

Across

3 A unit of electrical resistance equal to the resistance between two points on a conductor when a potential difference of one volt between them produces a current of one ampere (3)

4 An atom having a valence of one (5)

6 Of higher order or level (4)

8 A discrete amount of something that is analogous to the quantities in quantum theory (6)

10 A colloid that has a continuous liquid phase in which a solid is suspended in a liquid (3)

12 (chemistry) law stating that the proportions in which two elements separately combine with a third element are also the proportions in which they combine together (3,2,10,11)

20 A hypothetical gas with molecules of negligible size that exert no intermolecular forces (5,3)

21 Rotate at very high speed in order to separate the liquids from the solids (10)

22 French chemist who formulated Le Chatelier's principle (1850-1936) (11)

24 (physical chemistry) a distinct state of matter in a system; matter that is identical in chemical composition and physical state and separated from other material by the phase boundary (5)

26 Resistance of a liquid to shear forces (and hence to flow) (9)

29 Formed by reaction between an acid and an alcohol with elimination of water (5)

31 Any group or radical of the form RCO- where R is an organic group (4)

34 A colorless odorless gaseous element that give a red glow in a vacuum tube; one of the six inert gasses; occurs in the air in small amounts (4)

37 The molecular weight of a substance expressed in grams; the basic unit of amount of substance adopted under the Système International d'Unités (4)

38 A heavy ductile magnetic metallic element; is silver-white in pure form but readily rusts; used in construction and tools and armament; plays a role in the transport of oxygen by the blood (4)

39 Enter into a combination with oxygen or become converted into an oxide (7)

40 Explosive consisting of a yellow crystalline compound that is a flammable toxic derivative of toluene (3)

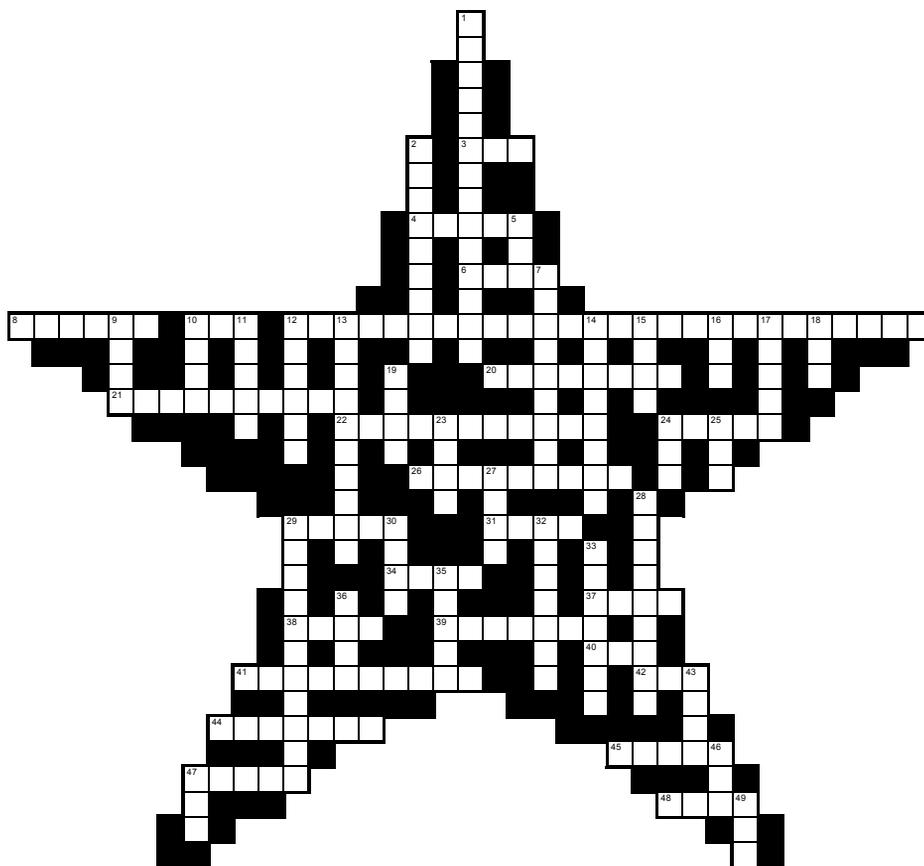
41 Either one of a pair of compounds (crystals or molecules) that are mirror images on each other but are not identical (10)

42 A mineral that contains metal that is valuable enough to be mined (3)

44 A tetravalent nonmetallic element; next to oxygen it is the most abundant element in the earth's crust; occurs in clay and feldspar and granite and quartz and sand; used as a semiconductor in transistors (7)

45 Limited or below average in number or quantity or magnitude or extent Small cold-water silvery fish; migrate between salt and fresh water (5)

47 (trademark) a group of chlorofluorocarbons used as refrigerants; now widely banned as it causes ozone depletion (5)



48 An electrical force linking atoms (4)

Down

1 The branch of physics concerned with the conversion of different forms of energy (14)

2 The science of matter; the branch of the natural sciences dealing with the composition of substances and their properties and reactions (9)

5 An insecticide that is also toxic to animals and humans; banned in the United States since 1972 (3)

7 Swedish chemist and physicist noted for his theory of chemical dissociation (9)

9 A fine grained mineral having a soft soapy feel and consisting of hydrated magnesium silicate; used in a variety of products including talcum powder (4)

10 White crystalline form of especially sodium chloride used to season and preserve food (4)

11 An oily organic compound insoluble in water but soluble in organic solvents; essential structural component of living cells (along with proteins and carbohydrates) (5)

12 A substance that is a fluid at room temperature and pressure (6)

13 The distance (measured in the direction of propagation) between two points in the same phase in consecutive cycles of a wave (10)

14 Any salt of chloric acid (8)

15 A soft heavy toxic malleable metallic element; bluish white when freshly cut but tarnishes readily to dull grey (4)

16 A slippery or viscous liquid or liquefiable substance not miscible with water (3)

17 Any compound of oxygen with another element or a radical (5)

18 A protocol developed for the internet to get data from one network device to another (3)

19 Any of various minerals consisting of hydrous silicates of aluminum or potassium etc. that crystallize in forms that allow perfect cleavage into very thin leaves; used as dielectrics because of their resistance to electricity (4)

23 A corrosive liquid with a pH less than 7; a solution of in water of a substance that releases hydrogen ions (4)

24 A polymer of vinyl chloride used instead of rubber in electric cables (3)

25 Relating to or containing the azo radical (3)

27 A very fine-grained soil that is plastic when moist but hard when fired (4)

28 A material such as glass or porcelain with negligible electrical or thermal conductivity (9)

29 The act of removing or getting rid of something (11)

30 Fill for a short time with sound and echoes (4)

32 A silvery metallic element that is

common in rare-earth minerals; used in magnesium and aluminum alloys (7)

33 A meter that measures the flow of electrical current in amperes (7)

35 A colorless gas (O₃) soluble in alkalis and cold water; a strong oxidizing agent; can be produced by electric discharge in oxygen or by the action of ultraviolet radiation on oxygen in the stratosphere (where it acts as a screen for ultraviolet radiation) (5)

36 A unit of potential equal to the potential difference between two points on a conductor carrying a current of 1 ampere when the power dissipated between the two points is 1 watt; equivalent to the potential difference across a resistance of 1 ohm when 1 ampere of current flows through it (4)

43 An organic compound that contains a hydroxyl group bonded to a carbon atom which in turn is doubly bonded to another carbon atom (4)

46 United States sculptor and architect whose public works include the memorial to veterans of the Vietnam War in Washington (born in 1959) (3)

47 Having a relatively large diameter (3)

49 (biochemistry) a long linear polymer found in the nucleus of a cell and formed from nucleotides and shaped like a double helix; associated with the transmission of genetic information (3)