

Mastering FCAT Science Content Through Games



Division of Mathematics and Science Education
Dr. Michael M. Krop Senior High School
Miami-Dade County Public Schools

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Introduction

Preparing students for the Florida Comprehensive Assessment Test (FCAT) in Science can be an overwhelming task. Upon reviewing the materials that are available to prepare students, teachers quickly realize that there is too much information involving multiple areas (i.e. physics, earth space, chemistry) to cover within the construct of a single 10th grade course. Trying to review multiple science disciplines, along with the current course Sunshine State Standards, is often just not feasible. Additionally, too often students relate FCAT to something that they do not like. Just the mere mention of the word FCAT has a negative connotation to many students. The task for teachers is to meet the challenge of incorporating FCAT Science content into classroom instruction that is both meaningful and enjoyable.

After reviewing a series of practice FCAT Science tests, it is evident that the key to answering many of the multiple choice questions is being able to understand the language used in the questions. It becomes apparent that vocabulary is a key factor. If students can master the terminology, they are more likely to analyze questions and formulate correct responses.

As part of the initiative to have the student master Science FCAT content, the 204 vocabulary words identified by the State as Science FCAT in grades 5, 8 and 10 were incorporated into a variety of classroom games. Learning 204 vocabulary words could be boring thus the idea of using games to teach and reinforce content becomes an engaging activity for both teacher and student. Using ideas from the Teacher Discovery Science Catalog, the Miami-Dade County Public Schools (M-DCPS) Division of Mathematics and Science Education Website and classroom teachers, a variety of games were developed, tried, refined, and are now being shared with other teachers throughout the district..

For the past two years, these games have been used in the 10th grade regular biology classes. The results went far beyond expectations. Listed below are some the benefits that three teachers have experienced for the past two years.

- Approximately 90% of the students made an “A” on each of the vocabulary tests consisting of 25 words each.
- Students equated Science FCAT with having fun.
- All of the students had the opportunity to participate.
- Students came to class excited about learning new Science FCAT words.
- Students spontaneously shared positive feedback on a regular basis such as, “Wow, it was so easy to learn all of these words,” “I never realized learning could

be so much fun,” and “I can’t believe the class period is already over, can we play again next class?”.

- Students began recognizing the Science FCAT words in science videos, in the current events articles and assignments, and in articles that they read for biology as well as in other classes. They clearly showed a greater understanding of assigned reading assignments across the curriculum.
- FCAT Science scores in our school not only exceeded the District average but they exceeded the State average.
- FCAT Reading scores also increased this past year. There is a strong research based argument that the increased vocabulary will increase standardized test scores and this proved true for our students.
- The “game format” was used as a test review for the final exam. It was not used for the midterm exam. The overall GPA average for the midterm exam was 1.74. The overall GPA average for the final exam was 2.03 demonstrating a greater retention rate by using the games as a teaching tool.
- Most importantly, the information gathered at the end of the year through the “Teacher Evaluation” form indicated student recognition of the strategies as contributor to their success. 89% of students identified the FCAT Science games as the most exciting and 67% named the games as the most exciting and the most valuable activities that they did throughout the year. Their reasoning was that they had fun and learned at the same time and most importantly, they were able to retain the information beyond the test date.

Using games as a teaching tool has proved to be very successful and can be used and be adapted to any level, elementary, middle, or senior high school. Incorporating the games into classroom instruction has multiple benefits but timing is critical. Games should be played the last 30-45 minutes of the period. Students are too excited to settle back down for a different activity immediately. Transition becomes very important. When used appropriately these and other strategies, as part of a teacher’s “bag of tricks” can assist students in passing the Science FCAT and applying knowledge across curriculum.

It is the sincere wish of the teachers who developed the activities for Mastering FCAT Science Content Through Games, that other teachers implement, modify, and share these and other strategies in a spirit of professional collaboration.

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FCAT Science Vocabulary Definitions

The following 204 science vocabulary FCAT words are those identified by the State of Florida in grades five, eight, and ten. Some of the definitions have been modified to challenge students and assist them in utilizing higher-order thinking skills.

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| 1. Abiotic | an environmental factor not associated with living organism |
| 2. Acceleration | = velocity/time; rate of change in velocity, usually expressed in meters per second squared |
| 3. Accuracy | the extent to which a measurement is near the standard or expected value |
| 4. Acid | a substance that increases the H^+ (positive ion) concentration when added to a water solution |
| 5. Activation Energy | the least amount of energy required to start a particular chemical reaction |
| 6. Adaptation | a particular change in a population of organisms, in response to changes in the populations |
| 7. Air Resistance | force of air on moving objects |
| 8. Allele | any alternate form of a gene that an organism may have for a particular trait |
| 9. Amino Acids | an organic molecule that makes up proteins; proteins are synthesized |
| 10. Amplitude | in any periodic function (e.g., a wave) the distance between the position of rest and the highest point of a wave. |
| 11. Aqueous | a solution containing water |
| 12. Asexual
Reproduction | new individuals are formed without the involvement gametes (ie, budding) |
| 13. Astronomical Unit | the average distance from Earth to the Sun, approximately 150 million kilometers |
| 14. Atmosphere | the layers of gas that surround Earth, other planets, or stars |
| 15. Atom | the smallest unit of matter |
| 16. Atomic Number | the total protons in an atom's nucleus |

17. Axis	the imaginary line on which an object rotates (runs through Earth between the North Pole and the South Pole)
18. Base	a substance that increases the OH^- concentration of a solution; a proton acceptor
19. Biodiversity	the existence of different species in a given area or specific period of time
20. Biome	a community characterized by the interaction of living organisms and climate factors
21. Biotic	factors in an environment relating to living organisms
22. Calorie	unit of energy; the amount of heat needed to raise one gram of water one degree Celsius at standard atmospheric pressure
23. Carnivore	animal or plant that consume or obtains nutrients from animals; meat-eater
24. Catalyst	a substance that speeds up or slows down the rate of a reaction
25. Centrifugal Force	the motion pushing away from center or axis
26. Centripetal Force	the force on an object toward the center of the circle
27. Change of State	a physical change that occurs when matter changes to a liquid, gas, or solid
28. Chemical Change	a change in a substance that results in producing a different chemical
29. Chemical Weathering	the breakdown of rocks as a result of chemical processes
30. Circuit	connection of electrical elements forming a complete path for the flow of current
31. Community	all the populations belonging to different species and sharing the same area
32. Compound	a substance made up of at least two different elements held together by chemical bonds

33. Concentration	the relative amount of a particular substance
34. Condensation	the process of changing from a gas to a liquid
35. Conduction	direct heating; the transmission of heat through a medium and without the motion of the medium
36. Conservation	controlled use and/or maintenance of natural resources; efforts to preserve or protect
37. Conservation of Energy	a fundamental principle stating energy cannot be created or destroyed but only change form
38. Conservation of Mass	the principle that mass cannot be created or destroyed
39. Constellation	a star pattern identified and named as a definite group; usually thought of as forming certain shapes or figures in a specific region of the sky
40. Consumer	an organism that feeds on another organism for food
41. Convection	heat transfer in a gas or liquid by the circulation of currents from one region to another
42. Convergent Boundary	area where two tectonic plates collide
43. Covalent Bond	a chemical link between two atoms of the same or different elements in which each atom shares an electron
44. Crest	the peak or highest point on a wave
45. Crust	outermost layer of Earth covering the mantle
46. Decomposer	any organism that feeds or obtains nutrients by breaking down organic matter from dead organisms
47. Density	concentration of matter of an object; number of individual in the same species that live in a given area; the mass per unit volume of a substance in a given area
48. Dependent Variable/ Responding Variable	factor being measured or observed in an experiment
49. Deposition	layering matter in a natural process
50. Diffraction	the bending of a wave around an obstruction

51. DNA	a nucleic acid that carries genetic material; present in all cellular organisms
52. Dominance	tendency of certain alleles to mask the expression of their corresponding alleles
53. Earthquake	shaking of the ground caused by a sudden release of energy in the crust
54. Ecosystem	an ecological community, together with its environment, functioning as a unit
55. Efficiency	the relative effectiveness of a system or device determined by comparing input and output
56. Electromagnet	consisting of a coil of wire wrapped around a core; becomes strongly magnetized when current flows through the coil producing a magnetic field
57. Electromagnetic Radiation	the emission of the entire range of electromagnetic spectrum including: gamma rays, x-rays, ultraviolet radiation, visible light, microwaves, and radio waves
58. Electromagnetic Waves	generated by the oscillation of a charged particle and characterized by periodic variations of electric and magnetic fields
59. Electron	a stable elementary particle that is negatively charged and orbits the nucleus of an atom
60. Element	a substance that cannot be reduced by chemical means
61. Energy	a quantity that describes the capacity to do work; a source of usable power
62. Energy Pyramid	diagram that compares the amount of energy available at each position, or level, in the feeding order
63. Energy Transfer	a change of energy from one form to another (e.g., mechanical to electrical, solar to electrical)
64. Entropy	a measure of randomness or disorder of a closed system

65. Environment	the sum of conditions affecting an organism, including all living and nonliving things in an area, such as plants, animal, water, soil, weather, land forms, and air
66. Equator	an imaginary circle around Earth's surface located between the poles and that divides the Northern and Southern Hemispheres
67. Erosion	the wearing away of Earth's surface by the breakdown and transportation of rock and soil
68. Evaporation	the process by which a liquid is converted to its vapor phase by heating the liquid
69. Experiment	a procedure that is carried out and repeated under controlled conditions in order to discover, demonstrate, or test, a hypothesis; includes all components of the scientific method
70. Fault	a rock fracture along which movement or displacement of Earth's crust has taken place
71. First Law of Thermodynamics	states the internal energy in a system remains constant and the change in thermal energy of a system is equal to the work done on the system
72. Food Chain	transfer of energy through various stages as a result of feeding patterns of a series of organisms
73. Food Web (cycle)	the interconnected feeding relationships in a food chain found in a particular place and time
74. Force	a quality that tends to produce movement or acceleration of a body on the direction of its application; a push or pull
75. Fossil	a whole or part of a plant or animal that has been preserved in sedimentary rock
76. Fossil Fuels	the remains of animals or plant from past geologic ages that are now in a form suitable for use as an energy resource (e.g., oil, coal, or natural gas)
77. Frequency	the number of cycles or waves per unit time
78. Friction	a force that opposes the relative motion of two material surfaces in contact with one another

79. Fulcrum	the pivot point of a lever
80. Galaxy	a large collection of stars, gases, and dust that are part of the universe bound together by gravitational forces
81. Gas	one of the fundamental states of matter in which the molecules do not have a fixed volume or shape
82. Gene	a specific part of a chromosome or sequence of DNA that determines a particular feature or characteristic in an organism
83. Genotype	the sum total of the genetic information contained in an organism
84. Gravitation	a force of attraction between two masses
85. Gravity	the observed affect of the force of gravitation
86. Habitat	a place in an ecosystem where an organism normally lives
87. Half-Life	the amount of time required for half of an original sample of radioactive material to decay or undergo radioactive transformation
88. Heat	a form of energy resulting from the temperature difference between a system and its surroundings
89. Heat of Fusion	the amount of heat energy required to convert a unit mass of substance from a solid to a liquid through melting at a constant temperature and pressure
90. Heat of Vaporization	the amount of heat energy needed to change a unit mass of substance from a liquid to as gas at its boiling point
91. Herbivore	an animal that feeds on plants
92. Heterozygous	cell or organism that has two different alleles for a particular trait
93. Homozygous	cell or organism that has identical alleles for a particular trait
94. Igneous Rock	It is formed from molten or partly molten material that cools and hardens
95. Inclined Plane	a type of simple machine; a slanted surface that makes it easier to move a mass from a lower point to a higher point

96. Independent/ Manipulated Variable	the factor that is changed in an experiment in order study changes in the dependent (responding) variable
97. Indicator	a chemical compound that changes color depending on the pH of the solution or other chemical change
98. Inertia	the property of an object, due to its mass, by which it resists any change in its position unless overcome by force
99. Investigation	a procedure that is carried out in order to observe a response caused by a stimulus; not a complete experiment
100. Isotope	the form of an element with the same number of protons but a different number of neutrons
101. Kelvin	fundamental SI unit of temperature where zero degrees is equal to absolute zero
102. Kinetic Energy	the energy possessed by a body because of its motion
103. Lever	a type of simple machine; consists of a rigid bar that pivots about a fulcrum, used to transmit and enhance power or motion
104. Life-Cycle	the entire sequence of event's in an organism's growth and development
105. Light	electromagnetic radiation that lies within the visible range
106. Liquid	one of the fundamental states of matter with a definite volume but no definite shape
107. Magnetic	having the property of attracting iron and certain other materials by virtue of a surrounding field of force
108. Magnetic Field	the region where magnetic force exists around magnets or electric currents
109. Mass	the amount of matter an object contains
110. Mass Number	the total protons and neutrons in a nucleus
111. Matter	a solid, liquid, or gas that possesses inertia and is capable of occupying space

112. Meiosis	the process of nuclear division in cells during which the number of chromosomes is reduced by half
113. Membrane	a thin layer of tissue that surrounds or lines a cell, a group of cells, or a cavity; any barrier separating two fluids
114. Metamorphic Rock	forms because of extreme changes caused by heat, pressure, or chemical environments
115. Microscopic	relating to an object too small to be visible without the use of an instrument used for enlargement
116. Mid-Ocean Ridge	a continuous, seismic mountain range extending across the floor of the world's major oceans; area where two oceanic plates are moving away from each other releasing new crustal material
117. Mitosis	a process of nuclear division in eukaryotic cells during which the nucleus of a cell divides into two nuclei, each with the same number of chromosomes
118. Mixture	the product of a thorough blending of two or more substances, not chemically combined
119. Molecule	the smallest unit of matter of a substance that retains all the physical and chemical properties of that substance; consists of a single atom or a group of atoms bonded together
120. Momentum	a vector quantity that is the product of an object's mass and velocity; the general effect of ongoing motion
121. Moon	a natural satellite that revolves around a planet
122. Moon Phase	indicates the fraction of the Moon's disc that is illuminated as seen from Earth
123. Mutation	the process by which a gene undergoes a change in DNA sequence or a structural change
124. Natural Selection	the theory stating every organism displays slight variations from other organisms of its kind, and the struggle for limited natural resources results in individuals with certain natural variations adapted to their specific environments

125. Neap Tide	periodic rise and fall of sea-level that occurs twice-monthly when the Sun, Moon, and Earth are at right angles to each other
126. Neutral	a particle, object, or system with no a net charge
127. Neutron	a subatomic particle having zero charge, found in the nucleus of an atom
128. Niche	the unique position (job) of a species in terms of the area it inhabits and the function it performs within the community
129. Nonrenewable Resource	a substance & or material that can only be replenished over millions of years; cannot be reused (i.e., fossil fuels)
130. Nuclear Fission	the process by which an atomic nucleus splits into two or more large fragments, producing vast amounts of energy and additional neutrons
131. Nuclear Fusion	the process by which two lighter atomic nuclei combine at extremely high temperatures to release vast amounts of energy and form a heavier nucleus
132. Nucleus	a cell structure that contains the cell's genetic material; also the center region of an atom where protons and neutrons are located
133. Ocean Basin	a depression on the surface of Earth occupied by water
134. Organ	a structure containing different tissues that are organized to carry out a specific function of the body
135. Organism	any living thing that shows the characteristics necessary for life
136. Permeability	the capability of a porous substance or membrane to allow a fluid or gas to enter it
137. pH	a symbol for the measure of the acidity (acid) or alkalinity (base) of a solution
138. Phenotype	the physical characteristic of an organism resulting from the interaction of its genetic makeup and its environment

139. Photosynthesis	a chemical process by which plants trap light energy to convert carbon dioxide and water into carbohydrates (sugars)
140. Physical Change	a reaction; a change in matter from one form to another, without forming new substances
141. Planet	a large body in space that orbits a star and does not produce light of its own
142. Plate Tectonics	theory in which Earth's crust is divided into sections whose movements cause seismic activity (i.e., earthquakes, volcanoes) along their borders
143. Pollution	any alternation of the natural environment producing a condition harmful to living organisms; may occur naturally or as a result of human activities
144. Population	a group of organisms of the same species living in a specific geographical area
145. Potential Energy	stored energy; the energy an object has because of its position or structure
146. Precision	the degree of accuracy or exactness of a measurement or tool
147. Predator	an organism that preys on and eats animals; usually an animal
148. Pressure	the force exerted per unit area
149. Prey	an organism caught or hunted for food by another organism
150. Prism	a piece of glass that disperses a beam of white light into its component colors
151. Producer	an organism that makes its own food from the environment (by photosynthesis or chemosynthesis)
152. Product	a substance or compound resulting from a chemical reaction
153. Protein	a biological macromolecule composed of one or more chains of amino acids
154. Protist	unicellular organisms belonging to the Kingdom Protista

155. Proton	a subatomic particle having a positive charge and which is found in the nucleus of an atom
156. Pulley	a type of simple machine; circular lever used to change the direction of a force
157. Punnett Square	a graphic check board used to determine results from a particular genetic cross
158. Radiation	emission of energy in the form of rays or waves
159. Rate of Reaction	the speed of a given reaction
160. Reactant	any substance or molecule that participates in a chemical reaction
161. Recessive	an allele for a trait that will be masked unless the organism is homozygous for this trait
162. Reflection	the bouncing off of light, sound, or heat from a surface
163. Refraction	a change in the direction of a wave that occurs as it passes from one medium to another of different density
164. Renewable Resource	a material or substance that is replaced or restored, as it is used, by natural processes in a reasonable amount of time
165. Resource	any material that can be used to satisfy a need
166. Rift Valley	a long, narrow depression in Earth's crust where two continental plates are separating or between two faults
167. RNA	a single-stranded nucleic acid that encodes information needed to synthesize proteins
168. Scientific Method	a plan of inquiry that uses science process skills as tools to gather, organize, analyze, and communicate information
169. Screw	a type of simple machine that consists of an inclined plane wrapped around a cylinder
170. Second Law of Thermodynamics	states all natural processes proceed in a preferred direction (e.g., heat flows from high temperature regions to low temperature regions)

171. Sedimentary Rock	formed from layers of sediment that overlay and squeeze together or are chemically combined
172. Sexual Reproduction	involves the union of gametes producing an offspring with traits from both parents
173. Solar Mass	the quantity equal to the amount of matter of the Sun
174. Solar System	a star and all planets and other bodies that orbit it; the region in space where these bodies move
175. Solid	having a definite shape and a definite volume; one of the fundamental states of matter
176. Solubility	the ability or tendency of one substance to dissolve in another at a given temperature and pressure
177. Solution	a mixture of two or more substances uniformly dispersed throughout a single phase
178. Species	a group of organisms of common ancestry able to reproduce only among themselves and usually geographically distinct
179. Spectroscope	an instrument that uses a prism to separate and catalog light wavelengths
180. Speed	amount of distance traveled divided by time taken; the time-rate at which any physical process takes place
181. Spring Tide	increased range of the rise and fall of sea level that occurs twice monthly at when the Earth, moon and sun are aligned
182. Star	a large, self-luminous body held together by gravity and powered by thermonuclear reactions
183. Stimulus	a condition that produces a response
184. Succession	the progressive replacement, on a single site, of one type of community by another
185. Sun	the closest star to Earth and the center of our solar system
186. System	a set of objects, organisms, or different parts acting to form a whole

187. Thermal Energy	internal energy found by adding the kinetic energy of particles making up a substance
188. Tissue	similar cells acting to perform a specific function; four basic types are muscle, connective, nerve, and epidermal
189. Topography	the surface, shape, and composition of a land area
190. Tropism	the motion of an organism or part of an organism toward or away from an external stimulus
191. Trough	the lowest point on a wave
192. Universe	the total sum of all matter and energy that exists
193. Variable	an event, condition, or factor that can be changed or controlled in order to study or test a hypothesis in a scientific experiment
194. Vector	a physical quantity with both a magnitude and direction; an animal that carries a disease-causing organism from host to host
195. Velocity	the time rate at which a body changes its position vector; quantity whose magnitude is expressed in units of distance over time
196. Vibration	a repetitive movement around an equilibrium point
197. Virus	a non-cellular, disease-causing particle that uses the genetic material from its host to reproduce
198. Volcano	a vent or fissure in Earth's surface through which magma and its associated materials are expelled
199. Volume	a measure of the amount of space an object takes up
200. Water Cycle	the path it takes as it is being cycled through the environment, including condensation, evaporation, and precipitation
201. Wavelength	the distance between crests of a wave
202. Weathering	the natural processes that break down and change rock into soil, sand, and other materials

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| 203. Wedge | a type of simple machine that consists of an inclined plane used to separate two objects |
| 204. Wheel and Axle | a type of simple machine, a circular frame or disk revolving around a central axis |

FCAT Science Vocabulary Word Bank

Abiotic	Crust	Habitat
Acceleration	Decomposer	Half-life
Accuracy	Density	Heat
Acid	Dependent Variable	Heat of Fusion
Activation Energy	Deposition	Heat of Vaporization
Adaptation	Diffraction	Herbivore
Air Resistance	DNA	Heterozygous
Allele	Dominance	Homozygous
Amino Acids	Earthquake	Igneous Rock
Amplitude	Ecosystem	Inclined Plane
Aqueous	Efficiency	Independent Variable
Asexual Reproduction	Electromagnet	Indicator
Astronomical Unit	Electromagnetic	Inertia
Atmosphere	Radiation	Investigation
Atom	Electromagnetic Waves	Isotope
Atomic Number	Electron	Kelvin
Axis	Element	Kinetic Energy
Base	Energy	Lever
Biodiversity	Energy Pyramid	Life Cycle
Biome	Energy Transfer	Light
Biotic	Entropy	Liquid
Calorie	Environment	Magnetic
Carnivore	Equator	Magnetic Field
Catalyst	Erosion	Mass
Centrifugal Force	Evaporation	Mass Number
Centripetal Force	Experiment	Matter
Change of State	Fault	Meiosis
Chemical Change	First Law of	Membrane
Chemical Weathering	Thermodynamics	Metamorphic Rock
Circuit	Food Chain	Microscopic
Community	Food Web or Food	Mid-ocean Ridge
Compound	Cycle	Mitosis
Concentration	Force	Mixture
Condensation	Fossil	Molecule
Conduction	Fossil Fuels	Momentum
Conservation	Frequency	Moon
Conservation of Energy	Friction	Moon Phase
Conservation of Mass	Fulcrum	Mutation
Constellation	Galaxy	Natural Selection
Consumer	Gas	Neap Tide
Convection	Gene	Neutral
Convergent Boundary	Genotype	Neutron
Covalent Bond	Gravitation	Niche
Crest	Gravity	

Nonrenewable
Resource
Nuclear Fission
Nuclear Fusion
Nucleus
Ocean Basin
Organ and Organism
Permeability
pH
Phenotype
Photosynthesis
Physical Change
Planet
Plate Tectonics
Pollution
Population
Potential Energy
Precision
Predator
Pressure
Prey
Prism
Producer
Product
Protein
Protist

Proton
Pulley
Punnett Square
Radiation
Rate of Reaction
Reactant
Recessive
Reflection
Refraction
Renewable Resource
Resource
Rift Valley
RNA
Scientific Method
Screw
Second Law of
Thermodynamics
Sedimentary Rock
Sexual Reproduction
Solar Mass
Solar System
Solid
Solubility
Solution
Species
Spectroscope

Speed
Spring Tide
Star
Stimulus
Succession
Sun System
Thermal Energy
Tissue
Topography
Tropism
Trough
Universe
Variable
Vector
Velocity
Vibration
Virus
Volcano
Volume
Water Cycle
Wavelength
Weathering
Wedge
Wheel and Axle

FCAT Science Vocabulary Basketball Rules



Directions:

1. Divide the class into 2 equal teams.
2. Use the large garbage cans for the basket when using regulation size ball.
3. Spaces will be marked where the student will shoot for a field goal and a three point shot. The student has to be behind the line to shoot.
4. The teacher will ask one student at a time if they want a field goal or a three point shot.
5. A field goal means the student can correctly answer one vocabulary question. A three point shot means the student can answer two questions in a row correctly.
6. A correct answer or series of answers allows that team member to shoot the basketball for an extra point.
7. For example, if a student asks for a field goal and answers correctly, he/she will be allowed to shoot the basketball from the marked spot to complete the play. **The shooter is allowed to shoot the ball 2 times to try to make the basket.** If the shot is made the team will be given an extra 2 points, for a total of 4 points.
8. A three point play will consist of two correctly answered questions and a shot from a farther distance. If the two questions are answered correctly but the shot is missed, the team will only be awarded 4 points. If the shot is made, the team is awarded 4 points plus an extra 3 points for making the shot for a total of 7 points.
9. If a student answers incorrectly, no points are awarded and the ball goes to the other team.
10. Once one player is finished, a player on the other team goes next.
11. Although basketball is a team sport, no one can help the student who has possession of the basketball. If another student calls out an answer, possession goes to the other team and that student is disqualified and given a book assignment
12. For the last play of the game, the team is allowed to pick anyone on their team to answer the questions and they can pick anyone on their team to take the shots if it is answered correctly.
13. The team that has scored the most points at the end of the game is the winner.
14. This game is best played the last 30-45 minutes of class.
15. The team that wins is awarded a jolly rancher candy and/or an extra credit point.
16. This game can also be used to review for a test.

FCAT Science Vocabulary Baseball Rules



Directions:

1. Divide the class into 2 equal teams.
 2. Make a baseball diamond on the board along with an area to indicate outs and runs scored. Also, a laminated baseball field can be ordered from the Teacher's Discovery Science Catalog.
 3. The teacher will ask one student at a time if they want a single, double, triple or home run. That student is "up to bat".
 4. A single means that the student will be able to define one vocabulary word correctly, a double would be two in a row, a triple, 3 in a row, and a home run would be four in a row.
 5. If a student answers incorrectly, it will count as one out and then go on to the next student. If a student has decided to go for a double, triple, or home run, if at any time they answer a question incorrectly, they are out.
 6. No one can help a student who is "up to bat". If another student calls out an answer, it is an out for their team and that student is then given a book assignment and is out of the game.
 7. If a student successfully answers the question/questions asked, mark a runner on the appropriate base.
 8. The real rules of baseball are used to move runners and score runs.
 9. Once a team has accumulated 3 outs, it is now the other teams' turn.
 10. Be sure that each team has been given the same number of times up to bat.
 11. The team that has scored the most runs at the end of the game is the winner.
 12. This game is best played the last 30 minutes of class.
 13. If a student successfully completes a home run, I give that person an extra credit point and a jolly rancher candy.
 14. The team that wins, I give each team member a jolly rancher candy and/or an extra credit point.
 15. This game can also be used to review for a test.
- If you do not know how to play baseball yourself, you might consider just offering a single and skip the idea of offering a double, triple, or home run.



FCAT Science Vocabulary Beach Ball Game

Objective: Test student's knowledge of the vocabulary words and to have FUN!

Materials: 8 Beach balls per class (they can be purchased at most Dollar Stores)
8 Sharpie pens

Directions:

1. Assign 12 different vocabulary words to each group.
2. Each group will have one beach ball and a sharpie.
3. Determine which person has the best handwriting.
4. Neatly write the definitions of the 12 vocabulary words on different areas of the ball. Allow the sharpie ink to dry.
5. Once the balls are made, chose one or more balls to play with that period.
6. One person throws the ball to another student in a different group. The student that catches the ball looks to see where their right thumb is touching. They read the definition that their right thumb is touching.
7. The group that has the ball has 15 seconds to discuss the answer.
8. The person who caught the ball gives the answer.
9. Then that team throws the ball to another person in a different group.
10. Each time a group answers a vocabulary definition correctly, they receive 1 point.
11. After every team has had a turn, the second round will receive 2 points for each correct answer. If there is time for a third round, 3 points will be awarded for a correct answer.
12. Ask the students to throw the ball to a different person in each group each round.
13. The team that scores the most points will win.
14. This game is best played the last 30-45 minutes of class.
15. The team that wins, I give each team member a jolly rancher candy and/or an extra credit point.

* This game can also be used to review for a test.



Beach Ball-Hot Potato

Objective: To reinforce information that has been taught in a fun & creative manner. Used as a test review for either Science FCAT Vocabulary words or for any test review.

Materials: 3 beach balls, a set of 6 cards w/ colors & point values for each color, one whistle

Directions:

1. Divide the class into 3 groups, each group occupying one section of the room.
2. Each team will get one beach ball.
3. When the whistle is blown by the teacher, each team will hand the beach ball to each other. If the team is in rows, they will pass it back the row and then back up. If the team is in a circle, pass it around the circle.
4. When the whistle is blown again, whoever has the beach ball will be asked what color is their left thumb on.
5. That color is written on the board for that team.
6. Once all 3 teams have indicated their color, the teacher will pick one of 6 cards that are face down. That card will indicate the point value for that color.
7. The teacher will then ask each person who has the ball one question. If it is answered by that person correctly, the team will receive the point value for their color. The rest of the team cannot help with the answer, only the person with the ball can answer.
8. Repeat steps #3 through #7, making sure that when the whistle is blown that a different student ends up with the ball and that a different card is drawn so the color point value continues to change.
9. Play as many rounds as deemed appropriate and then add up the score. You could consider playing the last round for double points so that the last place team could have a chance of winning at the end.
10. This game is best played the last 30-45 minutes of class.
11. For the team that wins, each team member can be given a jolly rancher candy and or an extra credit point.

Beach Ball Hot Potato Cards

Red	1	Red	4
Green	2	Green	5
White	3	White	6
Blue/Purple	4	Blue/Purple	1
Orange	5	Orange	2
Yellow	6	Yellow	3
Red	2	Red	5
Green	3	Green	6
White	4	White	1
Blue/Purple	5	Blue/Purple	2
Orange	6	Orange	3
Yellow	1	Yellow	4
Red	3	Red	6
Green	4	Green	1
White	5	White	2
Blue/Purple	6	Blue/Purple	3
Orange	1	Orange	4
Yellow	2	Yellow	5

Science FCAT Vocabulary BINGO

This is the website to create Bingo cards with the vocabulary words. Twenty-four words plus a free space are used for each set. A class set of cards has to be generated.

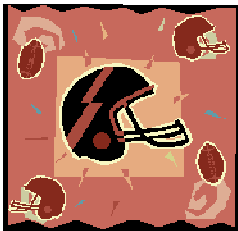
http://teachers.teach-nology.com/web_tools/materials/bingo/

Bingo is a game that should be used once the students already have a good understanding of the definitions. Once the class has already played baseball, basketball, beach ball, or football, then it would be appropriate to play bingo.

Sample FCAT Bingo Card: 1-25

abiotic	amplitude	aqueous	calorie	biodiversity
acceleration	amino acids	atomic number	astronomical unit	catalyst
accuracy	allele	biotic	base	centrifugal
acid	air resistance	asexual reproduction	carnivore	biome
activation energy	adaptation	axis	atmosphere	atom





FCAT Science Vocabulary Football

(Revised-5/06) Adapted from Teacher's Discovery

Objective: Test student's knowledge of the vocabulary words and to have FUN!

Directions:

1. Out of a sheet of poster board, make a football field and laminate it or a football field can be ordered from the Teacher's Discovery Science Catalog.
2. Using poster board, make 2 inch footballs of your favorite 6 teams. Have them laminated.
3. Use magnets to hold the footballs to the playing field and the playing field on to the white board.
4. Divide the class into six teams of five.
5. Assign a team to each group.
6. Each team selects a captain and someone to move their football. Each team begins with a tip of the football on the goal line.
7. The teacher will determine which team to begin with.
8. The team will have 15 seconds to determine if they want 1, 2, 3, or 4 vocabulary words to identify. Each word that is defined correctly equals 10 yards. If the team asks for 3 words, answers 2 correctly but misses the third, the team does not move at all. If they answer all 3 words correctly, the team moves 30 yards.
9. The team will have 15 seconds to discuss the answer to the vocabulary definition given. The captain then will identify the word.
10. For the last round, each individual on the team must answer one question without the help of anyone else on the team. This helps to break any ties that might exist.
11. If another team is talking when it is not their turn, they move back 5 yards.
12. The team that reaches the end zone first will win the game. However, every team will receive an equal number of turns to answer questions.
13. This game is best played the last 30-45 minutes. of class
14. The team that wins, each team member is receives a jolly rancher candy and an extra credit point.
16. This game can also be used to review for a test.

FCAT Science Scrabble

Materials: 1 scrabble game for each group of four students
FCAT Science Word and Definition Lists

Directions:

1. Students are to be put randomly into groups of 3.
2. Each group is given one scrabble game.
3. The group will play scrabble following the same rules of the game with two exceptions, each time they use a science FCAT word, the player will receive double points. Additionally, each person will begin with 9 tiles rather than 7. This will allow students to be able to spell more of the Science FCAT words.
4. Pre-determine the amount of time the game will be played.
5. At the end of the time, there will be two ways to determine winners for each **group**:
 - a. Whoever has accumulated the most points will be given a jolly rancher candy.
 - b. Whoever used the most Science FCAT words will be given extra credit & a jolly rancher candy.
6. There will be one way to determine a winner for each **class**:
 - a. Whoever has accumulated the most points will get additional extra credit & another jolly rancher candy.

The winners could be given extra credit and/or a prize (pencil, book mark, candy, etc...)

FCAT Game Order Information

Teacher's Discovery – Science Supply Catalog

Phone: 1-888-977-2436

Fax: 1-888-987-2436

Email: science@teachers-discovery.com

Physics Baseball #SPG2G5 \$26.95

Biology Football #SGG26G5 \$26.95

Fisher

Phone: 1-800-955-1177

Email: www.fisheredu.com

Magnets to secure game boards & pieces

Super Holding Magnets Block#AJS79508A

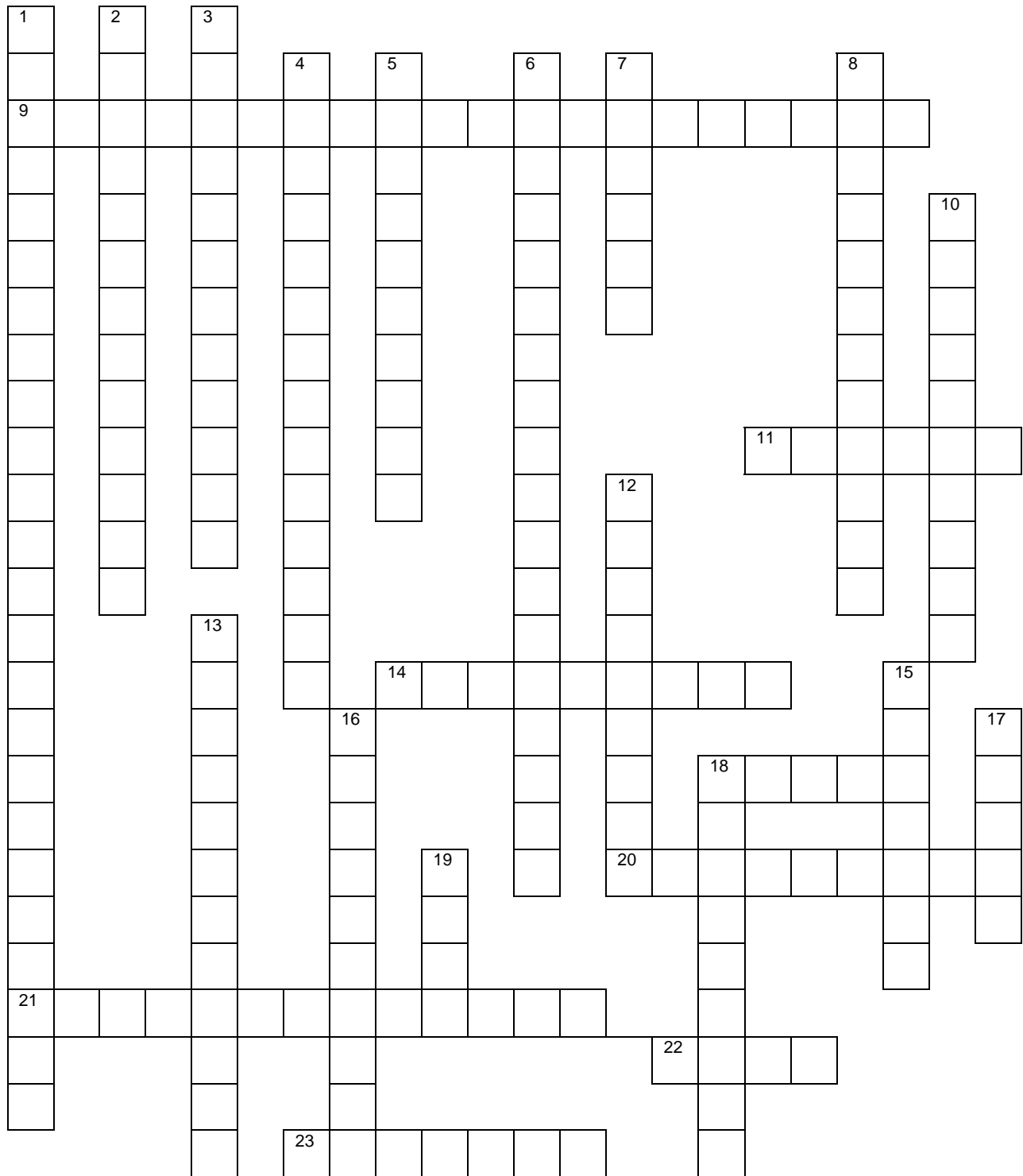
For the FCAT Basketball Game - it is advised to buy a basketball hoop that goes over the door or use a small basketball and a trash can.

For the FCAT Bingo Game - an actual Bingo spinner with balls can be purchased.

For FCAT Beach Ball Games - the beach balls can be purchased at "Big Lots" or a "Dollar Store".

For Scrabble Games - any store that sells board games

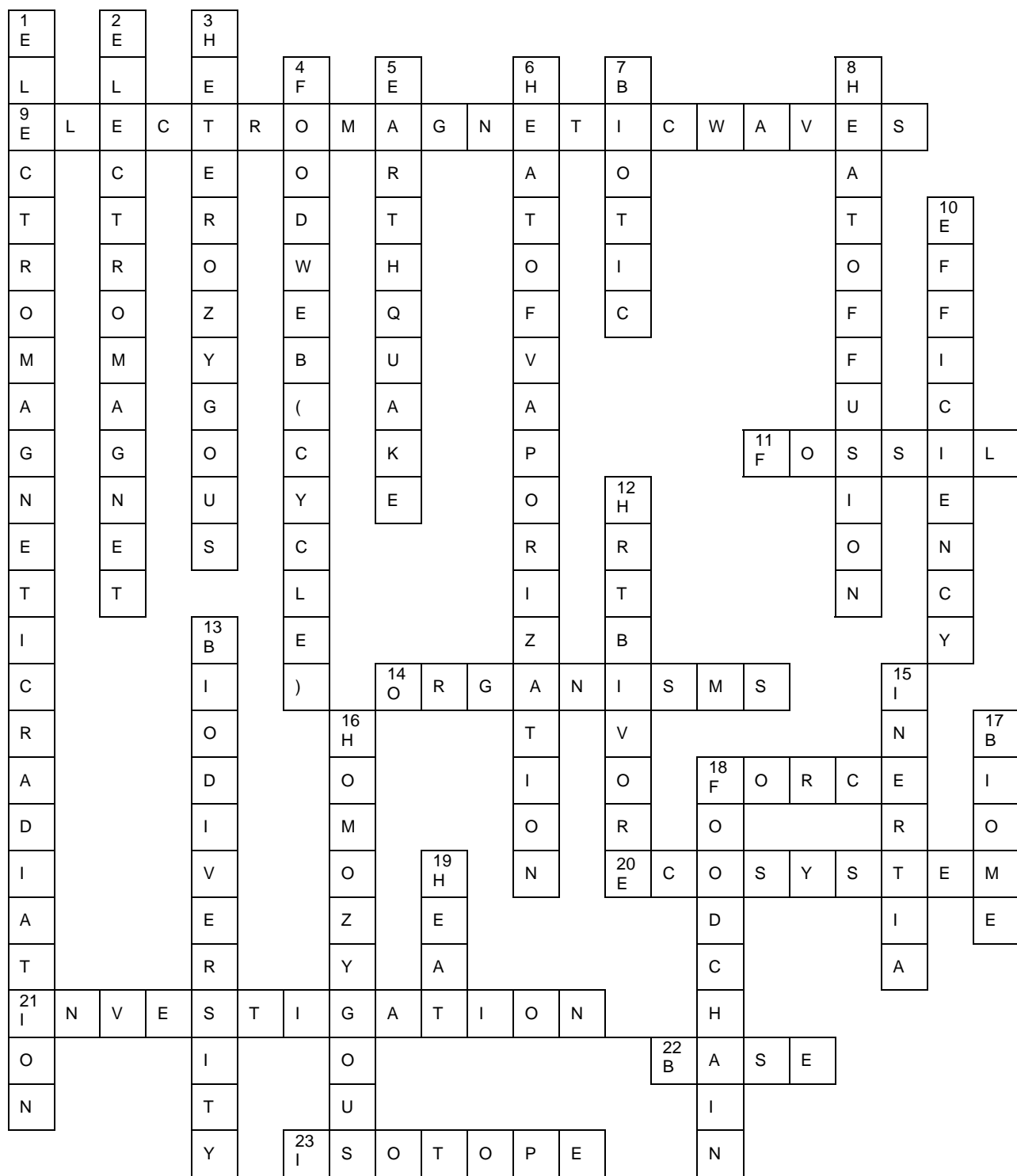
FCAT Vocabulary (1-100) Crossword Puzzle



FCAT Vocabulary (1-100) Clues

CLUES ACROSS		CLUES DOWN	
9	Generated by the oscillation of a charged particle	1	The emission of the entire range of electromagnetic
11	A whole or part of a plant or animal that has been preserved in sedimentary rock	2	Consisting of a coil and wire wrapped around a core; becomes strongly
14	Any living thing that shows the characteristics necessary for life	3	magnetized when current flows through the coil producing a magnetic field
18	A quality that tends to produce movement or acceleration of a body on the direction of its application; a push or pull	4.	The interconnected feeding relationships in a food chain found in a particular place and time
20	An ecological community, together with its environment, functioning as a unit	5	The shaking of the ground caused by a sudden release of energy in the Earth's crust
21	A procedure that is carried out in order to observe a response cause by a stimulus; not a complete experiment	6	The amount of heat energy needed to change a unit mass of substance from a liquid to a gas at its boiling point
22	A substance that increases the OH-concentration of a solution; a proton acceptor	7	Factors in an environment relating to living
23	The form of an element with the same number of protons but a different number of neutrons	8	The amount of heat energy required to convert a unit mass of substance from a solid to a liquid through melting at a constant temperature and pressure
		10	The relative effectiveness of a system or device determined by comparing input and output
		12	An animal that feeds on plants
		13	The existence of different species in a given area or specific period of time
		15	The property of an object, due to its mass, by which it resists any change in its position unless overcome by force
		16	Cell or organism that has identical rather than different alleles for a particular trait
		17	A community characterized by the interactions of living organisms and climate factors
		18	Transfer of energy through various stages as a result of feeding patterns of a series of organisms
		19	A form of energy resulting from the temperature difference between a system and its surroundings

FCAT Vocabulary (1-100) Key



Note:

The website to make the crossword puzzles using the FCAT Science words:

<http://www.greenclipsesoftware.com/eclipsecrossword/download.html>

When using this website, one can make a variety of crossword puzzles. It is recommended to use twenty-five words from at least a pool of 100 words otherwise it will not be challenging to the students. It is also recommended that a puzzle could be created from words by subject as well as an alpha list of words. For example, create a puzzle using only biology words or physical science words. On the following pages is an example of a puzzle using the first 100 science FCAT words. Encourage students to create their own crossword puzzles and other word games.

Science FCAT Vocabulary Hunt



Objective:

- Students will become familiar with Science FCAT vocabulary terms by reading newspapers and or magazines.

Assignment:

- It is a requirement for all students to individually participate.
- It will be worth **12 grades**.
- Each student will have two months to search for the FCAT Science words however; it will be collected once a month for six grades each month. **A minimum number of words will be required for each month for a passing grade.**
- It must be submitted in a folder with a clear front.
- It must have a title page that includes the name of the project, a colored graphic or design that relates to the topic, along with your name, date, and class period.
- There will be some opportunities to use class time to search through newspapers/magazines for words. The majority of the hunt will be done on your own time.
- **Only newspapers and magazines are allowed as resources. (NO INTERNET, NO XEROX COPIES, NO BOOKS, new or old)**
- Ask family members & friends for their old magazines. **DO NOT CUT ANY SENTENCES FROM A MAGAZINE THAT IS NOT YOUR OWN. The owner must give you the magazine to cut it.**

Directions:

1. Students will search magazines and newspapers to find the Science FCAT vocabulary terms.
2. Once a word is found, cut out the entire sentence containing the vocabulary word.
3. The term must be highlighted in the sentence.
4. Paste or tape (no staples) the sentence to a blank sheet of paper.
5. The vocabulary word must be written & highlighted underneath accompanied by its science definition.
6. A different form of the word may be used. For example; adapt may be used for adaptation.
7. It is ok to use a word that does not have the same science definition as long as you follow the required directions to write the word and science definition underneath the sentence from the newspaper or magazine. For example, you may find the word base in the sports section, the batter ran the bases. That sentence can be used with the word base highlighted.

8. It is allowed to trade words with other students. For example, if you have found the word acid twice, you may trade one of them with someone who has found a word that you do not have.
9. Anyone caught cutting a magazine that is not theirs to do so will result in an automatic twelve Fs for the project.
10. At the end of the designated period the teacher will collect a single folder from each student containing all of the words that were found.
11. Extra credit and prizes will be awarded to the top 10 students in all six classes who correctly find the most Science FCAT Vocabulary Words. Special prizes and awards will be given to the top three students as well as the #1 student who finds the most words.

Order for Folder:

1. Title Page
2. Science FCAT Vocabulary Word Bank with words found highlighted
3. Pasted, glued, or taped sentences containing the vocabulary words along with the vocabulary word (highlighted) and definition written directly below the cut out sentence.

STUDENTS: BE SURE TO FOLLOW THE DIRECTIONS!!! You do not want to lose points!

- **Missing Alpha FCAT Vocabulary highlighted list = DROPS 2 GRADES**
- **Missing clear folder = -5 points**
- **Missing Title Page = -5 points**
- **Missing colored graphic/design = - 3 points**
- **Missing color on the graphic = -2 points**
- **Missing definitions of word found= ½ credit for each missing definition**
- **Missing the highlighted vocabulary word before the definition = -2 points**
- **Did not highlight the vocabulary word before writing the definition= -1 pt.**

Science FCAT Vocabulary Hunt Grading Sheet

To assist with grading the Science FCAT Vocabulary Hunt, it is recommended that students used the alpha word bank, highlighting each word as they find them. For each sentence that contains an FCAT word, the teacher would check off the highlighted word. This ensures three factors. First, it ensures that the word indicated is indeed an FCAT word. Secondly, it ensures that the students have not repeated a word. Thirdly, having the words in an alpha list ensures a speedy and efficient method of grading.

Listed on the following pages is something I use to keep a record of how many words all of the students were able to find in a given period of time. This record can be used to set a class curve.

(Note: In the past two years, the most words that were found by a student were 187.)

Science FCAT Vocabulary Hunt Grading Sheet

1	23	45	67
2	24	46	68
3	25	47	69
4	26	48	70
5	27	49	71
6	28	50	72
7	29	51	73
8	30	52	74
9	31	53	75
10	32	54	76
11	33	55	77
12	34	56	78
13	35	57	79
14	36	58	80
15	37	59	81
16	38	60	82
17	39	61	83
18	40	62	84
19	41	63	85
20	42	64	86
21	43	65	87
22	44	66	88

89	105	121	137
90	106	122	138
91	107	123	139
92	108	124	140
93	109	125	141
94	110	126	142
95	111	127	143
96	112	128	144
97	113	129	145
98	114	130	146
99	115	131	147
100	116	132	148
101	117	133	149
102	118	134	150
103	119	135	
104	120	136	

FCAT Vocabulary Hunt Awards

Awards can vary depending on what items you are able to get donated or have available. It can also vary depending on the amount of time the students are given to complete this activity. Below is listed an example of what was done last year.

Top 3 Students in Each Class

- #1 Decorated bag which includes: candy bar, blow pop, bookmark. 2 pencils, 2 pens, highlighter, stress ball, a free Current Events pass, extra credit "A" and a disc.
- #2 Decorated Bag which includes: air head, bookmark. 2 pencils, 2 pens, and disc extra credit $\sqrt{+}$ $\sqrt{+}$
- #3 Decorated Bag which includes: candy, bookmark. 2 pencils, 2 pens, & disc extra credit $\sqrt{+}$

Top 5 Students In All Six Classes

- Colored certificate
- highlighter
- 1 Skittles and 1 Candy Bar
- Free Current Event Pass – automatic "A"
- \$5.00 Gift Card from Blockbusters
- Environmental stickers
- Frisbee
- Mouse pad
- Thermos drink cup
- Ruler
- Stress ball
- Bayside coupon book
- Canvas bag to hold all of the above merchandise

Top 1 Student in all Six Classes (in addition to what the top 5 received)

- \$15.00 Gift Certificate to Best Buy instead of the \$5 Blockbuster card
- Gift from the PTSA (\$15.00 value)
- #1 blue ribbon and #1 keychain
- Extra Credit 2 "As"
- Phone card – 500 minutes
- Free pass into the Holiday Village @ International Mall
- Free pass for 2 to see a movie preview

Dr. Michael M. Krop Senior High School

Proudly Acknowledges

For outstanding academic achievement in
Science FCAT Vocabulary Hunt

Mrs. D. Nunn - Teacher

Newspapers/Magazines Science Vocabulary Uses

In many schools, newspapers are used by various departments throughout the year. It can be communicated to those departments that once they are finished with the newspapers to send them to you. Once enough are accumulated, they can be used by your students to search for Science FCAT words for the Vocabulary Hunt activity.

At the end of each year, the school library must dispose of old magazines. At this time, you should go to the library and claim as many as possible. Then they can be used to hunt for Science FCAT words. It has been observed many times that while students are searching for a word, they become interested in an article and read something they never would have read otherwise.

Newspapers/magazines can be used for the last 30 minutes of a period by the entire class or whenever a student finishes their class work early. Newspapers/magazines could also be given away to the first 3 students to get to class each period on various days or at 7:15 in the morning when students are first admitted into the building.

Current Science Magazines Science FCAT Vocabulary Uses

Throughout the school year, Current Science magazines will be utilized to increase and reinforce science vocabulary words as well as increasing reading & comprehension skills. Each issue includes articles on life science, health science, physical science, earth science, new discoveries and mystery photos.

A variety of reading strategies will be used to read and discuss the various articles. Each time one of the FCAT vocabulary terms are used, ask a student to describe its meaning or have students try to find as many FCAT Science vocabulary words are in each issue. These articles reinforce what is being taught throughout the year.

Additionally, many of the articles are about topics that are referred to on the Science FCAT Test. It is written in a very creative yet informative manner which the students get excited about. They are having fun learning. They really enjoy trying to figure out the mystery photos and reading about new discoveries.

Another time that these magazines can be used is when a test and or an assignment are given. As students turn in their tests/assignment, instead of sitting idle until everyone is finished, they can get a Current Science magazine and read.

Current Science magazines cannot be used for the Science FCAT Vocabulary Hunt. These are class sets that can be used by multiple teachers throughout the year and should not be cut. Magazines that are more than one year old that have been given away from the library can be used for the hunt.

FCAT Science Vocabulary
Test #1 - #25 Test A

Part 1: Matching: Bubble in the correct answer on the scantron answer sheet.
Each answer will only be used once.

- | | |
|--------------------------|---|
| 1. Abiotic | a. force of air on moving objects |
| 2. Acceleration | b. new individuals are formed w/out the involvement of gametes |
| 3. Accuracy | c. an environmental factor not associated with living organisms |
| 4. Acid | d. a solution containing water |
| 5. Activation Energy | e. the least amount of energy required to start a particular chemical reaction |
| 6. Adaptation | ab. in any periodic function (a wave) the distance between the position of rest and the highest point of a wave. |
| 7. Air Resistance | ac. equal to velocity divided by time; rate of change in velocity, usually expressed in meters/second |
| 8. Allele | ad. an organic molecule that makes up proteins; proteins are synthesized |
| 9. Amino Acids | ae. a substance that increases the H ⁺ concentration when added to a water solution |
| 10. Amplitude | bc. the extent to which a measurement is near the standard or expected value |
| 11. Aqueous | bd. an alternate form of a gene that an organism may have for a particular trait |
| 12. Asexual Reproduction | be. a particular change in a population of organisms, in response to changes in the populations |

Turn the paper over for Part 2, #13 - #25

Part 2: Matching: Bubble in the correct answer on the scantron answer sheet. Each answer will only be used once.

- | | | | |
|-----|-------------------|-----|--|
| 13. | Astronomical Unit | a. | total protons in an atom's nucleus |
| 14. | Atmosphere | b. | a substance that speeds up or slows down the rate of a reaction |
| 15. | Atom | c. | a community characterized by the interaction of living organisms and climatic factors |
| 16. | Atomic Number | d. | the average distance from Earth to the sun, approximately 150 million kilometers |
| 17. | Axis | e. | an animal or plant that consumes or obtains nutrients from animals; a meat eater |
| 18. | Base | ab. | the layers of gas that surround Earth, other planets, or stars |
| 19. | Biodiversity | ac. | the amount of heat needed to raise one gram of water one degree Celcius at standard atmospheric pressure; a unit of energy |
| 20. | Biome | ad. | the imaginary line on which an object rotates (runs through Earth between the North and the South Pole) |
| 21. | Biotic | ae. | the smallest unit of matter |
| 22. | Calorie | bc. | the existence of different species in a given area or specific period of time |
| 23. | Carnivore | bd. | factors in an environment relating to living organisms |
| 24. | Catalyst | be. | a substance that increases the OH- concentration of a solution; a proton acceptor |
| 25. | Centrifugal | cd. | The motion pushing away from the center |

FCAT Science Vocabulary
Test #1 - #25 Test B

Part 1: Matching: Bubble in the correct answer on the scantron answer sheet. Each answer will only be used once.

- | | |
|--------------------------|---|
| 3. Acid | a. force of air on moving objects |
| 4. Allele | b. new individuals are formed w/out the involvement of gametes |
| 3. Amplitude | c. an environmental factor not associated with living organisms |
| 4. Abiotic | d. a solution containing water |
| 5. Aqueous | e. the least amount of energy required to start a particular chemical reaction |
| 6. Amino Acids | ab. in any periodic function (a wave) the distance between the position of rest and the highest point of a wave. |
| 7. Air Resistance | ac. equal to velocity divided by time; rate of change in velocity, usually expressed in meters/second |
| 8. Acceleration | ad. an organic molecule that makes up proteins; proteins are synthesized |
| 9. Adaptation | ae. a substance that increases the H ⁺ concentration when added to a water solution |
| 10. Accuracy | bc. the extent to which a measurement is near the standard or expected value |
| 11. Activation Energy | bd. an alternate form of a gene that an organism may have for a particular trait |
| 12. Asexual Reproduction | be. a particular change in a population of organisms, in response to changes in the populations |

Turn the paper over for Part 2, #13 - #25

Part 2: Matching: Bubble in the correct answer on the scantron answer sheet. Each answer will only be used once.

- | | | |
|-----------------------|-----|--|
| 13. Calorie | a. | total protons in an atom's nucleus |
| 14. Biotic | b. | a substance that speeds up or slows down the rate of a reaction |
| 15. Catalyst | c. | a community characterized by the interaction of living organisms and climatic factors |
| 16. Carnivore | d. | the average distance from Earth to the sun, approximately 150 million kilometers |
| 17. Base | e. | an animal or plant that consumes or obtains nutrients from animals; a meat eater |
| 18. Axis | ab. | the layers of gas that surround Earth, other planets, or stars |
| 19. Biodiversity | ac. | the amount of heat needed to raise one gram of water one degree Celcius at standard atmospheric pressure; a unit of energy |
| 20. Biome | ad. | the imaginary line on which an object rotates (runs through Earth between the North and the South Pole) |
| 21. Atmosphere | ae. | the smallest unit of matter |
| 22. Astronomical Unit | bc. | the existence of different species in a given area or specific period of time |
| 23. Atomic Number | bd. | factors in an environment relating to living organisms |
| 24. Atom | be. | a substance that increases the OH- concentration of a solution; a proton acceptor |
| 25. Centrifugal | cd. | the motion pushing away from the center or axis |