



Sea Lions and the One Health Paradigm (Teacher Copy)

Sea Lion Feeding Frenzy

Teachers: for middle school level, you may want to read this to students or together as a class. The reading level is slightly high for most middle schoolers.

Directions: Read the information in the document and answer the questions that follow.

Introduction: Environmental changes and rapid human development (e.g. climate change, landscape alteration and destruction, pollution) alter the way in which humans, animals, and the environment interact. For example, as the climate becomes warmer, some species (like mosquitos) that did not previously live in colder areas are able to move into newly warming areas and bring the diseases they carry with them to cause new outbreaks. To best understand this complicated picture, experts need to learn better ways to communicate and work together to rapidly respond and devise prevention strategies in order to minimize disease in humans and animals.

One Health: The one health paradigm is the interface of humans, animals, and the environment. The goal of one health is to achieve optimal health outcomes while recognizing the interconnection of people, animals, and our shared environment. This is a local, regional, national, and global initiative which is not limited to one particular area of study. Almost any research group can contribute to the common goal of one health. One Health is not new, but it has become more important in recent years because many factors have changed the interactions between people, animals, and our environment. These changes have led to the spread of existing or known and new or emerging zoonotic diseases, which are diseases that can spread between animals and people. Animals also share our susceptibility to some diseases and environmental hazards. Because of this, they can sometimes serve as early warning signs of potential human illness. One Health issues include zoonotic diseases, antimicrobial resistance, food safety, vector-borne diseases, environmental contamination, and other health threats shared by people, animals, and the environment. Successful public health interventions require the cooperation of human, animal, and environmental health partners. No one person, organization, or sector can address issues at the animal-human-environment interface alone.

One Health is the idea that the health of people is connected to the health of animals and our shared environment.



When we protect **one**,
we help protect **all**.

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Sea Lions as Sentinels: Marine mammals are considered sentinel species in marine ecosystems around the world. Sea lions are considered to be prime sentinels because they have long life spans, are long-term coastal residents, feed at high trophic levels, and have unique fat stores that serve as depots for anthropogenic toxicants. Sea lions may be exposed to environmental stressors such as chemical pollutants, harmful algal biotoxins, and emerging or resurging pathogens. Since many marine mammal species share the coastal environment with humans and consume the same food, they also serve as effective sentinels for public health problems. After centuries of exploitation and declines in populations of marine mammals the Marine Mammal Protection Act was established in 1972 which provided protection for all marine mammals in United States Waters. The growth of pinniped populations has been steadily increasing since then.

Questions: Teachers - you can use these as discussion questions, or use the student copy for students to complete on their own.

1. What factors do you think have changed the interaction between people, animals, and our environment and have led to an increase in disease transmission?

Answers include: Human populations are growing and expanding into new geographic areas. More people live in close contact with wild and domestic animals. Animals play an important role in our lives, whether for food, fiber, livelihoods, travel, sport, education, or companionship. Close contact with animals and their environments provides more opportunities for diseases to pass between animals and people.

The earth has experienced changes in climate and land use, such as deforestation and intensive farming practices. Disruptions in environmental conditions and habitats can provide new opportunities for diseases to pass to animals.

The movement of people, animals, and animal products has increased from international travel and trade. As a result, diseases can spread quickly across borders and around the globe.

2. List 3 different characteristics humans and other animals share.

Answers include: Sensory organs, cell structure, diet, contaminant exposure, diseases susceptibility, etc.

3. Why was the Marine Mammal Protection Act Created?

Answer: The MMPA was passed when the public expressed serious concerns over the welfare of certain species. Seals were being hunted for their fur, thousands of dolphins were dying each year as incidental tuna fishery bycatch casualties, and whales were still being harvested commercially. The very real fear of human activities causing the depletion or even extinction of these species and others sparked high alarm for change in the halls of Congress.

4. Why do scientists work in teams?

Answer: Very open-ended question. One possible answer is collaboration is a big part of the scientific field. Many scientists have many different talents and can bring their certain expertise to the table to get unique results from a variety of projects.