Name _____ Date _____

Migration Cues Answer Key

Read the migration cues information below. Then, as you watch the video clips from *Great Migrations*, complete the chart with the internal and external cues for each animal.

External Migration Cues

- **Photoperiod**—as the seasons change, longer days in the summer or shorter days in the winter cue some animals to migrate. Less sun usually means lower temperatures, and more sun usually means higher temperatures.
- **Shifting Seasons**—as the seasons change, temperature and precipitation often also change. Many places have distinct wet and dry seasons. This can cue the animals that it is time to migrate.
- **Food and/or Water Availability**—a lack of food and/or water, due to extreme temperatures, less precipitation, or because of overcrowding (population pressure or an area reaching carrying capacity), also spurs some animals to move.

Internal Migration Cues

- **Fat reserves**—when fat reserves are too low, some animals move in search of new food supplies; other animals move only after fat reserves have been built up. For all species, it takes a certain amount of energy for an animal to migrate.
- **Circadian rhythms**—an internal calendar in an animal's nervous system can help an animal know when to migrate. Circadian rhythms refer to daily (24-hour) calendars and are affected by the Earth's daily rotation on its axis, as well as the yearly revolution of the Earth around the sun. Even without exposure to external stimuli, most animals have an innate sense of when to move because of these calendars. Scientists do not fully understand these rhythms, but do know that they are tied to patterns of brain activity, hormone production, and sleep and eating patterns that shift with time of day, photoperiod, and seasons. Humans are also affected by these rhythms; however, they do not cause us to migrate.

Animal	Internal Cues	External Cues
Wildebeest	Fat reserves	Shifting seasons: must follow the seasonal rains for fresh grass to eat
Red crab	Genes, circadian rhythms (reproduction)	Photoperiod: The waning moon and resulting mild tides
Sperm whale	Fat reserves; circadian rhythms (breeding); magnetic sensors in brain	Photoperiod (sun), sea currents, sonar
Monarch butterfly	Genes, circadian rhythms	Photoperiod (sun), sense of magnetic north