

Homeostasis: Running a Marathon

BEFORE THE FILM

1. The runner weighs 68 kg, or 149.6 lbs. She is going to run a marathon, which is 26.2 miles long. The following bodily indicators will be monitored during the athlete's run: weight, heart rate, core temperature, breathing rate, and blood glucose. Which of these do you expect to change during the course of a marathon? Explain why.

DURING THE FILM

2. The concept of **homeostasis** states that mechanisms in the body work together to maintain a _____ environment.
3. The _____ glands were the first body part to respond. Explain why.
4. At one kilometer (km) into the race the runner's _____ began to drop and the _____ doubled. Explain how these two indicators are related.
5. At 10 km the runner takes her first break. The thermographic image of the runner shows a dramatically increased core temperature. Which of the following is most effective in lowering/maintaining the body's core temperature: radiation/convection/evaporation? How does re-hydration play a part in your choice? Explain.

6. By 30 km the runner's liver glycogen and blood glucose are depleted.
_____ is broken down into _____ in order to continue the supply of energy for the muscles. What happens if an athlete has no fat reserve?
7. The runner dropped five kg (11 lbs) during the marathon. This is 7.35% of her initial body weight. This weight was in the form of _____ lost due to _____. She lost 5 liters of water in sweat! In order to make water available for maintain the body's core temperature, receptors trigger effectors in the _____, telling them to decrease urine production this is called _____ feedback.

AFTER THE FILM

8. Explain how each of the following body parts helps maintain homeostasis during physical activity such as the marathon:
- Brain:
 - Adrenal Gland/Adrenalin:
 - Muscles:
 - Heart:
 - Lungs:
 - Liver:
 - Kidneys: