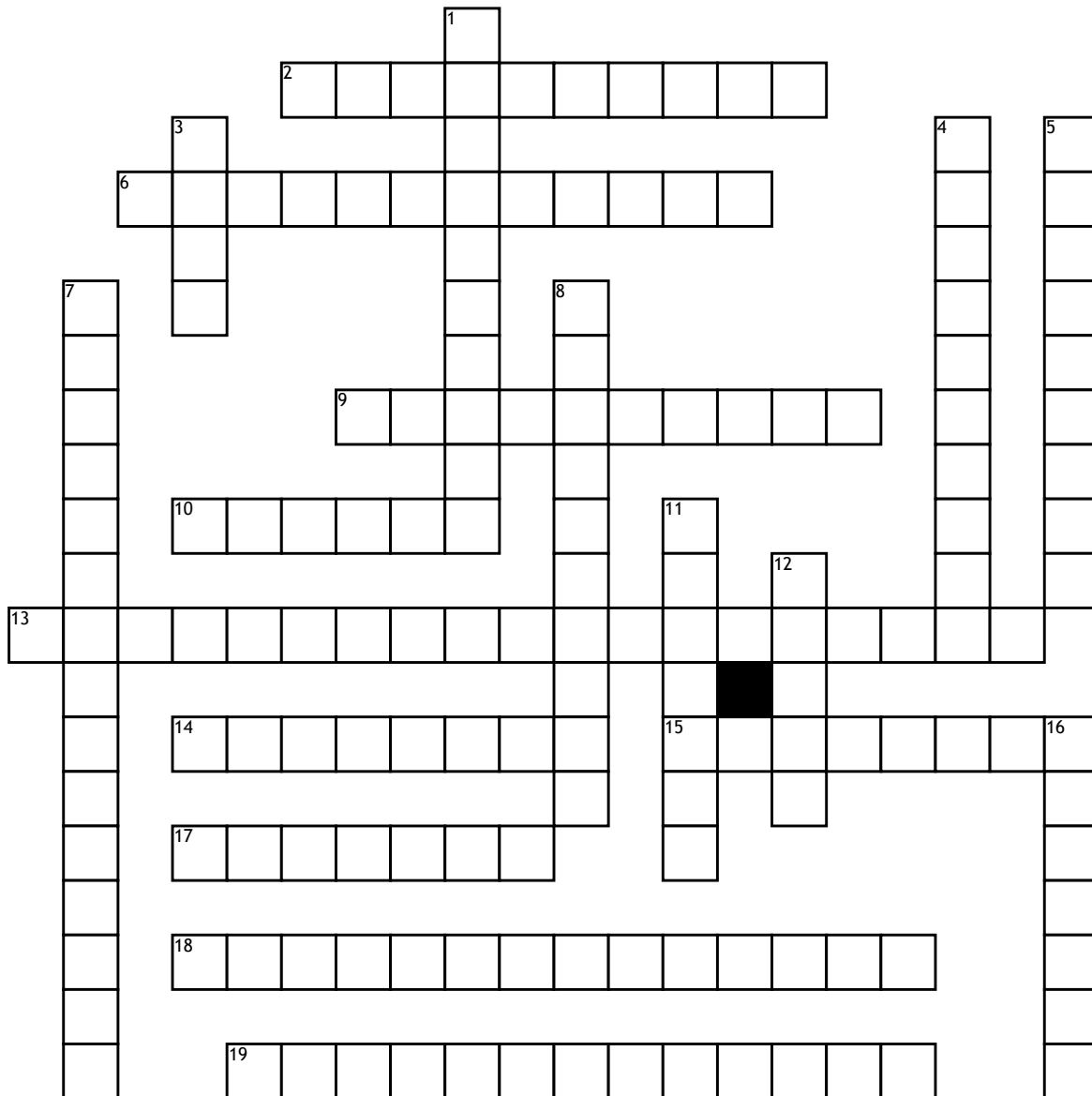


Chapter 4 study activity



Across

2. He was the first to suggest the existence of atoms.
 6. The number of protons in the nucleus of an atom of that element.
 9. A stream of electrons produced at the negative electrode of a tube that contains a low gas pressure.
 10. A subatomic particle that is positively charged.
 13. Based on the results of his experiments, Dalton formulated hypotheses and theories to explain Democritus's observations.
 14. Atoms that have the same number of protons but different number of neutrons.
 15. A subatomic particle that is negatively charged.

17. A subatomic particle with no charge but with a mass nearly equal to a proton.

18. Discovered the proton in 1886
 19. Discovered and confirmed the existence of the neutron in 1932.

Down

1. Transformed Democritus's ideas into a scientific theory
 3. The smallest particle of an element that retains its identity in a chemical reaction.
 4. The total number of protons and neutrons in an atom.
 5. Discovered the electron in 1897 by performing experiments that passed electric current through gases at low pressure.

7. Used his and Thomson's charge-to-mass ratio of an electron to calculate that an electron has one unit of negative charge with a mass of $1/1840$ of a hydrogen atom.
 8. A weighted average mass of the atoms in a naturally occurring sample of the element.
 11. The mass of an atom is concentrated in its _____?
 12. There are _____ known isotopes of hydrogen
 16. The tiny central core of an atom that is composed of neutrons and protons.