

Name \_\_\_\_\_

## Cosmic Ripples: Exploring the Universe with Gravitational Waves

### Short Answer Key

1. The direct detection of gravitational waves confirmed a major scientific theory, Einstein's theory of general relativity, which predicted the existence of these waves.
2. LIGO detects gravitational waves by using laser beams in long tunnels to measure tiny changes in tunnel length caused by passing waves.
3. Neutron star collisions are significant because they produce heavy elements and gravitational waves help in their study by providing information about the events' characteristics.
4. Gravitational waves can be used to observe events like black hole mergers that do not emit light, making them visible through this new method.
5. Gravitational waves can be used to measure cosmic distances by comparing the observed and expected waveforms. They contribute to understanding the universe's expansion rate by refining its measurement.

