



## Education and Research: Testing Hypotheses

# Lesson Plan—Student Tracking

### Summary

This activity allows students to become familiar with satellite tracking procedures, relevant questions, data sources and organization. Students will use various tracking techniques to find out where they go on a daily basis, what the environmental conditions are where they are traveling and what activities they are participating in during their “migrations.” Scientists who study organisms such as pelagic predators in the wild are unable to talk with their target organisms, and must find alternate means of obtaining information. This activity will help students understand why satellite tracking is useful and how it works.

### Key Concepts

- Science and technology are closely linked when organisms under investigation are not easily accessible to scientists

### Objectives

Students will be able to:

- **Describe** different methods used by scientists to carry out pelagic research

### Materials

- Science journal for each student
- Student Tracking sheet
- School or community maps (optional)

### Procedure

1. Discuss different research methods that might be applicable to tracking students. Include information on the use of consumer technology, including cell phones or PDAs.
  - There is a tracking program available for download from CyberTracker (<http://www.cybertracker.co.za/>) that can be used in conjunction with Palm OS PDAs to enhance the experience for students with access to Palm technology
2. Divide the class into partner pairs and have each student “track” their partner (or themselves) for one day (24-hour day or school day), using any method identified in the previous discussion. Decide what information is necessary or interesting to record on their *Student Tracking sheet*. Encourage students to consider the following factors:
  - **Time/Location**
    - How often should readings be taken?
    - How should students record location (Latitude/Longitude vs. site description)?
    - How specific should readings be?

- **Environmental conditions**
    - How can temperature be measured/recorded/described?
    - What are the light conditions (natural or artificial)?
    - How can light be measured/recorded/described?
    - What are the audio conditions (quiet, talking, music, TV, natural, etc.)?
    - How can noise level be measured/recorded/described?
    - How can air quality be measured/recorded/described?
  - **Behaviors**
    - *Feeding*
      - What is being eaten? Where did it come from? How is it consumed? How much was eaten? How long does a meal take? How often does feeding occur?
    - *Resting*
      - What conditions are optimal for resting? How long does each period of rest last?
    - *Social interaction*
      - What is the usual group size during interactions? What is the gender mix? What behaviors are exhibited during interactions?
3. Discuss what types of units students will encounter during this study. Discuss the problems with using different measurement methods and the importance of assigning units and displaying them with data.
  4. Have students create a tracking map using a previously prepared school or community map, or have them create their own graphic representation of their data. Have students prepare both a scientific listing and a descriptive account of their tracking data.
  5. Arrange partner pairs in small groups and have students discuss the difficulties they encountered, innovations they came up with and data they collected or were unable to collect during the activity.
  6. Discuss what obstacles scientists might encounter in studying pelagic predators. How have they solved some of these problems? How has technology increased their ability to collect information about these far-ranging open-ocean animals?

### Assessment

- **Performance**—Did student participate in discussion sessions and demonstrate an understanding of the procedures, benefits and limitations of remote tracking?
- **Product**—Did student accurately record tracking information and provide an appropriate descriptive account? Was student able to transfer tracking information to graphic format using a map or diagram?

