



# Lizard and Temperature Control

## Dashing from Sun to Shade

\*Location of activity provided by staff\*

**Grades:** (suggested) 4-8

**Subject:** Herpetology & Thermoregulation

### **Activity Objective:**

To have students learn about thermoregulation and keep their thermometer "lizards" alive by maintaining a five-degree temperature range as the lizards search for food.

### **Materials & Preparation:**

PROVIDED:

- 6 thermometer "lizards"
- 6 sets of wooden insects (6 insects per set)

NOT PROVIDED:

- Scratch paper & pencils
- Watch or way to keep time

**PREP:** Check the contents of the Lizard Temp box, if time (before the first group arrives) take a walk along the trail to familiarize yourself with the area.

**WEATHER:** This activity must be conducted on a very warm, sunny day. Winter is usually not conducive to this lesson.

Summary
Intro/ passing out materials: 5 mins
Activity: 15 mins
Conclusion/sharing: 5 mins



**Key Vocabulary Terms:** endotherms, ectotherms, temperature, degrees

### **Preparing Students at School:**

Students should practice reading a thermometer at school. The thermometers used in this activity show both the Celsius and Fahrenheit scales. You may use either, but this is an opportunity for students to become familiar with the Celsius measurement because it is used in scientific work.

### **Group Leaders On Trip Day:**

At the site, determine the area in which the activity is to take place. If the wash is being used, two lines may be drawn in the soil about 40-50 feet apart. The student must then stay within that boundary, but may place insects on the sides of the wash, but they must not climb on the sides of the wash. Similar lines may be drawn on a trail, but students must use the shade of plants along the trail and not go off into the desert.

### **Background Information:**

All animals must maintain body temperatures within certain temperature ranges to stay active and survive. Animals can be divided into two general groups according to the way they maintain their body temperatures.

Warm-blooded animals, called **endotherms** ( meaning “inside heat”) produce heat within their bodies, which allows them to maintain a fairly constant body temperature, regardless of outside temperatures. Mammals (including humans) and birds are endotherms.

All other animals (reptiles, amphibians, fish, insects, etc.) obtain most of their heat from the environment. These are **ectotherms** (“outside heat”). Many ectotherms regulate their body temperatures by moving into warmer or cooler spots in their environment. Lizards and snakes, for example, alternate between basking in the sun and resting in the shade to keep their body temperatures within the range that permits them to stay active. Ectotherms can

also regulate their body temperature by burrowing and by varying the angle of their exposure to the sun.

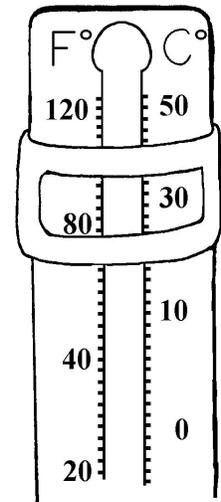
**Intro/ Passing Out Materials:** (about 5 mins)

Arrange the students in teams of two and give each team a thermometer lizard. (give instructions on reading a thermometer)

Ask each team to go find the highest and lowest temperatures in the activity site.

After about 5 minutes, call the group back together- add the highest temperature to the lowest temperature and divide by two for an average.

Instruct the teams to slide the “windows” on their thermometers so that the center of the window is located at the average temperature. This gives a “window” of 5 degrees.... This is how the window would look if the average temperature was 30 degrees C --->



**Review the following information with the group:**

Humans, other mammals, and birds produce heat inside their bodies and have a steady temperature regardless of outside temperatures. If our body temperatures go up or down, even a few degrees from normal, we can become very ill or die. All other animals, including reptiles, amphibians, fish, insects, etc. get most of their body heat from their surroundings. Today we are going to think about lizards, which are reptiles. On hot days, or while in the sun, a lizard’s body temperature goes up. On cool days, or while in the shade, the lizard’s body temperature goes down.

Pass out a set of insects to each team. ( the color of the set should match the color of the lizard)

**Activity:** (15 mins)

Each team will place its lizard’s food (the wooden insects) in various places within the activity area- in the sun, in the shade, in partial shade. (allow the teams a few minutes to place their insects around the area and then begin the game)

The teams have about 15 minutes to move their lizards around as they look for their insects. The lizard can eat only one insect every 2 minutes. Each team watches the thermometer window at all times to be sure the lizard does not get too hot or cold. (the top of the red mark should always be visible in the window)

If the temperature is going too low, the lizard must warm up in the sun. If it is going too high, the lizard must cool down in the shade. (\* the students MAY NOT use their own bodies as shade for the lizards\*)

When the leader calls out “**INSECT**” the teams move their lizards along the ground to the first insect. The insect is gathered up and each team decides where the lizard will rest as it digests its food. (The lizard may move during this time if the temperature is going too high or too low).

After two minutes the leader calls out “**INSECT**” again, and the process is repeated.

After all insects have been “eaten”, the students gather together with the leader and discuss their lizards’ search for food.

### **Conclusion:** (about 5 mins)

Discussion questions:

*Were you able to keep your lizard within the safe range?*

*Did any lizards’ heat or cool too much? If so, what might have happened to your lizard?*

*Did your lizard have to do a lot of scurrying around to survive?*

*What seemed to be the ideal type of place for the lizard to maintain its body temp?*

### **Clean Up:**

After the last group, COLLECT ALL THE INSECTS from each team. 6 sets of insects (6 per set). Collect the 6 thermometer lizards. Place all materials in the box and return to “Biznaga” building.

