SCIENCE·3D

RATTLESNAKES

In this packet, sample student answers are provided in red and notes to teachers are in blue.

In this **Science Mission**, students will use evidence to support their ideas about how different traits help desert plants and animals survive. Then they will compare and contrast life cycles and use data to explore how weather affects rattlesnakes.

Activity 1: Built for the Desert

1. Next to each picture, write the appropriate adaptation from the list below in the "Adaptation" column.

   Adaptations:
   - Venom to kill prey
   - Hunt and live in family groups
   - Waxy leaves to keep water in the leaves
   - Shovel-shaped head to help "swim" through the sand
   - Tasty fruit to attract animals to eat the fruit and move the seeds
   - Active at night
   - Strong legs, good hearing, and fast reflexes
   - Instead of leaves, have pads with a thick covering
   - Many spines to shade the body of the plant from the sun
   - Grow fast and produce flowers right after rains
   - Pincers and venomous sting

2. Choose whether the adaptation helps the plant or animal **survive the climate and weather**, **avoid being eaten**, **get food**, or **reproduce**. Write your answer in the "How it helps" column.

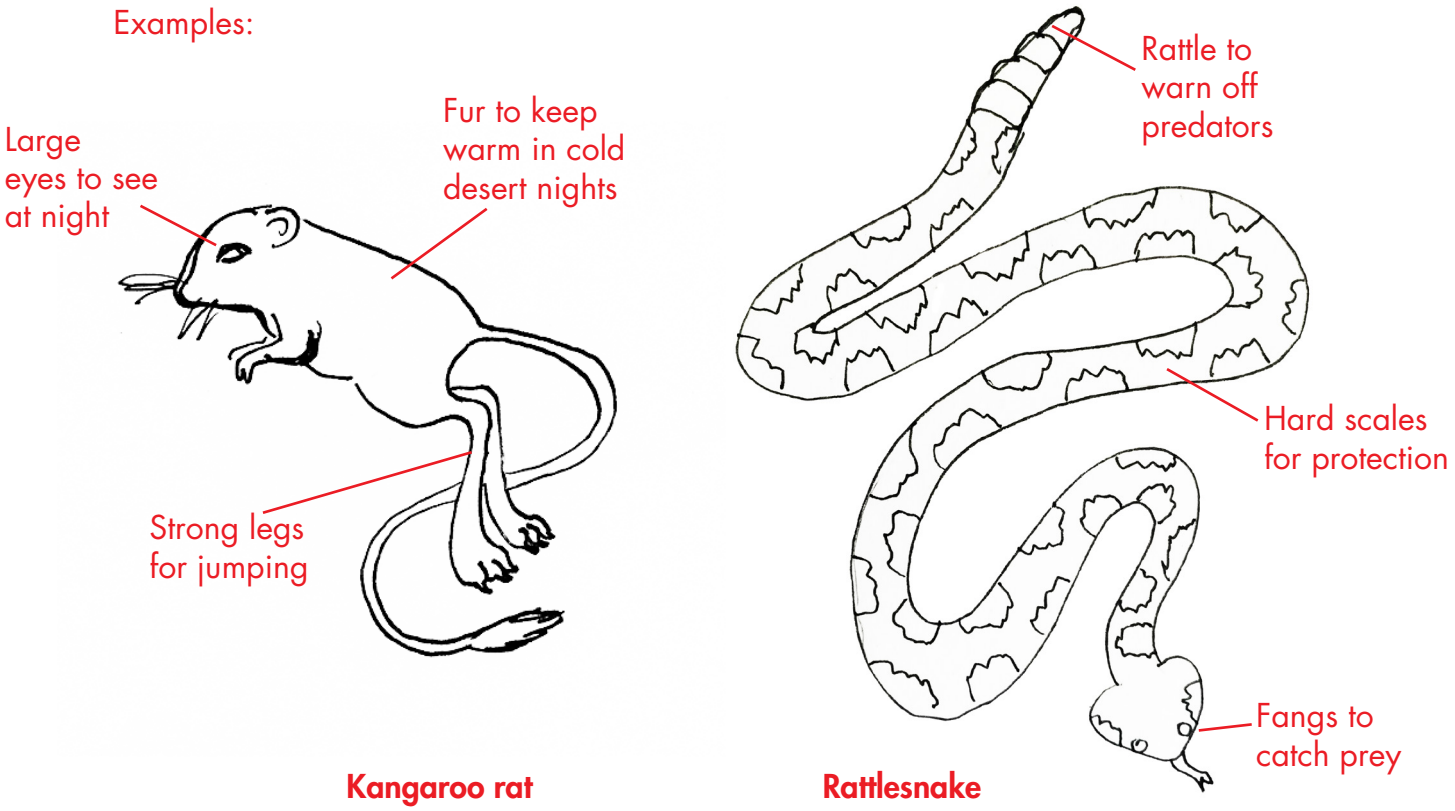
Organism	Adaptation	How it helps
 Harris's Hawk	Hunt and live in family groups	Get food; also acceptable to add avoid predators and reproduce
 Kangaroo Rat	Strong legs, good hearing, and fast reflexes	Avoid being eaten

Organism	Adaptation	How it helps
 Collared Lizard	Active at night	Survive the climate and weather; avoid being eaten
 Prickly Pear Cactus	Instead of leaves, have pads with a thick covering	Survive the climate and weather
 Ball Cactus	Many spines to shade the body of the plant from the sun	Survive the climate and weather; avoid being eaten
 Bark Scorpion	Pincers and venomous sting	Avoid being eaten; get food
 Brittlebush	Grow fast and produces flowers right after rains	Reproduce; survive the climate and weather

Organism	Adaptation	How it helps
 Mohave Rattlesnake	Venom to kill prey	Get food
 Agave Plant	Waxy leaves to keep water inside	Survive the climate and weather
 Saguaro Cactus	Tasty fruit to attract animals to eat the fruit and move the seeds	Reproduction
 Shovel Snake	Shovel-shaped head to help "swim" through the sand	Avoid predators; get food

3. Choose one more animal or plant that you learned about in the **Mission Video** or in the **Mission Reader**. **Draw** a picture of the animal. Label at least three adaptations. Write a sentence next to each to **describe** how it helps the animal or plant.

Examples:



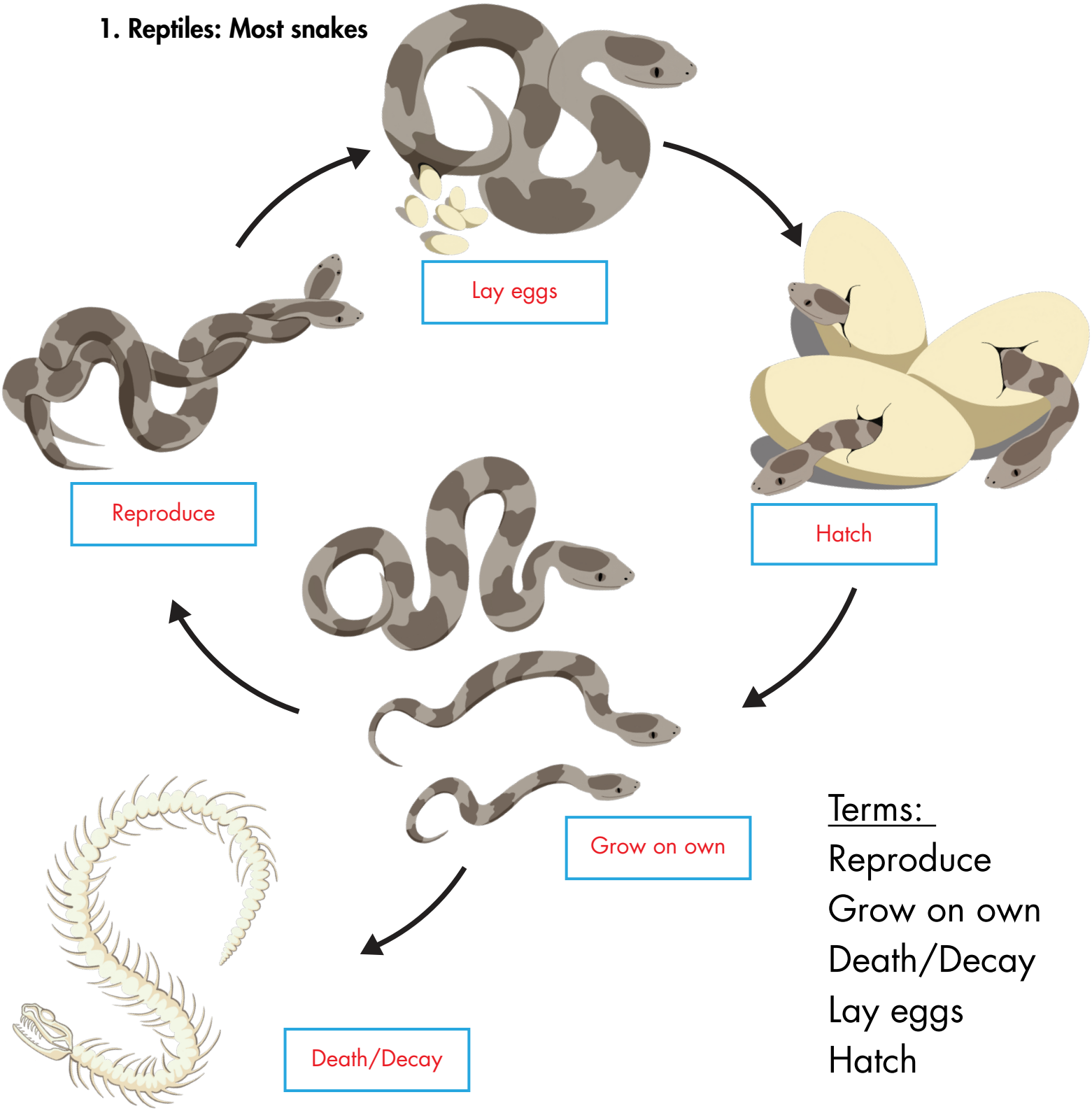
Kangaroo rat **Rattlesnake**

Extend the Lesson: Have students present their drawings and discuss the adaptations with the class. Alternatively, tell students to imagine many years in the future. Explain that people have found a new planet with life on it. The environment has a lot of rain and huge trees. Have them draw an imaginary animal and label some of the adaptations the animal has that helps it survive or reproduce.

Activity 2: Life Cycles

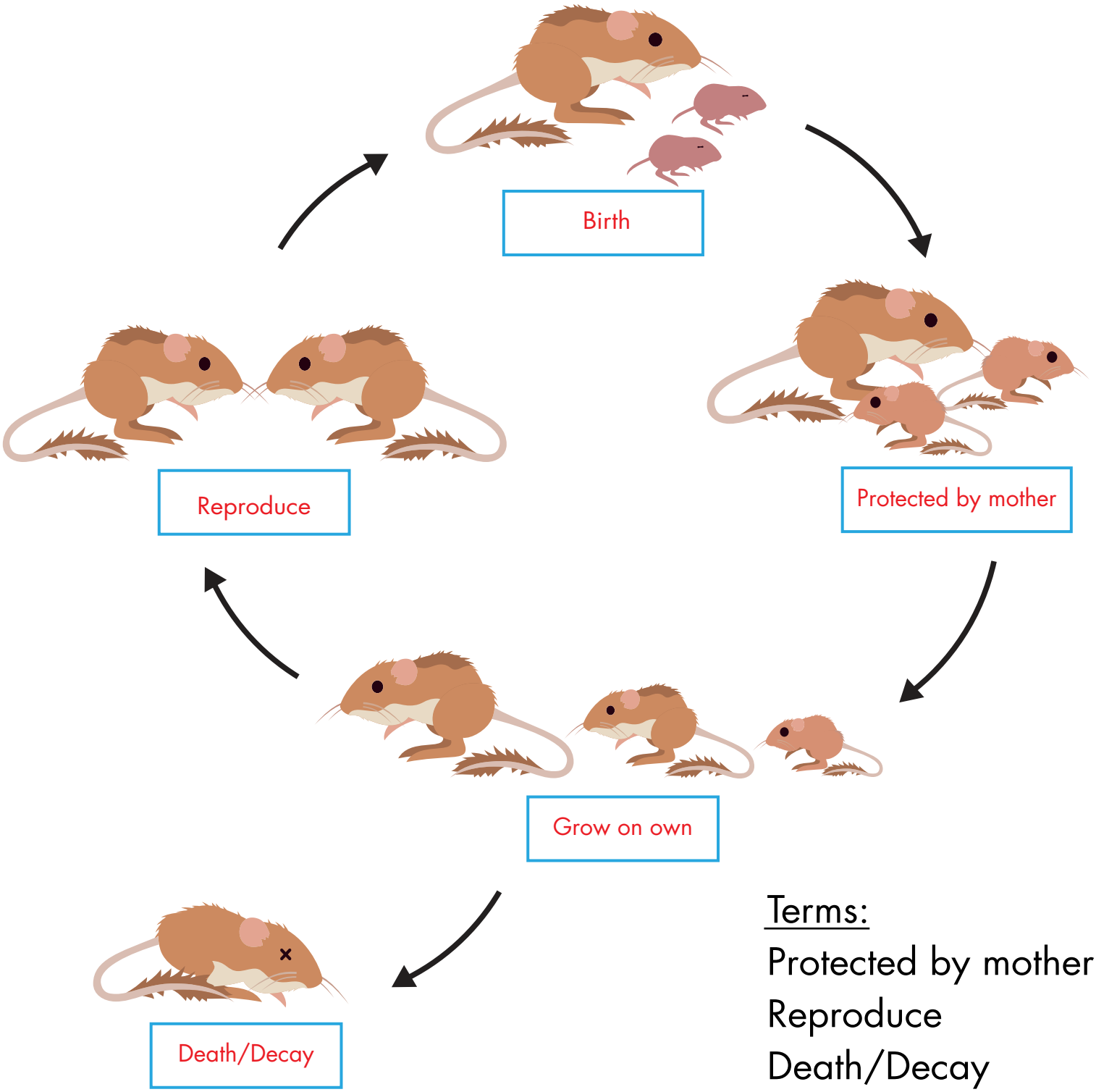
Reptiles, mammals, and plants have different life cycles. Use the list of words provided to fill in the boxes.

1. Reptiles: Most snakes



Terms:
Reproduce
Grow on own
Death/Decay
Lay eggs
Hatch

2. Mammals: Kangaroo rats



Terms:

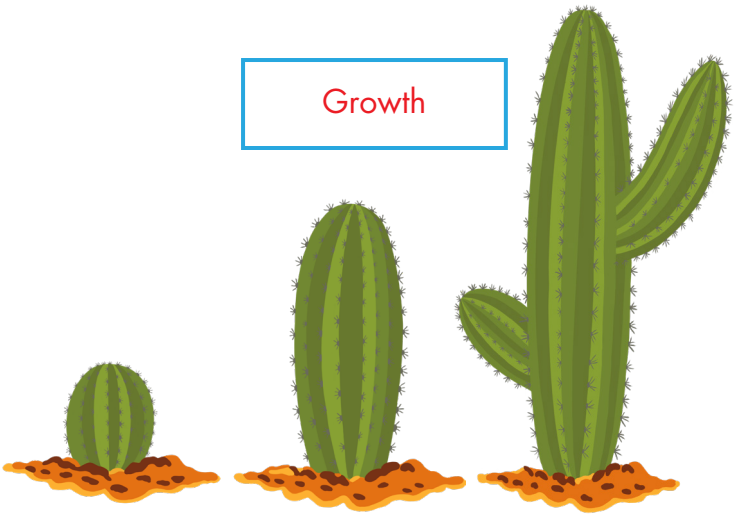
Protected by mother
Reproduce
Death/Decay
Birth
Grow on own

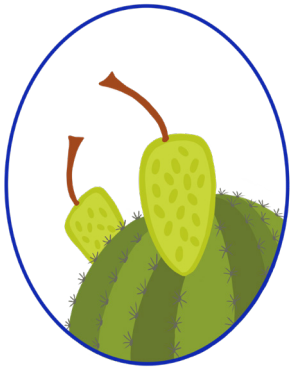
3. Plants: Saguaro cacti

Dispersal

Seeds

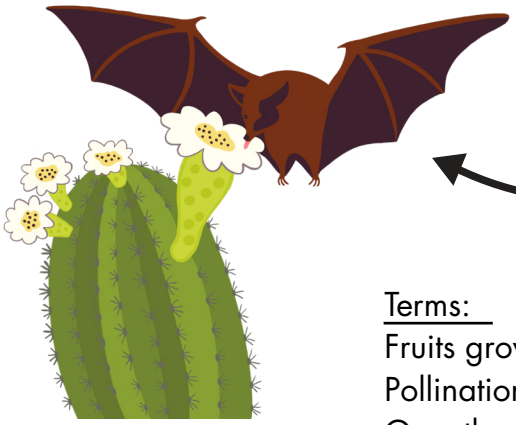
Growth



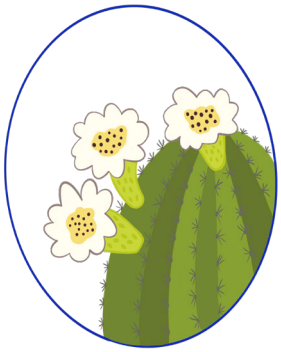


Fruits grow

Pollination



Flowers grow



Death/Decay

Terms:
Fruits grow
Pollination
Growth
Death/Decay
Dispersal
Seeds
Flowers grow

Activity 3: How Weather Affects Rattlesnakes

In order to catch a meal, a rattlesnake needs to be on the surface. It can't be under a rock or in a burrow. Dr. Howard Byrne has been following rattlesnakes near his house. He has recorded how much time they spend outside during the day in different seasons. Remember, rattlesnakes are cold blooded. That means their bodies are the same temperature as the air around them. If they are too cold, they can't be active. They can be more active when it is warmer. But, if it is too hot and too dry they might overheat.

Use Figure 1. below to answer the questions.

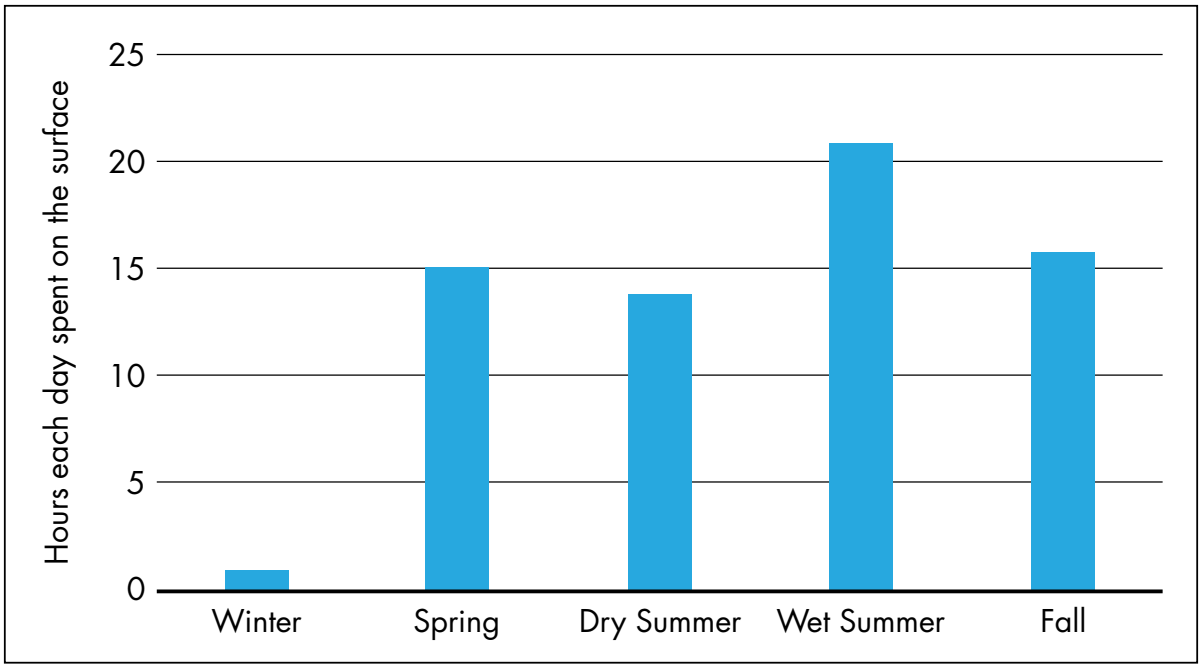


Figure 1. Number of hours each day that rattlesnakes spend on the surface where they might find food

1. **Describe** how the amount of time rattlesnakes spend on the surface changes from winter to spring, to wet summer, to fall.

   Rattlesnakes are not active very often in winter. Their activity is greater in spring and fall than winter. They are most active in wet summers.

2. Why do you think the amount of time snakes spend on the surface changes each season?

   Snake activity is higher when it is warmer and it is lower when it is colder. It is hottest in the summer and coldest in the winter. The temperature is in between in the spring and fall.

3. Why do you think that rattlesnakes spend different amounts of time on the surface in wet summers and dry summers?

   I think that rattlesnakes are less active in dry summers because they don't want to overheat or run out of water. When it is wet they can get enough water, so they can be more active.

   Extend the Lesson: Ask students to design an experiment to test their hypotheses. A sample idea includes "I would provide extra water to snakes during dry summers to see if they increase their activity level."

4. Do you think a change in weather during the summer would affect rattlesnakes? What would happen if there were large amounts of rain in the middle of a dry summer?

   I think that having more rain during a dry summer would let snakes be on the surface more. More time on the surface could mean more food.

5. What season is the safest for kangaroo rats that want to avoid rattlesnakes? Why?

   Winter is safest because the snakes are not very active.

Now that we know how much time snakes are on the surface at different times of year, let's explore when they actively seek prey. Kangaroo rats and the other rodents that rattlesnakes eat are nocturnal. That means they are active at night. Use Figure 2 to answer the next questions.

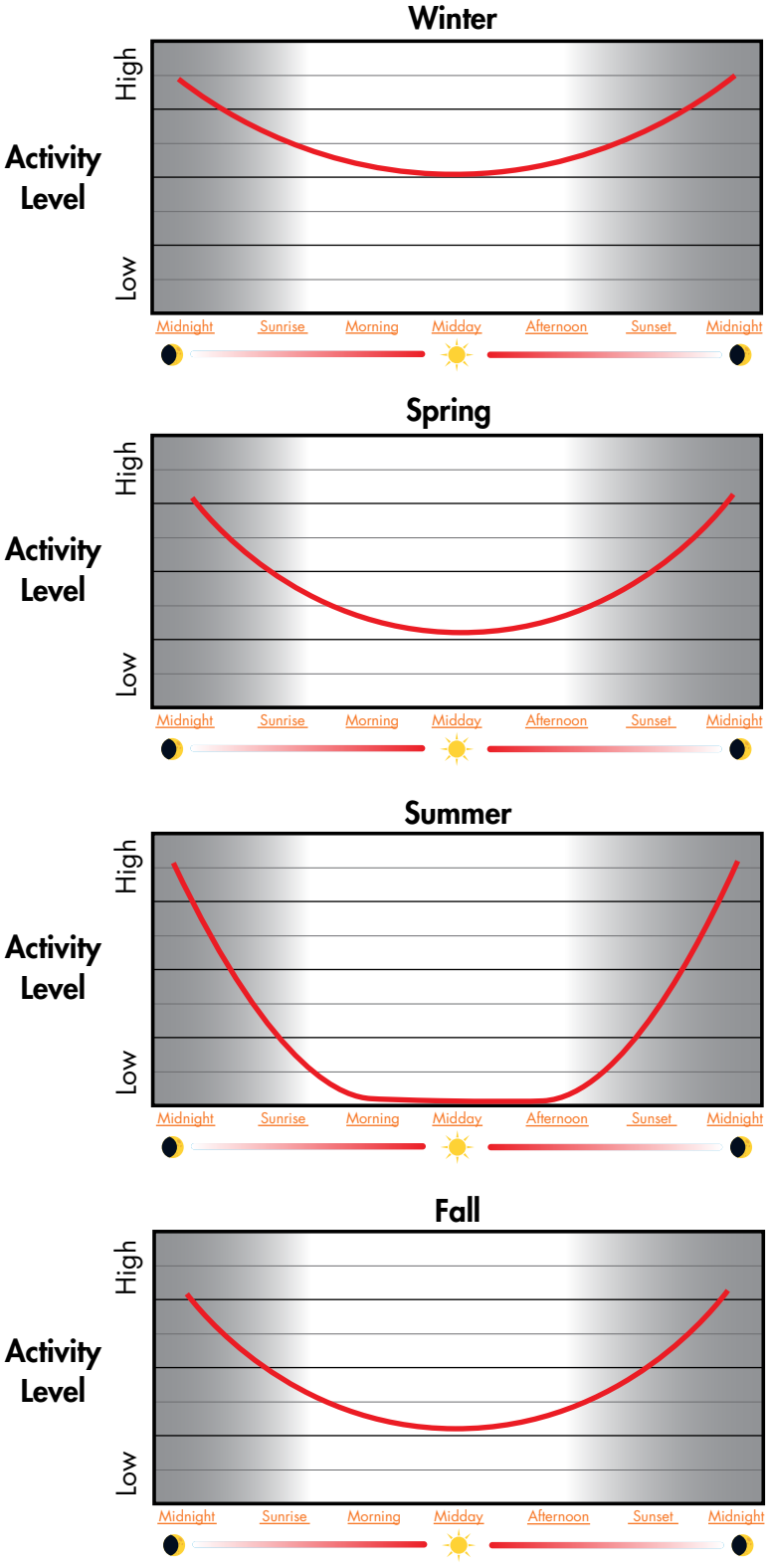


Figure 2. Activity levels in all four seasons for rattlesnakes

6. **Describe** when rattlesnakes are most active. Why do you think they have this behavior pattern?

   Rattlesnakes are not very active during the day. They are very active at night. This is probably because their prey are active at night and it is cooler.

7. Why do you think rattlesnakes behave differently in the summer than winter, spring, and fall?

   I think it is too hot for them to be active in the middle of the day in summer.