RESEARCH IN ACTION

INQUIRING MINDS AT ZOO ATLANTA

With hundreds of animals residing at Zoo Atlanta, ensuring their health and wellbeing is our top priority. From frogs and flamingos to elephants and otters, Zoo Atlanta has a specialized team of animal care professionals, veterinarians, nutritionists, and animal welfare scientists who look after each individual in our care. Animal wellbeing is the combined physical, mental, and emotional state of an animal over a period of time that can be measured in a variety of ways. At Zoo Atlanta, we have a team of animal welfare scientists who partner closely with animal care professionals and make recommendations to provide the best and most dynamic environments for the animals.

Animal welfare scientists utilize the scientific method to propose questions, make a hypothesis, and then set out to answer those questions using data. This important standardized approach helps to answer questions about each of the animals' wellbeing.

Follow the scientific inquiry process below to learn how animal welfare scientists use data to understand the science of animal behavior, cognition, and emotions, and how they apply what is learned to make decisions for the wellbeing of the animals at Zoo Atlanta.

1. RESEARCH QUESTION

All inquiries start with observations and questions. Humans are natural observers of the world around us. We observe other people in order to make friends in class, or to watch out for safety clues when crossing the street. Observations about the world are often followed by questions. At home, you may observe your dog barking and ask why he barks at the mail carrier every day. At the Zoo, you might observe lion brothers playing and wonder, do lions feel affection for their siblings? Animal welfare scientists have the important job of finding answers to questions about animal behavior. The goal of our research is to understand animal behavior to help animals live their best lives.

EXAMPLE QUESTION: Do lions feel affection for their siblings?

2. HYPOTHESIS

A hypothesis, or an educated guess about what will happen, is the starting point of all studies and is formed by asking questions. Before a hypothesis can be formed, an animal welfare scientist must have knowledge about the species being studied. Scientists try to find out more about the individual animal. Whenever possible, it helps to have information about the individual subject being studied. Using all available information, hypotheses can be formed. Once formed, the scientist then sets out to test their hypothesis.

An animal welfare scientist observing a fossa moving repetitively along the edge of his habitat may ask, "How much repetitive movement is normal for predators?" After gathering data from fossas at other zoos, or information about fossas in the wild, the scientist may want to find out if there is a relationship between repetitive movement and other factors.

EXAMPLE HYPOTHESIS: Increasing the number of feedings during the day for a fossa will reduce the amount of repetitive movement overall. This hypothesis is based on our knowledge that fossas can travel up to 16 miles a day in the wild to find food.

3. TEST DESIGN

Create a test with the ability to measure change to prove or disprove your hypothesis. Changing animal groupings, rearranging a habitat, allowing animals to make choices or providing puzzle feeders are examples of variables that may be tested as a change in the environment. It is important that the tests can be replicated over time to see if the results happen more than once.

EXAMPLE OF TEST DESIGN: One test, based on human studies, has been shown to reveal an animal's state of mind. We taught ambassador parrots to perform one behavior when they see a black card and another for white cards. The parrots are then shown cards in shades of grey, and their response is recorded and later analyzed. Animal welfare scientists are interested to know how they react to the ambiguous grey card – do they associate it with the black or white card, and what behavior are they seeking to perform? How do they make decisions when the information is ambiguous? Tests like these can teach us how animals use their minds to make choices in their daily lives.

4. TEST, OBSERVE, RECORD

With the test in place, observations begin again, and data are collected. The test may involve one subject, certain members, or the entire group. Some examples of possible data could include physical measurements, like food intake, amount of time walking, or behavior. The scientist will observe the animal's activities and compare the data to the observations taken before the test started.

EXAMPLE OF RECORDING DATA: Animal welfare scientists record data on a tablet as they observe animal behavior. The data are often recorded at different times of day, and depending upon how long the study is, during different seasons.

5. DATA ANALYSIS

Once data have been collected, the team must try to make sense of their findings. Data are checked for mistakes, arranged carefully, and analyzed. Animal welfare scientists may look for patterns in behavior, social interactions, or where animals spend their time, among other things related to the hypotheses and research questions. Analyzing and interpreting data is one of the most important steps in the welfare process as it will help inform future decisions about the individuals in our care.

EXAMPLE DATA ANALYSIS: Naked mole rat behavior data were collected before, during and after adding red light to their habitat, and were then analyzed to determine the impact of the change on the naked mole rats.

6. COMMUNICATE

Once the data are analyzed, animal welfare scientists will share their results with the animal care specialists and, if needed, they will work together to increase animal wellbeing. This information can also be shared across organizations to ensure that the best possible care is provided to animals within zoological settings.

EXAMPLE OF COMMUNICATION: A naked mole rat study showed that individuals within the colony were not affected by red light or white light, providing valuable information in the management of a species that lives underground in deep tunnels in the wild. A good next step would be to test whether they prefer darkness to the white and red lights.
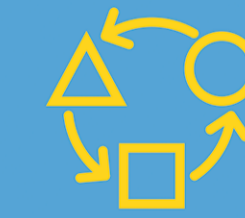
7. REFLECT & ADAPT

Research leads to many different outcomes. After any study is completed, scientists reflect on the process. Sometimes a study will reveal new questions, and the process starts over, leading to further explorations intended to learn more about that species or individual.

EXAMPLE OF REFLECTION: In the case of the fossa, studies revealed that certain types of feedings decreased his repetitive movement around the habitat. Next up is to study if altering his habitat more regularly will also decrease his repetitive movement.

ANIMAL WELLBEING AT ZOO ATLANTA

Every individual has different needs to achieve optimal wellbeing. Zoo Atlanta is fortunate to have a dedicated team of animal care professionals, in addition to animal welfare scientists, who aim for optimal wellbeing for each animal in our care. The Animal Welfare Team, headed by Director of Animal Welfare Dr. Marieke Cassia Gartner, includes Alexz Allen, Research Assistant, and Postdoctoral Fellow Dr. Eridia Pacheco.

Next time you are at the Zoo, look for Zoo team members collecting data, making observations, or generally caring for the animals. There are a number of STEAM careers at Zoo Atlanta that help support animal welfare, conservation, research, and education. It's also important to practice your observation skills, ask questions, do your own research, and communicate what you are wondering.

To learn more about animal care and wellbeing, visit the Association of Zoos and Aquariums (AZA) for more information: www.aza.org/animal-care-management.

FREE CURRICULAR CONNECTIONS!

ZOOATLANTA.ORG/LEARN | 404.624.5822 | EDUCATION@ZOOATLANTA.ORG