



SCIENCE IN THE FIELD: USING GPS TAGGING LESSON PLAN

This section explains how the Galapagos tortoises have adapted to their environment, how and why tortoises are tracked and the importance of analysing results. It also reviews the Galapagos Tortoise Monitoring Ecology Project (GTMEP) and how modern research technologies can provide vital information for conservation strategies.

Resources required: Tortoise tracking presentation and the tortoise tracker template, internet access.

1. FIRE STARTER

Introduce the [Tortoise Tracking presentation](#). It begins with an introduction to the different habits in Galapagos and how the giant tortoises have adapted to their habitat. On the slide with two tortoises with very different shells, ask the students to think about what the main differences are between the tortoises and why such differences may be advantageous in different habitats. By the end of the presentation the students should know that tortoises can live in lush, arid or muddy habitats as long as they are adapted to that environment. Emphasise that no matter what their habitat is, all tortoises need to find a sandy environment in which to lay their eggs.

2. GAINING GROUND

In the second part, look at how Galapagos scientists gather and recording information about Galapagos giant tortoises using tracking devices. Start by telling the students that the tracking devices are attached to the tortoises' backs using a strong glue and contain the following: A GPS unit (like in a satellite navigation system) to track the tortoises movements, an accelerometer to measure movement speed, a memory chip to store data, a radio beacon to enable radio-tracking, and a wireless communications device with which to upload the stored data to a handheld 'base station'.

As a class or in groups, ask the students why scientists might want to know this information about the tortoises and discuss how the information could be used to stop a species from becoming endangered or extinct. Ask the students if they can think of any other factors that a scientist might be able to measure, how they would accomplish this and why it would be important to do so.

3. MAKING WAVES

After the students have thought about what scientists might want to find out about tortoises, ask them to design their own tortoise tracker. Using the [tortoise tracker template](#) draw a tracking device and add on extras that would help measure the other attributes they thought of during the discussion; for example, a thermometer if they wish to measure environmental temperature, or a pedometer to measure their steps.

4. FUTURE FOCUS

Get students to share and explain their designs. Now link their work to the GTMEP and how modern research technologies are helping the Galapagos scientists to learn more about the species in order to design successful conservation programmes.

Watch this video about the impact of human population growth on tortoise populations and migrations [here](#).

LEARNING OBJECTIVES

- To understand how tortoises are tracked in Galapagos and why it is important we gather this information.
- To understand how scientific evidence can help us answer key questions.
- To learn about modern science techniques, including the use of GPS tagging.

STUDENTS' OUTCOMES

- To explain the key questions that require investigation to aid the conservation of the Galapagos giant tortoise.
- To explain how scientific investigation is important in managing the conservation of a species.
- To discuss how GPS data can be used in modern science research.

KEY VOCABULARY

habitat, adapted, environment, GPS tagging, GPS tracking, migration, impact, endangered, extinct