



Essential Vocabulary

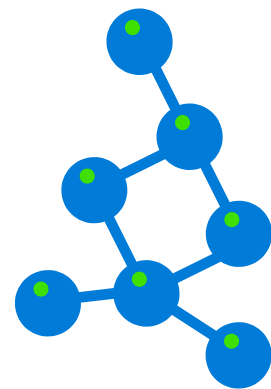
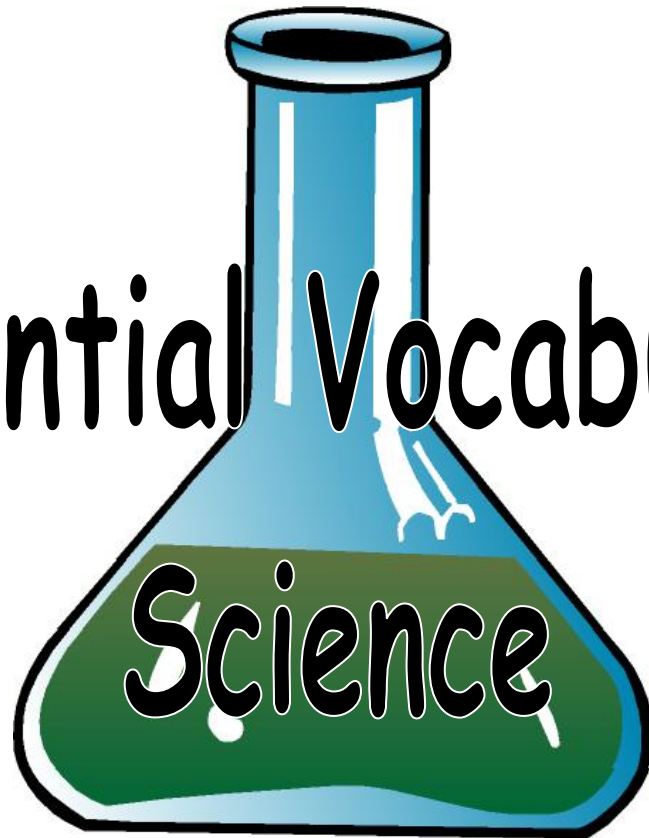


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Broward County Schools Essential Content Area Vocabulary

Introduction

" The gift of words is perhaps the most powerful gift you can give today's children. After all, the broader children's vocabularies, the more questions they can ask, thoughts they can share, and dreams they can express. Discovering the power of words truly opens the world to children and welcomes them to play a part."

Beck, McKeown, and Kucan, 2002

Purpose

Our purpose in creating this document was to develop a vocabulary resource for teachers in grades 6-8 Science. This essential vocabulary is needed for students to understand the key concepts taught throughout the curriculum. Words and phrases are taken from the District adopted basals, texts, and other instructional materials that students will encounter during the year. The words on the Essential Content Area Vocabulary List reflect the intention of the Sunshine State Standards and have been cross-referenced with Building Academic Vocabulary (2005) by Robert J. Marzano and Debra J. Pickering and key FCAT vocabulary.

These essential words have been arranged by grade and strand. It should be noted that this is not an exhaustive list and students will be exposed to many more words during their instruction.

Why this focus on vocabulary?

Researchers agree that there is a strong interaction between vocabulary, knowledge, and reading comprehension. Hirsch (2006), states that comprehending a text depends on knowing the meanings of most of its words. An adequate early vocabulary is, therefore, crucial for later reading achievement. Minskoff, in Teaching Reading to Struggling Learners, (2005), identifies four groups of students who have particular language difficulties which correlate to reading problems:

- Students with limited English language proficiency
- Students who speak dialects different than Standard American English
- Students from economically disadvantaged homes
- Students with language learning disabilities

As educators, we see these groups of students everyday.

The development of vocabulary knowledge begins at an early age as, "listening vocabulary". According to Stahl (1999), because most words are learned from context, good vocabulary instruction should simulate learning from context.

In the primary grades, this context is an oral one - teacher's saying these targeted words in a spoken context for student's to hear and begin to know. The research reminds us that long before children can comprehend through reading, progress in language occurs chiefly through listening and talking, not through reading and writing. The vocabulary listed for grades .3 are intended for the teacher to present orally.

Essential Content Area Vocabulary Continued

The focus at this level is not for students to be able to necessarily read or spell these words, but rather to know these concepts and their meanings. In the upper elementary grades, (Beck et al, 2002) states that in order for words to become a useful and permanent part of the student's vocabulary repertoire, multiple encounters with the vocabulary is required. Three key features in vocabulary instruction should be noted:

1. Frequent encounters with words
2. Rich, active instruction that goes beyond definitions. Encouraging students to not just use words, but explore the facets of word meaning and the relationships among words.
3. Extension of word use beyond the classroom taking notice of words within a greater environment.

According to Beck, McKeown, and Kucan (2002), in Bringing Words to Life, vocabulary work in middle and high school should allow deeper explorations of language - how language gives meaning and how words mean what they mean. Building understanding of language comes through developing knowledge of both the similarities and differences among words and the precise roles they can play.

At any grade level reading a lot seems to be the surest way to build a broad vocabulary. Twenty minutes of daily reading can potentially lead to learning at least one thousand words per year (Nagy, Anderson, and Herman 1987). However, Regie Routman in Conversations (2000), states if students read only very easy books, that is material "below the student's grade level of reading ability", vocabulary growth is likely to be minimal. Carver and Leibert (1955), suggest listening to challenging material that builds a student's background knowledge, may well be the most effective way to increase vocabulary.

The ability to define a word is really just the beginning of true word knowledge. The next steps are the ability to apply a word in different situations appropriately and recognize inappropriate uses as well, thereby demonstrating an understanding of the multiple meanings of words and the importance of the context in which they occur. Finally, to actually use a word in one's thinking, conversation, and writing is our ultimate goal in developing our students' vocabulary knowledge.

Earth Science Essential Vocabulary Grades 9-12

A. Nature of Matter	B. Energy	C. Force/Motion	D. Process/shape earth	E. Earth/Space	F	G	H. Nature/Science
abiotic* atomic mass* catalyst* chemical bond* chemical change* climatic pattern* density*** electron configuration* isotope* molecule** radiation** universal solvent*	elasticity* electromagnetic waves** entropy* endothermic reaction* exothermic reaction* conduction*** convection*** fossil fuel*** kinetic energy*** heat of fusion** heat of vaporization** laws of thermodynamics** magnitude magnetic energy nuclear energy** nonrenewable resources** potential energy** radiant energy renewable resources**	acceleration** amplitude** equilibrium deceleration* force** frequency friction** inertia*** momentum** refraction* torque* velocity** wavelength**	aquifer biosphere climate* continental drift continental shelf core crust** epicenter erosion*** fault fossil record* geochemical cycle* half-life** hydrosphere igneous rock** lithosphere* mantle* magna metamorphic rock** mid-ocean ridge** moh's scale pangea plate tectonics* relative dating rift valley rock cycle* sedimentary rock** sea floor spreading* sinkhole topography weathering**	asteroid * astronomy* astronomical distance* big bang theory* carbon cycle* comet* constellation eclipse equinox galaxy*** gravitational force** meteor impact* moon (lunar) phases*** nitrogen cycle* ozone satellite* solar system** star cycle* water cycle*			celsius control group data dependent variable** experimental group fahrenheit* hypothesis independent variable** kelvin*** qualitative data quantitative data research question* scientific method*** theory variable

* Word, phrases appear in multiple grade-levels

** Word may appear on FCAT test

(M) Word included on Marzano's word list

**Integrated Science
Grades 9-10**

Nature of Matter	Energy	Force and Motion	Nature of Science	Solar System	How Living Things Interact w/Their Environment	The Nature of Science
acid aqueous atom atomic number base catalyst chemical bond chemical equation chemical property compound concentration conservation of mass covalent bond density diffraction electron element half-life indicator ionic bond isotope mass number molecule nucleus neutron permeability ph physical property product proton rate of reaction reactant solubility	activation energy amplitude crest electromagnet electromagnetic waves first law of thermodynamics frequency heat of fusion hydroelectricity kinetic energy nuclear fission nuclear fusion radiation second law of thermodynamics temperature trough wavelength	acceleration centrifugal force centripetal force conductors circuit current force friction gravity inertia insulator machine magnetism mechanical advantage momentum newton's laws of motion power speed vector velocity	asthenosphere atmosphere climate conduction convection convergent boundary deposition divergent boundary earthquake el nino epicenter erosion fault fossil fuels geothermal energy hurricanes jet stream lithosphere magma mid-ocean ridge mineral processes that rift valley rock shape the earth soil tide troposphere volcano weathering	asteroids astronomical unit big bang theory comet constellation cosmology eclipse equinox galaxy light year meteoroid moon phase planets revolution rotation solar mass solstice	biosphere global warming greenhouse effect nonrenewable resource renewable resource	accuracy bias control dependent variable gps hypothesis independent variable kelvin law model precision technology variable

*words, phrases appear in multiple grade levels

**Indicates FCAT vocabulary

(M) included on Marzano's word list

**Biology Essential Vocabulary
Grades 9-11**

A Nature of Matter	B Energy	D Processes that Shape the Earth	F Processes of Life	G How Living Things Interact with Their Environment	H The Nature of Science
atom ** (m) molecule** (m) element compound** ion solution acid ** base** catalyst** (m) ionic bond covalent bond**	cellular respiration	pangea plate tectonics** (m) fossil record(m) gradualism reproductiv isolation paleontology (ist) vestigial structure homologous structure divergence coevolution	homeostasis(m) carbohydrates lipid protein**(m) amino acid** nucleic acid dna**(m) rna** atp enzyme(m) substrate active site passive transport concentration gradient osmosis diffusion hypertonic hypotonic isotonic receptor protein sodium-potassium pump photosynthesis(m) cellular respiration prokaryote eukaryote binary fission	autotroph heterotroph biotic** abiotic** biodiversity ecological succession** primary succession secondary succession pioneer species producer primary consumer secondary consumer trophic level food chain food web herbivore omnivore energy pyramid biomass biogeochemical cycles transpiration nitrogen cycle(m) nitrogen fixation combustion acid rain sulfuric acid	scientific method(m) observation hypothesis prediction ph** control group independent variable** dependent variable** theory light microscope electron microscope scanning tunneling microscope magnification resolution cell theory vaccine virulent transformation bacteriophage genetic engineering recombinant-dna restriction enzyme

Biology Essential Vocabulary Grades 9-11 continued

			<p>gamete chromosome gene(m) homologous chromosome(m) diploid haploid zygote autosome sex chromosome(m) karyotype mitosis**(m) meiosis**(m) allele** dominant trait/gene**(m) recessive trait/gene** (m) homozygous** heterozygous** genotype** phenotype law of segregation law of independent assortment punnett square** test cross pedigree sex-linked gene sex-linked trait(m) dna replication(m) transcription translation protein synthesis(m) rna polymerase messenger rna transfer rna</p>	<p>coal ozone(m) cfc fossil fuel**(m) global warming greenhouse effect greenhouse gas(m) biological magnification aquifer renewable resource nonrenewable resource biology gene heredity mutation** evolution** adaptation** charles darwin(m) ecology aerobic anaerobic glycolysis fermentation co2 population population size population density dispersion population model exponential growth curve carrying capacity factor</p>	<p>vector** plasmid gene cloning electrophoresis probe human genome project dna fingerprint transgenic animal</p>
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Biology Essential Vocabulary Grades 9-11 continued

			ribosomal rna codon genetic code taxonomy binomial nomenclature kingdom phylum class order family genus species**(m) convergent evolution divergent evolution analogous structures homologous structures speciation(m) ectothermic endothermic behavior sexual selection reproductive behavior hormone endocrine gland target cell receptor muscular system(m) reproductive system(m) nervous system(m) circulatory system (m) cardiovascular heart valve alveolus	logistic model factor gene flow nonrandom mating genetic drift polygenic trait (m) directional selection stabilizing selection predator** parasite(m) predation(m) parasitism symbiosis mutualism(m) commensalism competition niche** competitive exclusion biodiversity** climate biome** plankton	
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Biology Essential Vocabulary Grades 9-11 continued

			<p>capillary diaphragm cell reproduction metabolism homeostasis gene** heredity evolution species natural selection(m) genome gene therapy cell membrane**(m) cytoplasm cytoskeleton ribosome prokaryote cell wall(m) flagellum eukaryote nucleus(m) organelle(m) cytoplasm(m) cilium endoplasmic reticulum vesicle golgi apparatus(m) mitochondrion lysosome chloroplast(m) vacuole(m) pigment chlorophyll</p>	
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Biology Essential Vocabulary Grades 9-11 continued

			<p>carbon dioxide fixation meiosis(m) crossing-over independent assortment sperm (m) ovum asexual reproduction** (m) clone sexual reproduction** genetic diversity(m) fertilization double helix nucleotide deoxyribose base-pairing rules complementary base pair dna polymerase speciation subspecies colonial organism aggregation multicellular differentiation tissue(m) organ(m) organ system(m) protist vascular tissue invertebrate vertebrate blastula ectoderm</p>	
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Biology Essential Vocabulary Grades 9-11 continued

			<p> endoderm mesoderm body plan asymmetrical radial symmetry bilateral symmetry phylogenic tree gastrovascular cavity respiration open circulatory system closed circulatory system hydrostatic skeleton exoskeleton hermaphrodite external fertilization internal fertilization placenta gestation period epithelial tissue nervous tissue connective tissue muscle tissue body cavity bone marrow joint ligament tendon neurons dendrites axon nerve/neuron(m) membrane potential resting potential </p>	
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Biology Essential Vocabulary Grades 9-11 continued

			action potential synapse neurotransmitter(m) central nervous system peripheral nervous system sensory neuron motor neuron brain cerebrum cerebellum brain stem thalamus hypothalamus spinal cord reflex		
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* Word, phrases appear in multiple grade-levels

** Word may appear on FCAT test

(M) Word included on Marzano's word list

Chemistry Essential Vocabulary
Grades 10-11

Strand A	Strand B	Strand C	Strand D	Strand E	Strand F	Strand G	Strand H
absolute zero	atmospheric pressure	condensation				biochemistry	actual yield
acid*	barometer	decomposition reaction					cubic centimeter
alkali metal	calorimetry	diffusion					dimensional analysis
alkaline earth metal	catalyst*	dipole					expected yield
anhydrous	combustion reaction	dipole interaction					gram
anion	energy	dispersion force					liter
aqueous*	electromagnetic radiation*	hydrogen bond					meter
atom	endothermic	metallic bond					metric system
atomic mass	entropy	double displacement reaction					percent yield
atomic number*	enthalpy	ionic bond					significant digit
atomic radius	excited state	polar covalent bond					si unit
atomic theory	exothermic	single displacement reaction					
avogadro's number	gas laws	single covalent bond					
base*	ground state	triple covalent bond					
boiling point	ideal gas	van der Waals force					
catalyst*	ionization energy						
cathode ray tube							
cation	joule						

Chemistry Essential Vocabulary
Grades 10-11 continued

chemical equation	kelvin*						
	temperature						
chemical formula	kinetic molecular						
	theory						
chemical property	law of						
	conservation of						
	energy*						
chemical reaction	melting						
chemistry	nuclear fission*						
coefficient	nuclear fusion*						
compound*	nuclear reaction						
covalent bond*	partial pressure						
density	photoelectric						
	effect						
deposition	specific heat						
direct combination	sublimation						
distillation	synthesis						
	reaction						
electron	thermochemistry						
electron affinity	equilibrium						
electron	visible spectrum						
configuration							
electronegativity	wavelength						
element							
empirical formula							
family							
freezing point							
gram formula mass							
group							
half-life*							
halogen							
heat capacity							

Chemistry Essential Vocabulary
Grades 10-11 continued

heterogenous							
homogenous							
hydrate							
immiscible							
indicator*							
inorganic compound							
ion							
ionic compound							
isotope*							
law of conservation of mass							
law of constant composition							
lewis structure							
mass number*							
matter							
metalloid							
miscible							
mixture							
molar mass							
molar volume							
mole							
molecular compound							
molecular formula							
molecule*							
monatomic ion							
neutralization							
neutron							
noble gas							
nonmetal							
nonpolar							
nucleus							

Chemistry Essential Vocabulary
Grades 10-11 continued

octet rule							
orbital							
organic chemistry							
oxidation number							
oxidize							
percent composition							
period							
periodic law							
periodic table							
periodic trend							
ph*							
phase							
photon							
physical property							
planks constant							
polar							
polar molecule							
polyatomic ion							
precipitate							
principal energy level							
product							
proton							
radioactive decay							
radioactivity							
radioisotope							
reactant*							
semimetal							
solubility*							
solute							
solution							
solvent							
stoichiometry							
stp							
structural formula							

Chemistry Essential Vocabulary
Grades 10-11 continued

sublevel transition metal valence electron vaporization volume							
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* Word, phrases appear in multiple grade-levels

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(M) Word included on Marzano's word list

Physics Essential Vocabulary
Grades 10-12

A. Nature of Matter	B. Energy	C. Force/Motion	D.	E. Earth/Space	F.	G.	H. Nature/Science
alpha particle* beta particle* conductor* conservation of mass* diffraction* displacement* electrical current electrical field* electrical potential* half-life* isotope* light* magnetic* magnetic field* prism* quantized* radioactive decay* resistance* temperature* ultraviolet* visible light x ray*	amplitude* circuit* conduction* conservation of energy* convection* crest* doppler effect* electromagnet* energy transfer* entropy* first law of thermodynamics* fission* frequency* fusion* gamma radiation* harmonics heat* heat of fusion* heat of vaporization* impulse infrared* interference* longitudinal waves* mechanical wave* ohm's law* parallel circuit* photon* pitch plasma* radiation* second law of thermodynamics*	acceleration* action-reaction pair* capacitor* centrifugal* centripetal force* chain reaction* compression* decibel efficiency* force* friction* fulcrum* gravitational force* inclined plane* inertia* lever* machine mechanical advantage mirrors momentum newton's first law* newton's second law* newton's third law* power* pressure* projectile motion pulley* rarefraction* reflection* refraction* resonance		ampere* astronomical unit light-year		system	accuracy* dependent variable* independent variable* investigation* precision* scalar* scientific method* spectroscope* variable*

Physics Essential Vocabulary
Grades 10-12 continued

	semiconductor* series circuit* thermal energy* transverse waves* trough*	screw* speed* torque vector* velocity* vibration* voltage wave* wave-particle duality* wavelength* wedge* weight* wheel and axle* work*					
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**Marine Science
Grades 10-12**

A. Nature of Matter	B. Energy	C. Force/Motion	D	E	F	G	H. Nature/Science
adhesion buffer cohesion hypertonic hypotonic ions (m) osotonic principle of constant proportions	belt fetch conveyor hydrostatic ocean period pressure upwelling	archimedes's principle buoyancy (m) crest density drag (m) eddies frequency	active coast asthenosphere atoll bathyl zone contour currents convergent boundary divergent boundary epipelagic zone groin gyre hotspots igeneous rock (m) longshore current mid oceanic ridge neap tides passive coast spring tides thermocline	gps	abiotic aerobic respiration anaerobic respiration bioluminescence biomagnification biomass biosphere biotic chitin chondrichytes chordates chromatophores claspers cyanobacteria decomposers (m) diatomaceous earth diurnal tide ecosystem (m) ecotherm emergent plant endotherm estuary intertidal zone osmoconformers osmoregulators pneumatophore sessile viviparous	mariculture maximum sustainable yield mutualsim	deductive reasoning inductive reasoning

* Word, phrases appear in multiple grade-levels

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(M) Word included on Marzano's word list

Environmental Essential Vocabulary
Grades 10-12

B Energy	D Processes that Shape the Earth	F Processes of Life	G How Living Things Interact with Their Environment	H The Nature of Science
nuclear energy nuclear fission nuclear fusion renewable energy passive solar heating active solar heating biomass fuel hydroelectric energy geothermal energy alternative energy ocean thermal energy conversion fuel cell energy efficiency energy conservation	geosphere crust mantle core lithosphere asthenosphere tectonic plate erosion atmosphere troposphere stratosphere ozone radiation conduction convection greenhouse effect water cycle evaporation condensation precipitation salinity freshwater biosphere ecosystem biome climate latitude altitude tropical rain	evolution natural selection adaptation artificial selection resistance	environmental science ecology natural resource agriculture biodiversity pollution biotic abiotic organism species population community habitat bacteria fungus protist gymnosperm angiosperm invertebrate vertebrate photosynthesis producer consumer decomposer cellular respiration food chain food web trophic level carbon cycle	law of supply and demand ecological footprint sustainability observation hypothesis prediction experiment variable experimental group control group data correlation distribution model sample value endangered species act habitat conservation plan biodiversity treaty potable pathogen irrigation dam reservoir desalination kyoto protocol land use planning geographic information system (gis)

Environmental Essential Vocabulary
 Grades 10-12 continued

forest canopy epiphyte temperate rain forest temperate deciduous forest taiga understory emergent layer savannah temperate grassland chapperal desert tundra permafrost wetland plankton nekton benthos littoral zone benthic zone estuary salt marsh mangrove swamp barrier island coral reef surface water river system watershed groundwater aquifer porosity permeability recharge zone climate el nino	nitrogen fixing bacteria nitrogen cycle phosphorus cycle ecological succession primary succession secondary succession pioneer species climax community eutrophication population density dispersion growth rate reproductive potential exponential growth carrying capacity niche competition predation parasitism mutualism commensalisms symbiosis demography age structure survivorship fertility rate migration life expectancy demographic transition arable land urbanization developed country undeveloped country biodiversity gene	global positioning systems(gps) u.s. wilderness act famine malnutrition yield genetic engineering genetic engineering reclamation pathogen host vector environemntal impact statement lobbying
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Environmental Essential Vocabulary
Grades 10-12 continued

	<p>la nina ozone layer erosion desertification topsoil ore mineral</p>		<p>keystone species ecotourism endangered species exotic species threatened species poaching endemic species water pollution point source pollution non-point source pollution waste water artificial (cultural) eutrophication thermal pollution biomagnification air pollution primary pollutant secondary pollutant smog temperature inversion acid precipitation ph acid shock ozone hole cfcs greenhouse gases global warming urban rural urbanization urban sprawl heat island overgrazing deforestation reforestation</p>	
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**Environmental Essential Vocabulary
Grades 10-12 continued**

			compost pesticide domesticated overharvesting aquaculture livestock surface mining subsurface mining smelting subsidence fossil fuels petroleum oil reserves solid waste biodegradable municiple solid waste land fill leachate recycling hazardous waste deep well injection toxicology epidemiology risk assessment sustainability economics	
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