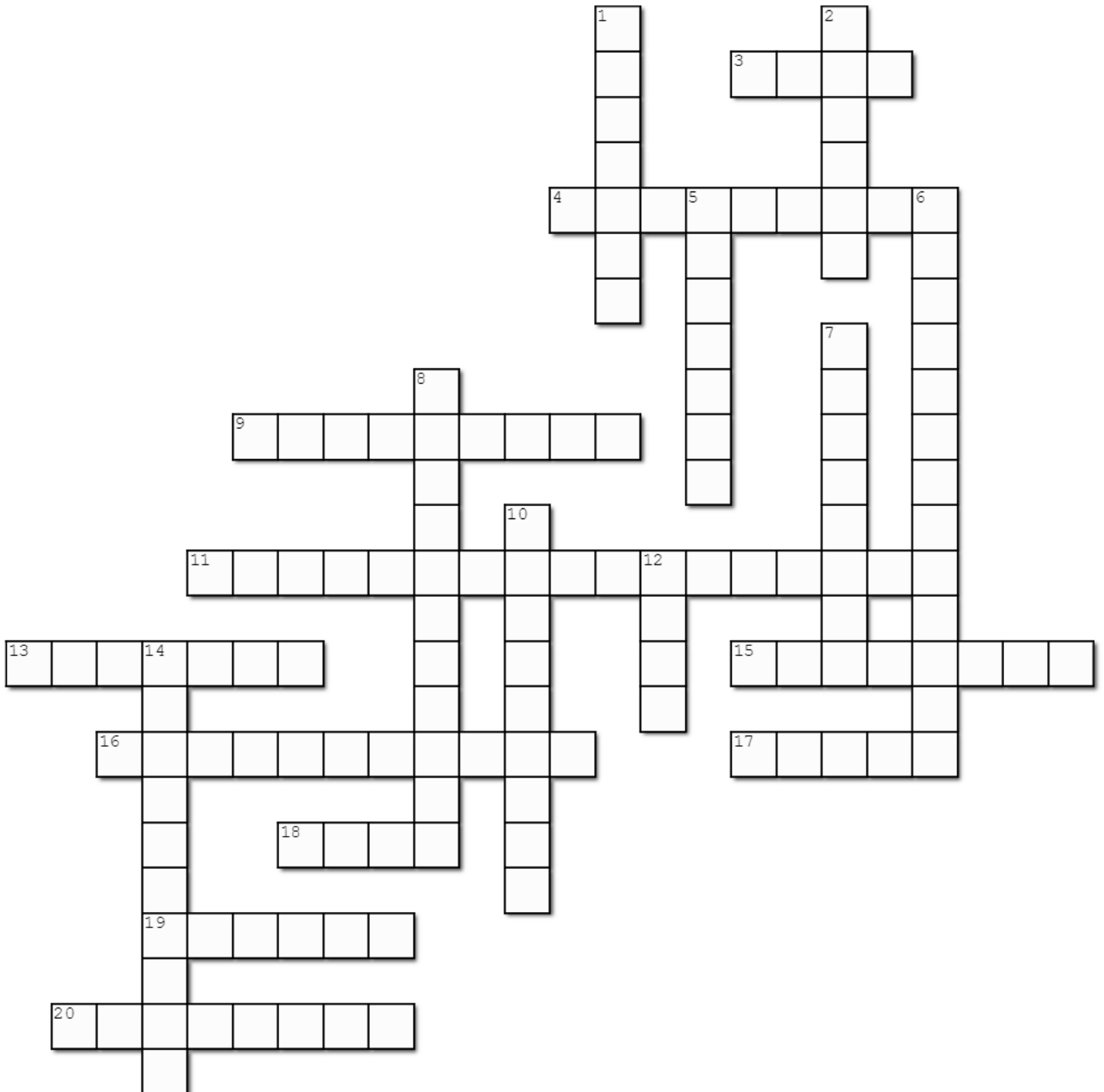


# Gravitational Waves Detected, Confirming Einstein's Theory

Directions: Read the New York Times Article, "Gravitational Waves Detected, Confirming Einstein's Theory" and complete the crossword below



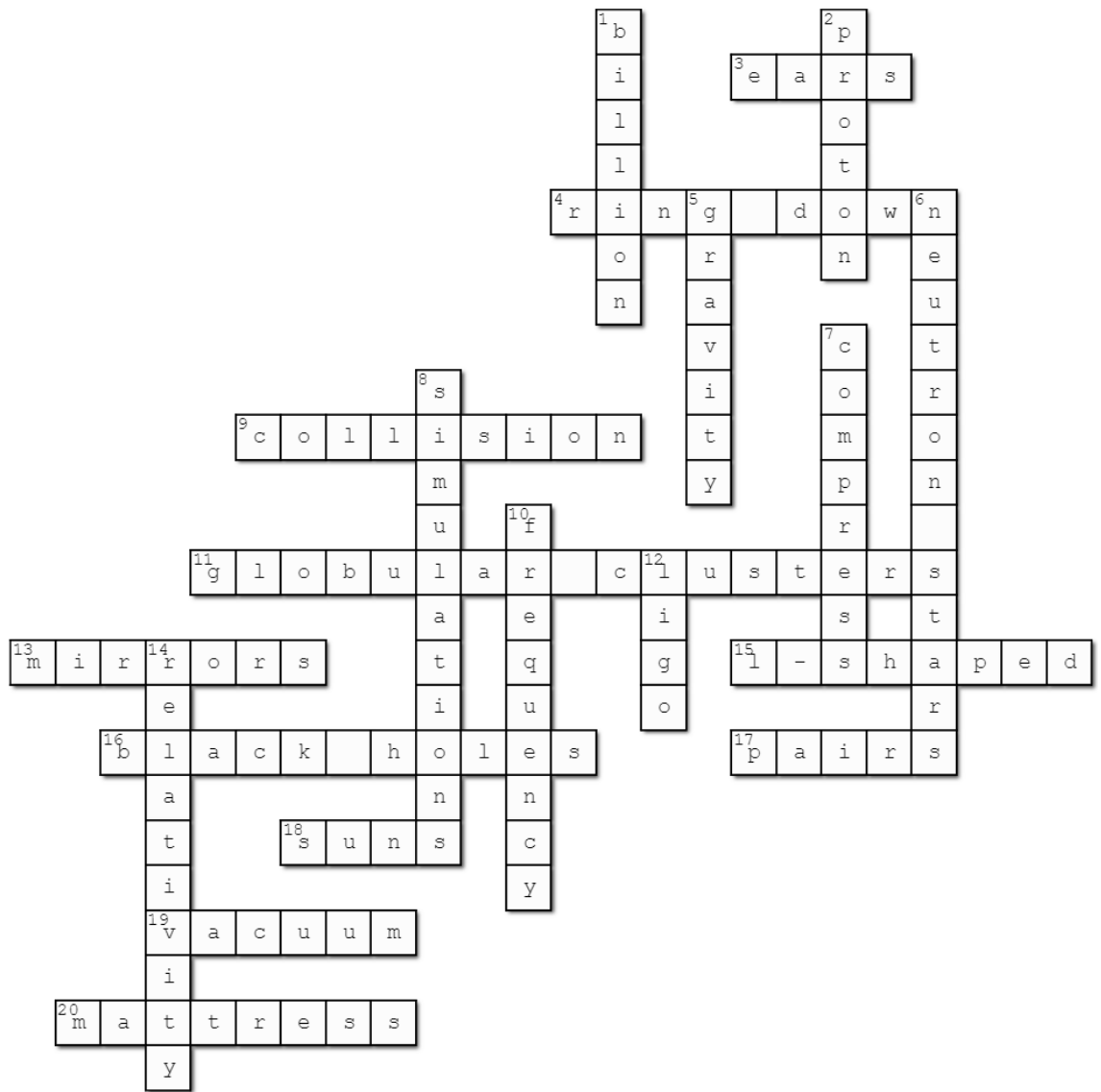
### Across

3. 'astronomy grew....'
4. the unstable blob smoothed itself into a sphere. Three solar masses worth of energy were vaporized into gravitational waves
9. the intense gravity accelerated the black holes to half the speed of light, pulling them closer and carving distortions in space and time
11. dense gatherings of stars known as ....., black holes sink into the center and merge
13. researchers measured the incoming waves using antenna and ...
15. LIGO antenna are ....
16. what converged in space to send gravitational waves?
17. Astronomers now know that .... of black holes exist in the universe
18. became a single black hole with the equivalent mass of 62 ....
19. LIGO ..... tubes complete the design
20. Einstein compared gravitational waves to this household item

### Down

1. colliding black holes were how many light years away?
2. advanced LIGO can detect changes as small as one ten-thousandth the diameter of a ....
5. the effect where matter and energy distort the geometry of the universe
6. LIGO was designed to catch collisions of
7. Gravitational waves would stretch in one direction and .... in another
8. predictions of general relativity for black holes were calculated in computer ...
10. the ..... of the chirp was too low for neutron stars, so scientists knew it was the end of two black holes
12. L-shaped antennas in Washington State and Louisiana known as....
14. Einstein's general theory of...

## Answer Key:



### Across

3. 'astronomy grew....' (**ears**)
4. the unstable blob smoothed itself into a sphere. Three solar masses worth of energy were vaporized into gravitational waves (**ring down**)
9. the intense gravity accelerated the black holes to half the speed of light, pulling them closer and carving distortions in space and time (**collision**)
11. dense gatherings of stars known as ....., black holes sink into the center and merge (**globular clusters**)
13. researchers measured the incoming waves using antenna and ... (**mirrors**)
15. LIGO antenna are .... (**I-shaped**)
16. what converged in space to send gravitational waves? (**black holes**)
17. Astronomers now know that .... of black holes exist in the universe (**pairs**)
18. became a single black hole with the equivalent mass of 62 .... (**suns**)
19. LIGO ..... tubes complete the design (**vacuum**)
20. Einstein compared gravitational waves to this household item (**mattress**)

### Down

1. colliding black holes were how many light years away? (**billion**)
2. advanced LIGO can detect changes as small as one ten-thousandth the diameter of a .... (**proton**)
5. the effect where matter and energy distort the geometry of the universe (**gravity**)
6. LIGO was designed to catch collisions of (**neutron stars**)
7. Gravitational waves would stretch in one direction and .... in another (**compress**)
8. predictions of general relativity for black holes were calculated in computer ... (**simulations**)
10. the ..... of the chirp was too low for neutron stars, so scientists knew it was the end of two black holes (**frequency**)
12. L-shaped antennas in Washington State and Louisiana known as.... (**ligo**)
14. Einstein's general theory of... (**relativity**)