

Science Intermediate 08-09
Monica Burgio Daigler, Erie 1 BOCES

		Number of Times PI Tested			
Standard/ Unit	Performance Indicator	2006	2007	2008	Totals
6 (skill)	Key Idea 2 Models	44	35	43	122
1 (skill)	S3.2 Interpret organized data	12	15	13	40
1 (skill)	S2.3 Carry out their research proposals	9	9	9	27
1 (skill)	S3.1 Design charts, tables and graphs	8	9	6	23
1(skill)	S2.1 Use conventional techniques	8	6	7	21
6 (skill)	Key Idea 5 Patterns of change	6	6	7	19
1 (skill)	M2 Deductive and Inductive Reasoning	8	5	4	17
1 (skill)	S2.2 Develop, present and defend normal research	4	5	5	14
1 (skill)	S1.2 Construct Explanations	4	4	5	13
1 (skill)	S1.3 Represent, present and defend the proposed explanations	4	5	4	13
1 (skill)	S1.1 Formulate Questions	3	2	7	12
1 (skill)	M1 Abstraction and Symbolic Representation	2	4	2	8
LE	5.1e Herbivores obtain energy from plants. Carnivores obtain energy from animals. Omnivores obtain energy from both plants and animals.	5	1	2	8
LE	2.2c The probability of traits being expressed can be determined using models of genetic inheritance.	3	2	2	7
LE	6.2a Photosynthesis is carried on by green plants and other organisms containing chlorophyll. In this process, the Sun's energy is converted into and stored as chemical energy in the form of a sugar.	3	1	2	6

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LE	5.1d The methods for obtaining nutrients vary among organisms. Producers, such as green plants, use light energy to make their food.	3	1	1	5
LE	7.1c In all environments, organisms interact with one another in many ways.	3		2	5
LE	7.2d Since the Industrial Revolution, human activities have resulted in major pollution of air, water, and soil.		2	3	5
PS	1.1e Most objects in the solar system have a regular and predictable motion.	1	2	2	5
PS	1.1h The apparent motions of the Sun, Moon, planets, and stars across the sky can be explained by Earth's rotation and revolution.	2	2	1	5
PS	1.1i The tilt of Earth's axis of rotation and the revolution of Earth around the Sun cause seasons on Earth.		3	2	5
PS	2.1e Rocks are composed of minerals.	1	3	1	5
PS	3.1b Solubility can be affected by the nature of the solute and solvent, temperature, and pressure.		1	4	5
LE	1.1a Living things are composed of cells.	3		1	4
LE	1.1c Most cells have cell membranes, genetic material, and cytoplasm. Some cells have a cell wall and/or chloroplasts.		2	2	4
LE	6.1a Energy flows through ecosystems in one direction, usually from the Sun, through producers to consumers and then to decomposers.	2	1	1	4
LE	6.2b The major source of atmospheric oxygen is photosynthesis.	1	2	1	4

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LE	6.2c Green plants are the producers of food which is used directly or indirectly by consumers.		2	2	4
PS	2.2g Rocks are classified according to their method of formation.	2	1	1	4
PS	3.1f A solid has definite shape and volume.	1	1	2	4
PS	3.1g Characteristic properties can be used to identify different materials, and separate a mixture of substances into its components.	1	3		4
PS	3.1i Buoyancy is determined by comparative densities.	1	2	1	4
PS	4.1b Fossil fuels contain stored solar energy and are considered nonrenewable resources.		2	2	4
PS	4.4g Without direct contact, a magnet attracts certain materials and either attracts or repels other magnets.	1	1	2	4
1	S1.4 Seek to clarify, assess critically and reconcile with their own thinking	1	1	1	3
6	Key Idea 6 Optimization		1	2	3
LE	1.1b The way in which cells function is similar in all living things.	2	1		3
LE	1.1h Living things are classified by shared characteristics on the cellular and organism level.	1	1	1	3
LE	1.2g Locomotion, necessary to escape danger, obtain food and shelter, and reproduce, is accomplished by the interaction	1	1	1	3
LE	2.1a Hereditary information is contained in genes.	1	1	1	3

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LE	3.1c Human activities such as selective breeding and advances in genetic engineering may affect the variations of species.	1	1	1	3
LE	3.2d Although the time needed for change in a species is usually great, some species of insects and bacteria have undergone significant change in just a few years.	1	2		3
LE	4.1b There are many methods of asexual reproduction, including division of a cell into two cells, or separation of part of an animal or plant from the parent, resulting in the growth of another individual.	1	2		3
LE	4.2a The male sex cell is the sperm. The female sex cell is the egg. The fertilization of an egg by a sperm results in a fertilized egg.	1	1	1	3
LE	4.2b In sexual reproduction, sperm and egg each carry one-half of the genetic information for the new individual.	1	1	1	3
LE	4.3d Patterns of development vary among animals. In some species the young resemble the adult, while in others they do not.	1	1	1	3
LE	7.1b Given adequate resources and no disease or predators, populations (including humans) increase.	1	1	1	3
PS	1.1d Gravity is the force that keeps planets in orbit around the Sun and the Moon in orbit around the Earth.	1	1	1	3
PS	1.1f The latitude/longitude coordinate system and our system of time are based on celestial observations.		2	1	3

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PS	1.1g Moons are seen by reflected light. Our Moon orbits Earth, while Earth orbits the Sun.	1	1	1	3
PS	2.1f Fossils are usually found in sedimentary rocks.	2		1	3
PS	2.2q Hazardous weather conditions include thunderstorms, tornadoes, hurricanes, ice storms, and blizzards.	2		1	3
PS	3.2a During a physical change a substance keeps its chemical composition and properties.	1	1	1	3
PS	3.2b Mixtures are physical combinations of materials and can be separated by physical means.	1	1	1	3
PS	3.2c During a chemical change, substances react in characteristic ways to form new substances with different physical and chemical properties.	1	2		3
PS	4.2c During a phase change, heat energy is absorbed or released.		2	1	3
PS	4.2d Most substances expand when heated and contract when cooled.	1	1	1	3
PS	4.2e Temperature affects the solubility of some substances in water.	1	2		3
PS	4.4a Different forms of electromagnetic energy have different wavelengths.	1		2	3
1	S3.3 Modify their personal understanding	1	1		2
7	Key Idea 1 Connections	1	1		2
LE	1.1e Cells are organized for more effective functioning in multicellular organisms.		1	1	2
LE	1.1f Many plants have roots, stems, leaves, and reproductive structures.	1		1	2
LE	1.2d During respiration, cells use oxygen to release the energy stored in food.		1	1	2

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LE	2.1d In asexual reproduction, all the genes come from a single parent.	1	1		2
LE	2.1e In sexual reproduction typically half of the genes come from each parent.		1	1	2
LE	2.2a In all organisms, genetic traits are passed on from generation to generation.	2			2
LE	2.2b Some genes are dominant and some are recessive.	2			2
LE	3.2b Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to permit its survival.	2			2
LE	4.1c Methods of sexual reproduction depend upon the species.		1	1	2
LE	4.3a Multicellular organisms exhibit complex changes in development, which begin after fertilization.	1		1	2
LE	4.4a In multicellular organisms, cell division is responsible for growth, maintenance, and repair.		1	1	2
LE	5.1c All organisms require energy to survive. The amount of energy needed and the method for obtaining this energy vary among cells. Some cells use oxygen to release the energy stored in food.	2			2
LE	5.2d Energy in foods is measured in Calories.		1	1	2
LE	6.1b Food webs identify feeding relationships among producers, consumers, and decomposers in an ecosystem.	1	1		2
LE	7.1a A population consists of all individuals of a species that are found together at a given place and time.	2			2

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LE	7.2b The environment may be altered through the activities of organisms. Alterations are sometimes abrupt.	1	1		2
PS	2.1a Nearly all the atmosphere is confined to a thin shell surrounding Earth.	1	1		2
PS	2.1g The dynamic processes that wear away Earth's surface include weathering and erosion.	1	1		2
PS	2.2a The interior of Earth is hot.			2	2
PS	2.2b Analysis of earthquake wave data (vibrational disturbances) leads to the conclusion that there are layers within Earth.	1		1	2
PS	2.2e The Theory of Plate Tectonics explains how the 'solid' lithosphere consists of a series of plates that 'float' on the partially molten section of the mantle.	1		1	2
PS	2.2f Plates may collide, move apart, or slide past one another.		1	1	2
PS	2.2m Most local weather condition changes are caused by movement of air masses.		1	1	2
PS	2.2r Substances enter the atmosphere naturally and from human activity.	1	1		2
PS	3.1a Substances have characteristic properties.	1		1	2
PS	4.2b Heat can be transferred through matter by the collisions of atoms and/or molecules (conduction) or through space (radiation).		1	1	2
PS	4.4b Light passes through some materials, sometimes refracting in the process.		1	1	2

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PS	5.1c An object's motion is the result of the combined effect of all forces acting on the object.		1	1	2
PS	5.1d Force is directly related to an object's mass and acceleration.	1		1	2
PS	5.1e For every action there is an equal and opposite reaction.	1		1	2
PS	5.2d Friction is a force that opposes motion.	1	1		2
PS	5.2g Simple machines include a lever, a pulley, a wheel and axle, and an inclined plane.		1	1	2
	4.3c Various body structures and functions change as an organism goes through its life cycle.		1	1	2
1	T1.1 - T1.5 Engineering Design	1			1
2	Key Idea 1 Systems thinking		1		1
2	Key Idea 3 Information technology can have positive and negative impacts on society	1			1
6	Key Idea 3 Magnitude and scale		1		1
LE	1.1d Some organisms are single cells; others, including humans, are multicellular.			1	1
LE	1.2a Each system is composed of organs and tissues which perform specific functions and interact with each other		1		1
LE	1.2e The excretory system functions in the disposal of dissolved waste molecules, the elimination of liquid and gaseous wastes, and the removal of excess heat energy.		1		1
LE	1.2f The circulatory system moves substances to and from cells, where they are needed or produced, responding to changing demands.		1		1

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LE	1.2h The nervous and endocrine systems interact to control and coordinate the body's responses to changes in the environment, and to regulate growth, development, and reproduction.			1	1
LE	1.2i The male and female reproductive systems are responsible for producing sex cells necessary for the production of offspring.			1	1
LE	3.1a The processes of sexual reproduction and mutation have given rise to a variety of traits within a species.			1	1
LE	3.2a In all environments, organisms with similar needs may compete with one another for resources.	1			1
LE	3.2c Many thousands of layers of sedimentary rock provide evidence for the long history of Earth and for the long history of changing lifeforms whose remains are found in the rocks.	1			1
LE	4.1a Some organisms reproduce asexually.			1	1
LE	4.3b In humans, the fertilized egg grows into tissue which develops into organs and organ systems before birth.	1			1
LE	4.3e Patterns of development vary among plants. In seed-bearing plants, seeds contain stored food for early development.			1	1
LE	4.3f As an individual organism ages, various body structures and functions change.		1		1

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LE	5.1a Animals and plants have a great variety of body plans and internal structures that contribute to their ability to maintain a balanced condition.		1		1
LE	5.1f Regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required for survival.		1		1
LE	5.2b Foods contain a variety of substances, which include carbohydrates, fats, vitamins, proteins, minerals, and water.			1	1
LE	6.1c Matter is transferred from one organism to another and between organisms and their physical environment.			1	1
LE	7.2a In ecosystems, balance is the result of interactions between community members and their environment.	1			1
PS	1.1c The Sun and the planets that revolve around it are the major bodies in the solar system.		1		1
PS	2.1d The majority of the lithosphere is covered by a relatively thin layer of water called the hydrosphere.			1	1
PS	2.1h The process of weathering breaks down rocks to form sediment.	1			1
PS	2.1i Erosion is the transport of sediment.	1			1
PS	2.2d Continents fitting together like puzzle parts and fossil correlations provided initial evidence that continents were once together.			1	1

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PS	2.2h The rock cycle model shows how types of rock or rock material may be transformed from one type of rock to another.			1	1
PS	2.2i Weather describes the conditions of the atmosphere at a given location for a short period of time.	1			1
PS	2.2n The movement of air masses is determined by prevailing winds and upper air currents.	1			1
PS	2.2o Fronts are boundaries between air masses.	1			1
PS	2.2p High-pressure systems generally bring fair weather.	1			1
PS	3.1c The motion of particles helps to explain the phases (states) of matter as well as changes from one phase to another.			1	1
PS	3.1e A liquid has definite volume, but takes the shape of a container.	1			1
PS	3.1h Density can be described as the amount of matter that is in a given amount of space.	1			1
PS	3.2d Substances are often placed in categories if they react in similar ways.			1	1
PS	3.2e The Law of Conservation of Mass states that during an ordinary chemical reaction matter cannot be created or destroyed.		1		1
PS	3.3a All matter is made up of atoms.			1	1
PS	3.3b Atoms and molecules are perpetually in motion.			1	1

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PS	3.3c Atoms may join together in well-defined molecules or may be arranged in regular geometric patterns.	1			1
PS	4.1d Different forms of energy include heat, light, electrical, mechanical, sound, nuclear, and chemical.	1			1
PS	4.1e Energy can be considered to be either kinetic energy, which is the energy of motion, or potential energy, which depends on relative position.			1	1
PS	4.4c Vibrations in materials set up wave-like disturbances that spread away from the source.	1			1
PS	4.4e Electrical circuits provide a means of transferring electrical energy.			1	1
PS	4.4f Without touching them, material that has been electrically charged attracts uncharged material, and may either attract or repel other charged material.		1		1
PS	4.5a Energy cannot be created or destroyed, but only changed from one form into another.		1		1
PS	5.2a Every object exerts gravitational force on every other object.			1	1
PS	5.2e A machine can be made more efficient by reducing friction.	1			1
PS	5.2f Machines can change the direction or amount of force, or the distance or speed of force required to do work.			1	1
(skill)7	Key Idea 2 Strategies				0
1 (skill)	Key Idea 1 Information Technology				0
1 (skill)	M3 Critical Thinking Skills				0
2 (skill)	Key Idea 2 Knowledge of the impacts and limitations of information systems				0

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6 (skill)	Key Idea 4 Equilibrium and stability				0
LE	1.1g Multicellular animals often have similar organs and specialized systems for carrying out major life activities.				0
LE	1.2b Tissues, organs, and organ systems help to provide all cells with nutrients, oxygen, and waste removal.				0
LE	1.2c The digestive system consists of organs that are responsible for the mechanical and chemical breakdown of food.				0
LE	1.2j Disease breaks down the structures or functions of an organism.				0
LE	2.1b Each gene carries a single unit of information.				0
LE	2.1c Each human cell contains a copy of all the genes needed to produce a human being.				0
LE	3.1b Changes in environmental conditions can affect the survival of individual organisms with a particular trait.				0
LE	4.1d Fertilization and/or development in organisms may be internal or external.				0
LE	4.4b In one type of cell division, chromosomes are duplicated and then separated into two identical and complete sets to be passed to each of the two resulting cells.				0
LE	4.4c Another type of cell division accounts for the production of egg and sperm cells in sexually reproducing organisms.				0
LE	4.4d Cancers are a result of abnormal cell division.				0

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LE	5.1b An organism's overall body plan and its environment determine the way that the organism carries out the life processes.				0
LE	5.1g The survival of an organism depends on its ability to sense and respond to its external environment.				0
LE	5.2a Food provides molecules that serve as fuel and building material for all organisms.				0
LE	5.2c Metabolism is the sum of all chemical reactions in an organism.				0
LE	5.2e In order to maintain a balanced state, all organisms have a minimum daily intake of each type of nutrient based on species, size, age, sex, activity, etc.				0
LE	5.2f Contraction of infectious disease, and personal behaviors such as use of toxic substances and some dietary habits, may interfere with one's dynamic equilibrium.				0
LE	7.1e The environment may contain dangerous levels of substances (pollutants) that are harmful to organisms.				0
LE	7.2c Overpopulation by any species impacts the environment due to the increased use of resources.				0
PS	1.1b Other stars are like the Sun but are so far away that they look like points of light.				0
PS	1.1a Earth's Sun is an average-sized star. The Sun is more than a million times greater in volume than Earth.				#REF!
PS	1.1j The shape of Earth, the other planets, and stars is nearly spherical.				0
PS	2.1b As altitude increases, air pressure decreases.				0

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PS	2.1c The rock at Earth's surface forms a nearly continuous shell around Earth called the lithosphere.				0
PS	2.2c Folded, tilted, faulted, and displaced rock layers suggest past crustal movement.				0
PS	2.2j Climate is the characteristic weather that prevails from season to season and year to year.				0
PS	2.2k The uneven heating of Earth's surface is the cause of weather.				0
PS	2.2l Air masses form when air remains nearly stationary over a large section of Earth's surface and takes on the conditions of temperature and humidity from that location.				0
PS	3.1d Gases have neither a determined shape nor a definite volume.				0
PS	3.3d Interactions among atoms and/or molecules result in chemical reactions.				0
PS	3.3e The atoms of any one element are different from the atoms of other elements.				0
PS	3.3f There are more than 100 elements.				0
PS	3.3g The periodic table is one useful model for classifying elements.				0
PS	4.1a The Sun is a major source of energy for Earth.				0
PS	4.1c Most activities in everyday life involve one form of energy being transformed into another.				0
PS	4.2a Heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature.				0

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PS	4.3a In chemical reactions, energy is transferred into or out of a system.				0
PS	4.4d Electrical energy can be produced from a variety of energy sources and can be transformed into almost any other form of energy.				0
PS	4.5b Energy can change from one form to another, although in the process some energy is always converted to heat. Some systems transform energy with less loss of heat than others.				0
PS	5.1a The motion of an object is always judged with respect to some other object or point.				0
PS	5.1b The motion of an object can be described by its position, direction of motion, and speed.				0
PS	5.2b Electric currents and magnets can exert a force on each other.				0
PS	5.2c Machines transfer mechanical energy from one object to another.				0