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**DeSoto National Wildlife Refuge**

## Part I: Overview of Refuge

DeSoto National Wildlife Refuge is located in the migratory bird corridor of the Missouri River floodplain and provides essential habitat for resident, migratory, and endangered species. DeSoto National Wildlife Refuge is also home to an archeological collection of over 250,000 artifacts excavated from the buried wreck of the Steamboat Bertrand. Using historical documents and a flux gate magnetometer, Sam Corbino and Jesse Pursell located the wreck in 1968. As the boat was on federal property, Corbino and Pursell agreed under the requirements of the American Antiquities Preservation Act of 1906, to turn over all recovered artifacts to the U.S. Fish and Wildlife Service for permanent exhibition and preservation in a public museum. By 1969, the vessel's cargo was completely excavated. The Bertrand's cargo was remarkably well preserved and the refuge's collection is a unique time capsule for researchers and visitors interested in America's 19th century material culture.

## Part II: Job Specifics

The job of both the museum specialist and curator at DeSoto National Wildlife Refuge is to ensure the preservation, restoration, and conservation of the entire Bertrand Collection to the best of their abilities. To carry out this task, the museum specialist and the curator used techniques from both the social and natural sciences. Additionally, collaboration between the refuge staff, social scientists, natural scientists, educators, and other specialists are essential to determining the best methods for ensuring the historical validity of each object.

## Part III: Introduce the Problem

The Bertrand Collection consists of around a quarter of a million artifacts. These artifacts are of various materials including glass, wood, metal, wax, and other organic and inorganic materials. In order to ensure the historical validity and conservation of an artifact, each must be kept at specific environmental conditions. Although ideally every object would be at its optimal conditions, this practice is cost-prohibitive. The student's task will be to determine the best possible environmental conditions and control for the entire Bertrand Collection while considering cost and the nature of the Collection.

## Part IV: Background

Students should have a background knowledge of chemical and physical properties. Additionally, students should understand the differences between physical and chemical changes. Through the analysis of the physical and chemical properties, students should be able to determine the environmental conditions necessary to preserve each type of artifact effectively. Furthermore, students should be able to conduct independent research using online databases.

## Part V: Refuge Solution

The refuge determined the optimum light, temperature, humidity conditions for each type of artifact material. These values were then averaged together to determine the mean condition most appropriate for the entire collection. The above listed environmental conditions are controlled through an HVAC computer system.

## Part VI: Student Solutions

Students may choose to change the system used by the museum. Students may also choose the same type of method used by DeSoto. Additionally, students might choose to hold each variable the "highest" optimum.