

# ★ 8th Grade Science Test ★

## CAPTURING & CONVERTING ENERGY

1. Which device converts sunlight into electrical energy?
  - A. Solar panel
  - B. Battery
  - C. Wind turbine
  - D. Generator
  
2. A hydroelectric dam mainly converts:
  - A. Light energy into heat
  - B. Chemical energy into motion
  - C. Water's kinetic energy into electricity
  - D. Sound energy into heat
  
3. A wind turbine blade spins because of:
  - A. Gravity changes
  - B. Water pressure
  - C. Moving air
  - D. Vibrating particles
  
4. Which type of energy is captured from ocean waves?
  - A. Chemical
  - B. Nuclear
  - C. Mechanical
  - D. Electrical
  
5. Which condition increases the energy captured by a turbine?
  - A. Weak winds
  - B. Steady, strong winds
  - C. No wind
  - D. Random airflow



# SOUND WAVES

6. Sound travels fastest in:
  - A. Air
  - B. Metal
  - C. Outer space
  - D. A vacuum
  
7. What property determines the pitch of a sound?
  - A. Amplitude
  - B. Wavelength
  - C. Frequency
  - D. Speed
  
8. What must occur for sound to be produced?
  - A. Heat transfer
  - B. Vibrations
  - C. Radiation
  - D. Reflection
  
9. A louder sound has a greater:
  - A. Frequency
  - B. Speed
  - C. Amplitude
  - D. Wavelength
  
10. Sound cannot travel through:
  - A. Solids
  - B. Liquids
  - C. Gases
  - D. Empty space



# LIGHT WAVES

11. Light bending as it enters a new medium is called:
  - A. Reflection
  - B. Refraction
  - C. Absorption
  - D. Diffraction
  
12. Light traveling in a straight line explains why:
  - A. Prisms form rainbows
  - B. Shadows form
  - C. Light heats objects
  - D. Metal shines
  
13. Which material is translucent?
  - A. Aluminum foil
  - B. Wax paper
  - C. Clear window
  - D. Wood
  
14. Which color has the longest wavelength?
  - A. Red
  - B. Blue
  - C. Green
  - D. Violet
  
15. White light splitting into colors in a prism demonstrates:
  - A. Absorption
  - B. Transmission
  - C. Different wavelengths refract differently
  - D. Reflection



# ELECTROMAGNETIC WAVES

16. Unlike sound waves, electromagnetic waves:
- A. Require matter
  - B. Travel only through gases
  - C. Can travel through space
  - D. Move slower than sound
17. Which EM wave has the most energy?
- A. Radio
  - B. Microwave
  - C. Infrared
  - D. Gamma
18. Which EM wave is used in TV remote controls?
- A. Infrared
  - B. Ultraviolet
  - C. Microwaves
  - D. Radio
19. Which type of EM wave is blocked by sunscreen?
- A. Radio
  - B. UV
  - C. Microwave
  - D. Visible light
20. Which EM wave is used in medical imaging?
- A. Radio
  - B. X-rays
  - C. Microwaves
  - D. Infrared



# WAVELENGTH

21. Wavelength is the distance from:
- A. Crest to crest
  - B. Amplitude to trough
  - C. Source to receiver
  - D. Start to end
22. A wave with a low frequency has a:
- A. Short wavelength
  - B. Long wavelength
  - C. High amplitude
  - D. Low amplitude
23. If wavelength decreases, frequency:
- A. Decreases
  - B. Stays the same
  - C. Increases
  - D. Disappears
24. Which has the shortest wavelength?
- A. Infrared
  - B. Radio
  - C. Microwaves
  - D. Gamma rays
25. Wavelength and energy have what relationship?
- A. Longer wavelength = higher energy
  - B. Shorter wavelength = lower energy
  - C. Shorter wavelength = higher energy
  - D. They are unrelated



## GENES / CHROMOSOMES / DNA

26. DNA is found mainly in the:
- A. Nucleus
  - B. Vacuole
  - C. Golgi body
  - D. Ribosome
27. Genes are segments of:
- A. RNA
  - B. Cytoplasm
  - C. DNA
  - D. Protein
28. Chromosomes are made of:
- A. Fat molecules
  - B. Water
  - C. DNA wrapped around proteins
  - D. Sugars
29. A human body cell contains:
- A. 23 pairs of chromosomes
  - B. 12 pairs of chromosomes
  - C. 10 chromosomes
  - D. 1 chromosome
30. DNA contains instructions to build:
- A. Minerals
  - B. Proteins
  - C. Carbohydrates
  - D. Lipids

## MITOSIS vs MEIOSIS

31. Mitosis produces:
- A. 2 identical cells
  - B. 4 unique cells
  - C. Sex cells only
  - D. No cells
32. Meiosis results in:
- A. Growth
  - B. Gametes
  - C. Tissue repair
  - D. Cloning
33. Which process increases genetic diversity?
- A. Mitosis
  - B. Meiosis
  - C. Binary fission
  - D. Budding
34. Mitosis is important for:
- A. Producing gametes
  - B. Creating variation
  - C. Repairing damaged tissue
  - D. Performing photosynthesis
35. Crossing over occurs during:
- A. Mitosis
  - B. Fertilization
  - C. Meiosis
  - D. Asexual reproduction



# SEXUAL vs ASEXUAL REPRODUCTION

36. Asexual reproduction produces:
- A. Genetically identical offspring
  - B. High variation
  - C. Offspring from two parents
  - D. Slow reproduction
37. A disadvantage of sexual reproduction is:
- A. Requires two parents
  - B. Low variation
  - C. No energy required
  - D. Occurs rarely
38. A benefit of sexual reproduction is:
- A. Offspring are clones
  - B. Increased genetic variation
  - C. Faster reproduction
  - D. Less energy needed
39. Which is an example of asexual reproduction?
- A. Dog breeding
  - B. Plant pollination
  - C. Bacteria dividing
  - D. Frog mating
40. Which is a benefit of asexual reproduction?
- A. More variation
  - B. High survival of all offspring
  - C. Fast reproduction
  - D. Offspring from two parents



# MUTATIONS (PROS & CONS)

41. A mutation is a change in:
- A. DNA
  - B. Blood flow
  - C. Protein shape
  - D. Cell wall strength
42. Which mutation effect is harmful?
- A. A trait that increases survival
  - B. A disease-causing change
  - C. A trait that provides camouflage
  - D. Increased variation
43. Which mutation effect is beneficial?
- A. Weaker immune system
  - B. Decreased variation
  - C. Better resistance to diseases
  - D. Cell death
44. Mutations can create more:
- A. Heat energy
  - B. Water molecules
  - C. Variations
  - D. Food
45. A mutation that changes a protein may change a(n):
- A. Trait
  - B. Season
  - C. Sound wave
  - D. Habitat



# MENDELIAN GENETICS

46. A recessive allele is represented by a:
- A. Lowercase letter
  - B. Capital letter
  - C. Number
  - D. Symbol
47. If **T = tall** and **t = short**, which is **homozygous recessive**?
- A. TT
  - B. Tt
  - C. tt
  - D. tT
48. A Punnett square predicts:
- A. Guaranteed traits
  - B. Possible traits
  - C. Environmental effects
  - D. Protein production
49. Two heterozygous parents ( $Rr \times Rr$ ) produce a recessive phenotype:
- A. 0%
  - B. 25%
  - C. 50%
  - D. 100%
50. An inherited trait is one that:
- A. Is learned
  - B. Comes from parents
  - C. Occurs only in adults
  - D. Cannot change



# NATURAL SELECTION & EVOLUTION

51. Natural selection causes organisms with helpful traits to:
- A. Reproduce more
  - B. Disappear
  - C. Stop changing
  - D. Become identical
52. Finches developing different beak shapes is evidence of:
- A. Mitosis
  - B. Natural selection
  - C. Chemical digestion
  - D. Weathering
53. If fast rabbits escape predators, generations later the rabbit population will:
- A. Become slower
  - B. Become faster
  - C. Stop reproducing
  - D. All become identical
54. Darwin concluded species:
- A. Never change
  - B. Change over long periods
  - C. Change instantly
  - D. Appear randomly
55. The formation of a new species is called:
- A. Meiosis
  - B. Speciation
  - C. Radiation
  - D. Growth



# ARTIFICIAL SELECTION & GENETIC ENGINEERING

56. Artificial selection is when:
- A. Nature chooses traits
  - B. Humans choose traits
  - C. Mutations occur
  - D. Meiosis slows
57. Genetic engineering allows scientists to:
- A. Turn DNA off
  - B. Change genes directly
  - C. Stop reproduction
  - D. Increase mutations
58. A **pro** of artificial selection is:
- A. Guaranteed survival
  - B. Creating desirable traits
  - C. Always perfect health
  - D. Unlimited variation
59. A **con** of genetic engineering is:
- A. Improved crop yield
  - B. Possible unknown effects
  - C. Stronger plants
  - D. Healthier animals
60. GM crops may be helpful because they can:
- A. Pollute water
  - B. Grow slower
  - C. Resist pests
  - D. Reduce yield