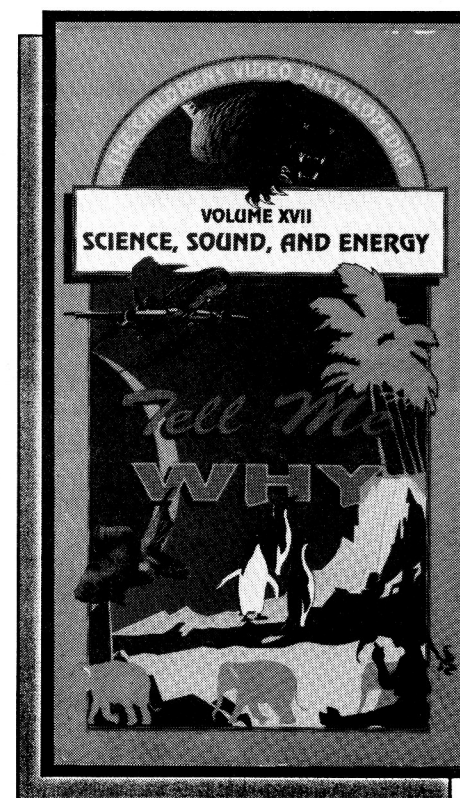


# GLOSSARY

1. ALCHEMY-medieval chemistry.
2. AMPLITUDE-distance the vibrating body moves in its to-and-fro motion.
3. ANCESTOR-a person from whom one is descended.
4. ANTHROPOLOGY-science of mankind.
5. ANTHROPOMETRY-the part of anthropology having to do with measurement of the human body to determine differences in races, individuals, etc.
6. ARCHAEOLOGY-the study of past cultures from artifacts.
7. ATOM- smallest unit making up chemical element.
8. BARYON-one of a class of heavy atomic particles, including the proton, neutron, and the hyperons.
9. BIOLOGY-the science of living matter.
10. BOTANY-the science of plant life.
11. CHEMISTRY-the science of composition of substances.
12. COAL-black, mineral burned as fuel.
13. CURRENTS-rivers of water flowing through the ocean that are warmer or colder than water through which they pass.
14. ECHO-sound repeated by reflection.
15. ECOLOGY-science of relationship between organisms and environment.
16. ELECTRON-minute particle supposed to be or contain a unit of negative electricity.
17. ENERGY-the ability to do work.
18. ENVIRONMENT-surrounding things, conditions, etc.
19. ETHNOLOGY-science dealing with physical differences between the various human races.
20. EVOLUTION-the development of a species, organism, or organ from its original rudimentary state to its present or completed state.
21. EXCAVATION-something unearthed by digging.
22. EXPERIMENT-a test or trial of something.
23. FOSSIL-petrified remains of animal or plant.
24. FREQUENCY-speed of vibration of the sounding object.
25. FUEL-substance that maintains fire.
26. GASOLINE-inflammable liquid from petroleum used especially as motor fuel.
27. GEOLOGICAL TIME-history of the earth.
28. GEOLOGY-science of earth's structure.
29. HEAT-form of energy raising temperature.
30. HYPERON-any of a class of baryons which are heavier than nucleons.
31. KEROSENE-a type of oil.
32. KINETIC ENERGY-that energy of a body which results from its motion.
33. MATTER-what a thing is made of.
34. MEDIUM-something that carries sound from its source to the hearer.
35. MESON-an unstable particle, first observed in cosmic rays, having a mass between that of the electron and the proton.
36. MOLECULE-smallest physical unit of a chemical element.
37. NATURAL GAS-mixture of combustible gases and vapors, chiefly methane.
38. NEUTRINO-a hypothetical neutral particle smaller than a neutron.
39. NEUTRON-particle in nucleus of atom.
40. NOISE-sound, especially loud or harsh.
41. OCEANOGRAPHY-study of oceans.
42. OVERTONE-musical tone added to basic tone.
43. PALAEOBOTANY-study of fossil plants.
44. PETROLEUM-oily liquid occurring naturally; source of gasoline, kerosene, paraffin, etc.
45. PITCH-highness or lowness of a sound.
46. PLANT ANATOMY-structure of plants and how they might be related.
47. PLANT PATHOLOGY-study of plant disease.
48. PLANT PHYSIOLOGY-study of the way plants breathe and make food.
49. POROUS-permeable by water.
50. POSITRON-the positive counterpart of an electron, having approximately the same mass and magnitude of charge.
51. POTENTIAL ENERGY-energy that is the result of relative position instead of motion.
52. PROTON-part of an atom bearing positive charge.
53. RADIUM-radioactive metallic element.
54. SCIENCE-systematic knowledge, especially of physical world.
55. SEACOAST-borderline between land and sea.
56. SEDIMENTARY ROCK-rock formed by deposit of any matter or mass by water or wind.
57. SHALE-kind of layered rock.
58. SOUND-sensation affecting organs of hearing, produced by vibrations.
59. TIDES-regular movements of the waters caused by pull of the moon and sun.
60. TIMBRE-characteristic quality of a sound.
61. VIBRATION-moving back and forth of some object.
62. ZOOLOGY-science of animals.

# *Tell Me* **WHY** *TEACHER'S GUIDE*



## VOLUME XVII SCIENCE, SOUND, AND ENERGY

## SUGGESTED TEACHING STRATEGIES

1. Discuss how anthropology relates to the sciences of anatomy, physiology, psychology, ethics, sociology. See if you can think of any other field related to anthropology.
2. Describe the three (3) basic divisions of anthropology.
3. Discuss what you would expect to find on an archeological excavation.
4. Discuss the importance of studying ecology.
5. Discuss the practical sides of geology.
6. Research various elements and who discovered them.
7. Diagram the study of oceanography. Research its branches and determine their relationships to each other as well as to man's survival.
8. Diagram how we hear various types of sounds.
9. Discuss the advantages of sonar for animals as well as for man.
10. Determine why energy is not lost or created, only changed.
11. Compare and contrast various sources of energy.
12. Discuss how the discovery of the atom has changed man's way of thinking.

### CONCEPTS AND TERMS TO LISTEN AND WATCH FOR:

SCIENCE	SEACOAST
BIOLOGY	TONE
ECOLOGY	ECHO
GEOLOGY	FUEL
OCEANOGRAPHY	ELECTRON
PITCH	ARCHAEOLOGY
SONAR	GENETICS
COAL	CHEMISTRY
ATOM	FOSSIL
NEUTRON	VIBRATIONS
ANTHROPOLOGY	COMPRESSION
BOTANY	POTENTIAL ENERGY
ZOOLOGY	NATURAL GAS
SEDIMENTARY ROCK	PROTON

## QUESTIONS FOR THOUGHT, DISCUSSION AND FURTHER STUDY

1. Is anthropology merely the study of man? Why?
2. What were the earlier purposes for the study of botany? How have they changed? How have they remained the same?
3. What can we learn from studying fossils of animals and plants?
4. What factors affect tides?
5. What would you find on the bottom of the ocean floor?
6. What are the mediums that carry sound?
7. What affects the amplitude of sound?
8. What is pitch?
9. Through which medium does sound travel fastest?
10. How does temperature affect the speed of sound?
11. What types of surfaces are best for producing echoes?
12. What is potential energy?
13. What is kinetic energy?
14. Why is energy neither created nor destroyed?
15. What was the first source of fuel first used in mass quantities?
16. What are the advantages to using coal over wood?
17. What are natural gases?
18. Who discovered the atom?
19. What is an atom composed of?

### CAREER OPPORTUNITIES

ARCHAEOLOGIST	GEOLOGIST
BIOLOGIST	ENGINEER
LAB TECHNICIAN	COAL MINER
SOUND ENGINEER	BOTANIST
PHYSICIST	CHEMIST
ANTHROPOLOGIST	OCEANOGRAPHER
PALEONTOLOGIST	SONAR TECHNICIAN

## SUGGESTED TEACHING STRATEGIES

1. Label parts of the skin.
2. Label the major parts of the human skeleton.
3. Discuss the process by which bones grow and heal.
4. Construct working models of human joints to demonstrate how muscles work in creating movement.
5. Label the three (3) major parts of the brain, naming functions associated with each part.
6. Trace the path of oxygen from inhalation to exhalation.
7. Research the path taken by food, beginning at intake and ending with the digestive tract.
8. Test to map-out the location of bitter, sweet, sour and salt receptor taste buds on your tongue.
9. Compare the human eye to a camera.
10. Trace the path of blood through the body.
11. Discuss the function of various organs such as the kidneys and intestines.
12. Discuss different hereditary aspects affected by genes.

## CONCEPTS AND TERMS TO LISTEN AND WATCH FOR

EPIDERMIS	BLOOD VESSELS	TASTE BUDS
SKELETON	FRACTURE	PUPIL
CARTILAGE	SADDLE JOINT	IRIS
ROTARY JOINT	STRIATED MUSCLES	LARYNX
SMOOTH MUSCLES	CORTEX	STIRRUP
CEREBELLUM	MEDULLA	GENES
CEREBROSPINAL	OBLONGATA	MELANIN
NERVOUS SYSTEM	AUTOMATIC SYSTEM	SALIVA
DERMIS	BRONCHI	CORNEA
BONE MARROW	RETINA	LYMPHOID
SYNOVIAL FLUID	AQUEOUS HUMOR	HAMMER
BALL & SOCKET	TONSILS	EAR DRUM
JOINT	ANVIL	HEREDITY
CARDIAC MUSCLES	EQUILIBRIUM	
CEREBRUM	CHROMOSOMES	

## QUESTIONS FOR THOUGHT, DISCUSSION AND FURTHER STUDY

1. What are the two (2) layers of skin?
2. What is a compound fracture?
3. How does a bone heal once a fracture occurs?
4. What prevents bones from touching at the joints?
5. What do the striated muscles control?
6. What do the smooth muscles control?
7. What do the cardiac muscles control?
8. How do muscles work?
9. What happens to our bodies when we sleep?
10. What is the function of the cerebrospinal nervous system?
11. What is the function of the automatic system?
12. Why do we need to breathe?
13. How is food digested?
14. What is the purpose of blinking?
15. What is the purpose of each major group of teeth: the Incisors; the Cuspids; the Bicuspid; the Molars?
16. What is the job of tonsils?
17. How do your ears help us keep our sense of equilibrium?
18. How many beats does the heart make per minute? per hour? per day?
19. How long are the long intestines?
20. What do genes control?
21. How many different chromosomes does a person have?
22. What are some features that are passed on through heredity?

## CAREER OPPORTUNITIES

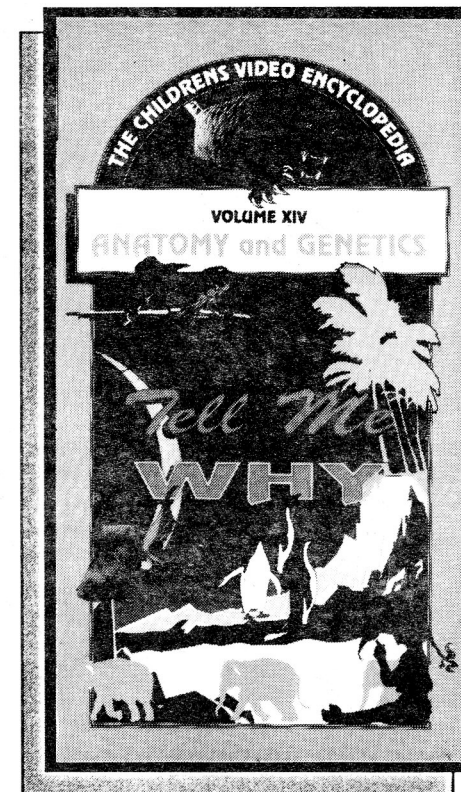
DOCTOR	OPTICIAN
PARAMEDIC	GENETIC COUNSELOR
MEDICAL ASSISTANT	MEDICAL RESEARCHER
OPTOMETRIST	BIOMEDICAL ENGINEER
SURGEON	OCCUPATIONAL THERAPIST
NURSE	SPEECH THERAPIST
TEACHER	MEDICAL TECHNICIAN
PHYSICAL THERAPIST	



# GLOSSARY

1. ADENOIDS-glandlike; of or like lymphoid tissue.
2. AMYLASE-an enzyme that helps change starch into sugar, found in saliva.
3. ANTERIOR CHAMBER-the space between the cornea and the iris.
4. ANVIL-the incus, one of the three bones of the middle ear.
5. AQUEOUS HUMOR-a transparent fluid occupying the space between the crystalline lens and the cornea of the eye.
6. BICUSPID-found in the back of the cuspid's whose purpose is to tear and crush food.
7. BLINK-to wink rapidly.
8. BLOOD CLOT-a coagulation, particularly of soft or fluid matter, which forms into a mass or lump.
9. BONE-any part or piece of the hard tissue forming the skeleton of most full-grown vertebrate animals, especially a piece between two joints.
10. BONE MARROW-the soft vascular fatty tissue contained in the cavities of most bones.
11. BRAIN-the mass of nerve tissue in the cranium made up of gray and white matter and is the main part of the nervous system.
12. BRITTLE-easily broken or shattered.
13. BRONCHI-either of the two main branches of the trachea, or windpipe.
14. CARTILAGE-a tough, elastic, whitish animal tissue, most of which later turns to bone.
15. CELL-a very small unit of protoplasm, usually with a nucleus and an enclosing membrane.
16. CEMENTUM-bony material that covers the root of the tooth.
17. CEREBELLUM-located in back of the skull and controls balance and coordination.
18. CEREBRUM-the upper, main part of the brain consisting of two equal hemispheres.
19. CHROMOSOME-any of the microscopic rod-shaped bodies into which the chromatin separates during Mitosis; they carry the genes that convey hereditary characteristics.
20. CILIA-hair-like projections of certain cells, capable of vibratory movement.
21. COMPLETE FRACTURE-break across the bone so that the bone is broken in two places.
22. COMPOUND FRACTURE-broken bone where broken ends protrude through the skin.
23. CONTRACT-to draw together.
24. CORNEA-the transparent tissue forming the outer coat of the eyeball and covering the iris and pupil.
25. CORTEX-the part of the brain where all voluntary actions are controlled.
26. CROWN-the enamel-covered part of a tooth projecting beyond the gum line.
27. CUSPID-tooth that tears food on either side of the incisors.
28. DENTINE-ivory-like material that forms the body of the tooth.
29. DERMIS-the layer of skin just below the epidermis.
30. DEXTRIN-a soluble, gummy substance obtained from starch and used as an adhesive.
31. DIGESTION-the absorption of food.
32. DORSAL NERVE-back roots that carry messages to the brain and controls sensation.
33. EARDRUM-the middle ear; the thin membrane that separates the middle ear from the external ear and vibrates when struck by sound waves.
34. EMBRYO-the human organism in the first three months after conception.
35. ENAMEL-the hard, white, glossy coating of the crowns of teeth.
36. EPIDERMIS-the outermost layer of the skin having no blood vessels and consisting of several layers of cells; it covers the dermis.
37. EQUILIBRIUM-a state of balance of equality between opposing forces.
38. EUSTACHIAN TUBE-a slender tube between the middle ear and the pharynx, which serves to equalize air pressure on both sides of the eardrum.
39. EYE-organ of sight in man and mammals.
40. EYEBALL-the ball-shaped part of the eye, enclosed by the socket and eyelids.
41. EYEBROW-the bony arch over each eye with hair growing on it.
42. EYELASH-any of the hairs on the edge of the eyelid.
43. FETUS-the human organism from the fourth month after conception to birth.
44. FIBER-a slender, threadlike structure that combines with others to form animal or vegetable tissue.
45. FRACTURE-a break in a bone, or occasionally, a tear in a cartilage.
46. GENE-a unit of heredity.
47. GREENSTICK FRACTURE-a bone that is cracked with part of the shaft broken, and the remainder bent.
48. HEART-the hollow, muscular organ that receives blood from the veins and sends it out through the arteries by alternate dilation and contraction.
49. INCISOR-tooth in center of the mouth that cuts food.
50. INTESTINE-the lower part of the alimentary canal, extending from the stomach to the anus and consisting of a convoluted upper part and a lower part of greater diameter.
51. JOINT-a place or part where two bones or corresponding structures are joined, usually so that they can move.
52. LID-either of the two movable folds of flesh that cover and uncover the front of the eyeball.
53. LYMPH-a clear, yellowish, alkaline fluid found in the lymphatic vessels of the body, resembling blood plasma but containing only colorless corpuscles.
54. LYMPHOIDS-of or like lymph or the tissue of the lymph glands.
55. MELANIN-pigment or coloring matter.
56. MOLAR-tooth found in the back of the mouth used to grind food.
57. PALATE-the roof of the mouth, consisting of a hard bony forward part and a soft fleshy back part.
58. PHARYNX-the muscular and membranous cavity of the alimentary canal leading from the mouth and nasal passages to the larynx and esophagus.
59. SALIVA-the thin, watery, slightly viscid fluid secreted by the salivary glands; the liquid in the mouth.
60. SECRETION-the separation and elaboration of a substance from the blood.
61. SKELETON-framework of the body made of cartilage and bone.
62. SKULL-hard bony structure which protects the brain.
63. SPINAL CORD-the thick cord of nerve tissue of the central nervous system extending down the spinal canal from the medulla oblongata.
64. TISSUE-the substance of an organic body or organ, consisting of cells and intercellular material.
65. TONGUE-the movable muscular structure attached to the floor of the mouth.
66. TONSILS-either of a pair of oval masses of lymphoid tissue, one on each side of the back of the mouth, leading to the pharynx.
67. TOOTH-any set of hard, bone-like structures set in the jaws of most vertebrates and used for biting, tearing, and chewing.

# Tell Me WHY TEACHER'S GUIDE



## VOLUME XIV ANATOMY AND GENETICS