Directions: Combine the word parts below to form the answers to the clues below. Work carefully. A space has been left between each word part to help you. Place one letter on each blank, and be sure the number of letters in each word part matches the number of blanks. Cross out each word part as you use it. The first definition has been started for you to use as an example.

1. effect produced when a musical instrument vibrates
   ____ ____ o __________
   res o

2. rely on vibration of air to make music (3 words)
   __________ __________
   __________ ___

3. rise and fall in sound intensity
   __________
   __________

4. causes music and noise
   __________
   __________

5. sound that has random patterns and pitches
   __________
   __________

6. describes the difference between two sounds having the same pitch and loudness
   __________
   __________

7. violins, guitars, and harps
   __________
   __________

8. main tone produced when an entire string vibrates up and down (2 words)
   __________
   __________

9. sounds that deliberately follow a regular pattern
   __________
   __________

10. drums and xylophone
    __________
    __________

11. produced by vibrations that are multiples of the fundamental frequency
    __________
    __________

12. hollow chamber that amplifies sound when the air in it vibrates
    __________
    __________
I. Testing Concepts

**Directions:** Fill in the blanks to complete the sentences.

1. Sound travels faster through ________________ and liquids than through ________________ because the individual molecules are ________________ together.

2. When you turn down the volume on the television, you reduce the ________________ carried by the sound waves, so you also reduce their ________________.

3. Sounds above ________________ dB may cause pain and permanent hearing loss.

4. As the frequency of a sound wave decreases, the pitch becomes ________________.

5. When two instruments play at the same time, the sound waves produced by each instrument ________________.

6. Sound frequencies are measured in ________________.

**Directions:** Determine whether the statements below are true or false. If a statement is false, change the underlined term to make it true.

7. The distance to an object can be calculated by measuring how much time passes between emitting the sound pulse and receiving the reflected signal.

8. Sustained sounds above 50 dB can cause permanent hearing loss.

9. Each string on a guitar has a different set of natural frequencies.

10. An instrument vibrates at many different frequencies at once, causing you to hear multiple notes.
II. Understanding Concepts

Skill: Sequencing

Directions: Number the sentences in order to show how sonar can be used to locate objects underwater.

1. The distance to the object is calculated by measuring how much time passes between emitting the sound pulse and receiving the reflected signal.

2. A sound pulse is emitted toward the bottom of the ocean.

3. A sensitive underwater microphone picks up the reflected signal.

4. The sound travels through the water and is reflected when it hits something solid.

Skill: Categorizing

Directions: Write an X next to each use of sound waves.

5. remove dirt from jewelry

6. give images of a fetus

7. tell astronauts the distance to an asteroid

8. map the surface of the ocean floor

9. break kidney stones into small pieces

10. locate schools of fish

Directions: Categorize each instrument as a percussion, wind, or string instrument.

11. electric guitar

12. flute

13. cymbal

14. harp

15. kettle drum

16. trumpet

Skill: Interpreting Scientific Illustrations

Directions: Write the answer in the space provided.

17. You see a diagram of waves with tight, dense compression. Describe the type of sound associated with these waves.

18. You see a diagram of high-frequency sound waves with close compressions and rarefactions. Describe the pitch.
Directions: Use the clues below to complete the crossword puzzle.

Across
2. Echoing effect produced by many reflections of sound
4. A kind of percussion instrument
6. Sometimes used to examine parts of the body
7. The study of sound
9. Describes the differences among sounds of the same pitch and loudness
10. A hollow chamber filled with air that amplifies sound when its air vibrates

Down
1. A vibration whose frequency is a multiple of the fundamental frequency
3. The process of locating objects by emitting sounds and interpreting the sound waves that are reflected back
5. Created when specific pitches and sound qualities are used deliberately in a set pattern
8. System that uses the reflection of underwater sound waves to detect objects.