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Crash Course Physics #19: The Physics of Music

Name: _____ Date: _____

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1. A _____ wave appears to stay still, with only its amplitude changing.
2. Standing waves are created through the processes of _____ and interference.
3. The points on a standing wave that do not move are called _____.
4. The points on a standing wave where the wave reaches maximum displacement are called _____.
5. A string with two fixed ends always has a _____ at each end.
6. The simplest form of a standing wave is called the _____ or first harmonic.
7. Each additional harmonic adds one _____ and one _____ to the wave.
8. The combination of the fundamental and the overtones creates the full set of _____.
9. For a string with two fixed ends, the length of the string equals _____ the wavelength of the fundamental.
10. The frequency of a wave is equal to its velocity divided by its _____.
11. In a pipe with two open ends, each end acts as an _____ of the wave.
12. A pipe that is closed on one end and open on the other only supports odd-numbered numbered _____.
13. The wave in a pipe with one closed end and one open end spans _____ of a wavelength in its fundamental.
14. Musical instruments sound different from each other due to the differing _____ of their harmonics.
15. The equations for wavelength and frequency are the same for pipes with two open ends and strings with two _____ ends.

Crash Course Physics #19: The Physics of Music KEY

1. A **standing** wave appears to stay still, with only its amplitude changing.
2. Standing waves are created through the processes of **reflection** and interference.
3. The points on a standing wave that do not move are called **nodes**.
4. The points on a standing wave where the wave reaches maximum displacement are called **antinodes**.
5. A string with two fixed ends always has a **node** at each end.
6. The simplest form of a standing wave is called the **fundamental** or first harmonic.
7. Each additional harmonic adds one **node** and one **antinode** to the wave.
8. The combination of the fundamental and the overtones creates the full set of **harmonics**.
9. For a string with two fixed ends, the length of the string equals **half** the wavelength of the fundamental.
10. The frequency of a wave is equal to its velocity divided by its **wavelength**.
11. In a pipe with two open ends, each end acts as an **antinode** of the wave.
12. A pipe that is closed on one end and open on the other only supports odd-numbered **harmonics**.
13. The wave in a pipe with one closed end and one open end spans **one-quarter** of a wavelength in its fundamental.
14. Musical instruments sound different from each other due to the differing **amplitudes** of their harmonics.
15. The equations for wavelength and frequency are the same for pipes with two open ends and strings with two **fixed** ends.

15 Questions

Answer Key Included

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