

HEARING HOMEWORK

The following events occur when you hear, however, the events are out of order. Write a number before each item to indicate the correct sequence.

- _____ Sound waves strike the eardrum, causing it to vibrate
- _____ Vibrations are channeled into the cochlea
- _____ Sound waves move through the ear canal
- _____ Vibrations are passed to the anvil
- _____ The brain interprets electrical impulses as sound
- _____ Vibrations enter the middle ear
- _____ Sound waves enter the outer ear
- _____ Vibrations are transmitted to the stirrup
- _____ Electrical impulses are transmitted to the brain
- _____ A vibrating membrane transmits vibrations to the inner ear
- _____ Nerve cells detect vibrations and convert them to electrical impulses
- _____ The hammer picks up the vibrations

Range of Hearing

Humans can hear sounds with frequencies as low as 20 Hz. Sound waves with frequencies below this limit are called infrasonic. Low-frequency sounds carry over longer distances than higher-frequency sounds do.

Elephants can hear sounds at infrasonic frequencies. Some zoologists believe that elephants can hear approaching thunderstorms. Thunderstorms contain rapidly moving columns of air. These air columns produce infrasonic waves that elephants can hear over great distances, while the storm is still many kilometers away.

Birds can also hear very low-frequency sounds. They may be able to find pickets of rising air by listening for the infrasonic waves that moving air columns produce.

Elephants and hippopotamuses not only hear infrasound, they can also produce it. Both kinds of animals communicate with distant member of their own herd and those of other herds several kilometers away by making sounds at infrasonic frequencies.

Animal	Lowest frequency heard (Hz)	Highest frequency heard (Hz)
Humans	20	20,000
Cats	100	65,000
Dogs	40	50,000
Horses	31	40,000
Elephants	16	12,000
Cattle	16	40,000
Bats	1,000	120,000
Whales & dolphins	70	150,000

Answer the following questions in the space provided.

1. Which animals in the table can hear sounds at infrasonic frequencies?
2. Sound waves above the limit of human hearing are called ultrasonic. Which animals in the table can hear sounds at ultrasonic frequencies?
3. Waterfalls also produce infrasonic waves. Why would it be helpful for animals to be able to detect them?
4. Why do you think cattle's ability to hear infrasonic frequencies might contribute to a stampede?