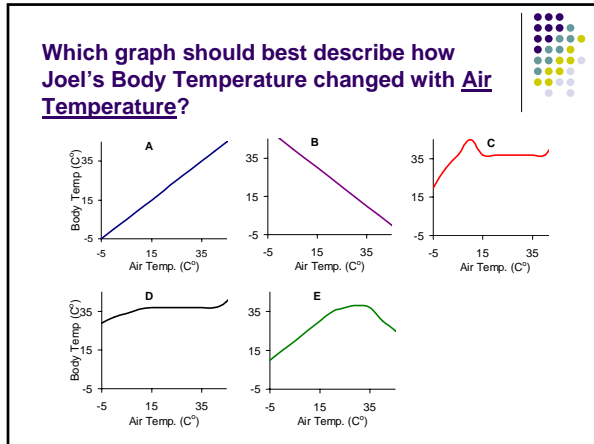
- More radiative heat gain
- More metabolic heat production
- Less convective heat loss
- Less conductive heat loss
- None of the above



After Joel fell in the creek he got colder. Which method of heat exchange is most responsible for his continuing chill?

- Conduction
- Convection
- Radiation
- Metabolism
- Evaporation





Antarctic Fish -1.8°C
(Very constant)

Dr. Londrville's Research

Desert pupfish 40°C
(Highly variable)

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