

Grade 8 Science Curriculum

[Chemistry](#) - Properties of matter, mixtures, pure substances, periodic Table, atomic structure, covalent bonding, ionic bonding and chemical reactions.

[Forces and Motion](#)- Inertia, $F_{\text{net}} = MA$, Newton's 3rd Law, Force, average speed, centripetal force, gravity, momentum, acceleration, friction, energy transformations, and equations.

[Immune System and Disease](#) - Cells, Immunity, Pasteur, Fleming, Salk, antibiotics, vaccines, bacteria, and viruses.

[Energy](#) - Energy transformations, roller coasters, Work = Force x Distance, power, weather, seasons, kinetic theory of matter, heat and temperature, conduction, radiation, convection, and evaporation.

[Genetics](#) – Mendelian genetics, punnett squares, human genetics, pedigrees, disease, cells, DNA, genes, alleles, mitosis, meiosis, mutations, natural selection and evolution.

[Flight Inquiry](#) - Forces and motion, energy, forces of flight, Bernoulli's principle, centripetal force, model building, and the scientific method.

[Reproduction](#) - The basic structure and function of the male and female reproductive systems as well as conception and birth are taught.

Grade 8	
Core Themes, Content Standards and EXPECTED PERFORMANCES (CMT Correlation)	
Content Standards	EXPECTED PERFORMANCES (CMT Correlation)
<p><i>Forces and Motion – What makes objects move the way they do?</i></p> <p>8.1 An object’s inertia causes it to continue moving the way it is moving unless it is acted upon by a force to change its motion.</p> <ul style="list-style-type: none"> • The motion of an object can be described by its position, direction of motion and its speed. • An unbalanced force, acting on an object changes its speed or direction of motion, or both. • Objects moving in circles must experience force acting toward the center. 	<p>C 22. Calculate average speed of a moving object and illustrate the motion of objects in graphs of distance over time.</p> <p>C 23. Describe the qualitative relationships among force, mass and changes in motion.</p> <p>C 24. Describe the forces acting on an object moving in a circular path.</p>
<p>8.2 Reproduction is a characteristic of living systems and it is essential for the continuation of every species.</p> <ul style="list-style-type: none"> • Heredity is the passage of instructions specifying traits from one generation to another • Some of the characteristics of an organism are inherited and some result from interacts with the environment. 	<p>C15) Describe the basic structures of an animal cell, including the nucleus, cytoplasm, mitochondria and cell membrane, and how the function to support life.</p> <p>C 25. Explain the similarities and differences in cell division in somatic and germ cells</p> <p>C 26. Describe the function of the male and female human reproduction system, including the process of egg and sperm production</p> <p>C 27. Describe the structure of the genes on chromosomes, and explain sex determination in humans.</p>
<p>8.3.a Gravity is the force that governs the motions of objects in the solar system.</p> <p>8.3.b The motion of the Earth and moon relative to the sun causes daily, monthly and yearly cycles on the Earth.</p>	<p>C 28. Explain the effect of gravity on the orbital movement of planets in the solar system.</p> <p>C 29. Explain how the regular motion of the sun, earth and moon explains the seasons, phases of the moon and eclipses.</p>
<p>Science and Technology in Society – How do science and technology affect the quality of our lives?</p> <p>8.4 In the design of structures there is a need to consider factors such as function, materials, safety, cost and appearance.</p> <ul style="list-style-type: none"> • Bridges can be designed in different ways to withstand certain loads and potentially destructive forces. 	<p>C 30. Explain how beam, truss and suspension bridges are designed to withstand the forces that act on them.</p>

Grade 8 Science Curriculum: Chemistry

Properties of Matter - How does the structure of matter affect the properties and uses of materials?

STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
6.1 Materials can be classified as pure substances or mixtures, depending on their chemical and physical properties. <ul style="list-style-type: none"> ◆ Mixtures are made of combinations of elements and/or compounds, and they can be separated using a variety of physical means. ◆ Pure substances can be either elements or compounds, and they cannot be broken down by physical means. 		C1. Describe the properties of common elements such as oxygen, hydrogen, carbon, iron and aluminum. C2. Describe how the properties of simple compounds, such as water and Table salt, are different from the properties of the elements of which they are made. C3. Explain how mixtures can be separated by using the properties of the substances from which they are made, such as particle size, density, solubility and boiling point.		
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
Using your knowledge of atomic structure, covalent bonding, ionic bonding, and the octet rule, explain how elements might interact with one another. CT Frameworks <ul style="list-style-type: none"> • The nature of science • History of science • Living things and their Environments • Units of structure and Function • Water • The Earth's atmosphere • Structure of Matter • Energy • Interaction of Matter and Energy • Science and technology 	Classification: Classify different types of matter (elements, compounds, solutions, colloids, heterogeneous) Describe the properties of common elements such as oxygen, hydrogen, carbon, iron and aluminum. Describe how the properties of simple compounds, such as water and Table salt, are different from the properties of the elements of which they are made. Explain how mixtures can be separated by using the properties of the substances from which they are made, such as particle size, density, solubility and boiling point.	Classification: <ol style="list-style-type: none"> 1. Classification labs 2. Decomposition of Hydrogen Peroxide Lab 3. Various Demos: Lab Demo: The <u>addition</u> of oxygen and hydrogen. $\text{O}_2 + 2\text{H}_2 \rightarrow 2\text{H}_2\text{O}$ Lab Activity: The <u>decomposition</u> of H_2O_2 Lab Demo/Activity: The <u>addition</u> of oxygen and Iron. $\text{Fe} + 3 \text{O}_2 \rightarrow 2 \text{Fe}_2\text{O}_3$	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	http://www.chemsoc.org/viselements/ Pg 517 <u>Chemistry - A modern course</u> . Smoot, Price, and Smith Pg 112 <u>Elements of chemistry</u> . <u>Review text in physical science</u> pg 109 and 139. http://www.mansfieldct.org/schools/mms/staff/hand/index.html

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Chemistry Review →	<p>6(d) Explore and describe the exchange of carbon dioxide and oxygen during the process of photosynthesis in green plants.</p> <p>7.6 The Earth is layered with a lithosphere, hot mantle and dense metallic core.</p>

Grade 8 Science Curriculum: Forces and Motion

<i>Forces and Motion – What makes objects move the way they do?</i>				
STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
<p><i>Forces and Motion – What makes objects move the way they do?</i></p> <p>8.1 An object's inertia causes it to continue moving the way it is moving unless it is acted upon by a force to change its motion.</p> <ul style="list-style-type: none"> The motion of an object can be described by its position, direction of motion and its speed. An unbalanced force, acting on an object changes its speed or direction of motion, or both. Objects moving in circles must experience force acting toward the center. 		<p>C 22. Calculate average speed of a moving object and illustrate the motion of objects in graphs of distance over time.</p> <p>C 23. Describe the qualitative relationships among force, mass and changes in motion.</p> <p>C 24. Describe the forces acting on an object moving in a circular path.</p>		
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<p>Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another.</p> <p>What causes a change in motion?</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> The Nature of Science History of Science Energy Interaction of Matter and Energy Science and Technology <p>Extension Activities: Physics of Riverside, Calculate Acceleration of a ball.</p>	<p>Speed Calculate average speed of a moving object and illustrate the motion of objects in graphs of distance over time.</p> <p>Calculate average speed:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> $\text{Average Speed} = \frac{d_2 - d_1}{t_2 - t_1}$ </div> <p>Position-Time Graphs Illustrate the motion of objects in graphs of distance over time.</p>	<p>Gravity Labs</p> <p>Activities:</p> <ol style="list-style-type: none"> Rolling a marble down a ramp. Running down the hallway. Calculating the speed of traffic on Spring Hill Road. Pasco Motion Labs Pasco Position-Time Graphs 	<ul style="list-style-type: none"> Rubrics for each student/teacher generated project Teacher observations Unit Quizzes/Tests Homework Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p> <p>http://www.virtualprof.com/ physics tutorials</p>

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Grade 8 Science Curriculum: Forces and Motion

<i>Forces and Motion – What makes objects move the way they do?</i>				
STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
8.1 An object's inertia causes it to continue moving the way it is moving unless it is acted upon by a force to change its motion. <ul style="list-style-type: none"> The motion of an object can be described by its position, direction of motion and its speed. An unbalanced force, acting on an object changes its speed or direction of motion, or both. Objects moving in circles must experience force acting toward the center. 		C 22. Calculate average speed of a moving object and illustrate the motion of objects in graphs of distance over time. C 23. Describe the qualitative relationships among force, mass and changes in motion. C 24. Describe the forces acting on an object moving in a circular path.		
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another. What causes a change in motion? CT Frameworks <ul style="list-style-type: none"> The Nature of Science History of Science Energy Interaction of Matter and Energy Science and Technology Extension Activities: Physics of Riverside, Create a hovercraft	Newton's First Law/Inertia Explain the concept of friction: Friction acts against inertia. It is the force that opposes the motion between 2 surfaces that are touching each other. Without friction, an object in motion would move at a constant speed forever. Explain that the amount of mass an object has is a measure of its inertia; a large mass has a lot of inertia and therefore, it is difficult to change the velocity of a large mass. In contrast, a small mass has very little inertia and is therefore very easy to accelerate.	Note taking Reading Videos Bingo Review games	<ul style="list-style-type: none"> Rubrics for each student/teacher generated project Teacher observations Unit Quizzes/Tests Homework Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html http://www.nasa.gov/ http://www.learner.org/exhibits/parkphysics/

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Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another. What causes a change in motion? CT Frameworks <ul style="list-style-type: none"> • The Nature of Science • History of Science • Energy • Interaction of Matter and Energy • Science and Technology Extension Activities: Physics of Riverside, Angular momentum	Gyroscopic Inertia Observe and explain gyroscopic inertia. Graph and analyze data. Explain the results of a study.	Gyroscopic Inertia Lab Activities Spinning a bike tire and suspending it by one rope. Gyroscopes Frisbee	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	http://www.mansfieldct.org/schools/mm/s/staff/hand/index.html http://www.virtualprof.com/physics_tutorials

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Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another. What causes a change in motion? CT Frameworks <ul style="list-style-type: none"> The Nature of Science History of Science Energy Interaction of Matter and Energy Science and Technology Extension Activities: Physics of Riverside, Research Aristotle, Galileo and Newton	Newton's Second Law Describe the qualitative relationships among force, mass and changes in motion. Explain that unbalanced force, acting on an object, changes its speed or direction of motion, or both. Calculate net force Calculate acceleration. Explain why a rocket accelerates over time as it flies.	Newton's Second Law Lab Activities: <ol style="list-style-type: none"> Second Law of motion apparatus. Pulling different masses with Newton-meters/elastics Pushing a car. 	<ul style="list-style-type: none"> Rubrics for each student/teacher generated project Teacher observations Unit Quizzes/Tests Homework Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html

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Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another. What causes a change in motion? CT Frameworks <ul style="list-style-type: none"> • The Nature of Science • History of Science • Energy • Interaction of Matter and Energy • Science and Technology Extension Activities: Physics of Riverside, Research Newton	Newton's Third Law Explain that forces always come in pairs: when one object exerts a force on a second object, the second exerts an equal and opposite force on the first. Graph and analyze data. Explain the results of a study.	Newton's Third Law Lab Activities: <ol style="list-style-type: none"> 1. Measuring with force meters 2. Pasco Lab 3. Firing water rockets 4. Balloon rockets 5. Slingshot cars 6. Hero's engine 	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html

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Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another. What causes a change in motion? CT Frameworks <ul style="list-style-type: none"> • The Nature of Science • History of Science • Energy • Interaction of Matter and Energy • Science and Technology Extension Activities: Physics of Riverside Graph the inverse relationship between radius and velocity. Calculate the centripetal acceleration.	Centripetal Force Explain that centripetal force is a force that acts on an object toward the center of its circular path. Explain that objects moving in circles must experience force acting toward the center. Graph and analyze data. Explain the results of a study. Determine if a roller coaster can stay on its loop.	Centripetal Force Lab Activities: <ol style="list-style-type: none"> 1. Spinning a marble on a coat hanger 2. Centripetal Force Lab 3. Flying a pylon plane on a corkscrew 4. Calculating: centripetal acceleration = v^2/r 5. Downy fabric softener 	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html

Grade 8 Science Curriculum: Forces and Motion

<i>Forces and Motion – What makes objects move the way they do?</i>				
STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
8.3.a Gravity is the force that governs the motions of objects in the solar system.		C 28. Explain the effect of gravity on the orbital movement of planets in the solar system. C 29. Explain how the regular motion of the sun, earth and moon explains the seasons, phases of the moon and eclipses.		
8.3.b The motion of the Earth and moon relative to the sun causes daily, monthly and yearly cycles on the Earth.				
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
<p>Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another.</p> <p>How could 2 colliding objects interact in terms of Newton's laws?</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> • The Nature of Science • History of Science • Energy • Interaction of Matter and Energy • Science and Technology <p>Extension Activities: Physics of Riverside, Research the formula for the period of a pendulum.</p>	<p>Gravity</p> <p>Explain that gravity is the force that governs the motions of objects in the solar system.</p> <p>Explain that gravitational pull is affected by the mass of objects and distance between them. (Newton)</p> <p>Explain that objects in a vacuum always fall at the same rate. Gravity affects all objects equally.</p> <p>Explain why Aristotle's belief about falling objects was wrong.</p> <p>Determine how frequency of a pendulum is affected by mass.</p> <p>Use these equations: $V = gt$ $D = 1/2gt^2$ $D = vt$</p>	<p>Gravity Lab Activities:</p> <ol style="list-style-type: none"> 1. Dropping a horizontal hammer 2. Dropping paper using a book to block air resistance. 3. Dropping objects of different mass. 4. Trap door launch. 5. Dropping a coke can with a hole in the bottom. 6. Calculating the acceleration due to gravity. 7. How does mass affect the period of a pendulum? 8. How high can you throw a ball? 	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p>

Grade 8 Science Curriculum: Forces and Motion

Earth in the Solar System: How does the position of the earth in the solar system affect the conditions on our planet?				
STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
<p>8.3.a Gravity is the force that governs the motions of objects in the solar system.</p> <p>8.3.b The motion of the Earth and moon relative to the sun causes daily, monthly and yearly cycles on the Earth.</p>		<p>C 28. Explain the effect of gravity on the orbital movement of planets in the solar system.</p> <p>C 29. Explain how the regular motion of the sun, earth and moon explains the seasons, phases of the moon and eclipses.</p>		
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
<p>Forces and Motion:</p> <p>Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another.</p> <p>How could 2 colliding objects interact in terms of Newton's laws?</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> • The Nature of Science • History of Science • Energy • Interaction of Matter and Energy • Science and Technology <p>Extension Activities: Physics of Riverside, Research Projectile Motion</p>	<p>Gravity and our solar system</p> <p>Explain that gravity is the force that governs the motions of objects in the solar system.</p> <p>Explain how the regular motion of the sun, earth and moon explains the seasons, phases of the moon and eclipses.</p> <p>Explain that the motion of the earth and moon relative to the sun causes daily, monthly and yearly cycles on earth.</p>	<p>Gravity and solar system Lab Activities:</p> <ol style="list-style-type: none"> 1. Graph how distance of planets from the sun affects the time it takes to revolve around the sun. 2. Moon journal 3. Relative position and axis of rotation drawings. 	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p> <p>http://www.virtualprof.com/physics_tutorials</p> <p>http://www.nasa.gov/</p> <p>http://www.learner.org/exhibits/parkphysics/</p>

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Forces and Motion: Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another. How could 2 colliding objects interact in terms of Newton's laws? CT Frameworks <ul style="list-style-type: none"> The Nature of Science History of Science Energy Interaction of Matter and Energy Science and Technology Extension Activities: Physics of Riverside, Predict where a rolling ball will land after falling off the Table.	Vertical and Horizontal independence Show that horizontal motion has no effect on gravitational pull- a bullet shot from a gun will hit the same time as a bullet dropped to the ground. Graph and analyze data. Explain the results of a study. Momentum Calculate and explain: $Momentum = Mass * Speed$	Vertical and Horizontal independence Lab Activities: <ol style="list-style-type: none"> Dropping and shooting pennies with a ruler. Shoot a bullet drop a bullet demonstration. Ballistic car: Discover what happens when a ball is tossed up or dropped as it is traveling in a horizontal direction. Monkey and the Hunter demonstration Momentum Lab Activities: <ol style="list-style-type: none"> Measuring how far balls of different mass roll. Placing ping-pong ball on a tennis ball and observing the transfer of momentum. Note taking Reading Videos Bingo Review games	<ul style="list-style-type: none"> Rubrics for each student/teacher generated project Teacher observations Unit Quizzes/Tests Homework Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html

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Forces and Motion: Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another. How could 2 colliding objects interact in terms of Newton's laws? CT Frameworks <ul style="list-style-type: none"> The Nature of Science History of Science Energy Interaction of Matter and Energy Science and Technology Extension Activities: Physics of Riverside, Calculate the conservation of momentum.	Conservation of Momentum Explain The Law of Conservation of Momentum: a) Total Momentum before interaction = The Total Momentum after. $(M * V)$ of object a + $(M * V)$ of object b = $(M * V)$ of object a + $(M * V)$ of object b b) Momentum can be transferred from one object to another. c) The momentum lost by one-object equals the momentum gained by the other object. Explain that Kinetic energy is conserved after a collision.	Conservation of Momentum Lab Activities: 1. How is the height of a rocket affected by the mass of exhaust? 2. Place a ping-pong ball on a tennis ball and observe the transfer of momentum. 3. Calculating conservation of momentum with marbles. 4. Newtonian demonstrator device. If one ball is dropped, then one ball is knocked out on the other side. Note taking Reading Videos Bingo Review games	<ul style="list-style-type: none"> Rubrics for each student/teacher generated project Teacher observations Unit Quizzes/Tests Homework Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html http://www.virtualprof.com/physics/tutorials http://www.nasa.gov/ http://www.learner.org/exhibits/parkphysics/

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Use your knowledge of Newton's Laws and the conservation of momentum to explain how 2 objects might interact with one another. How could 2 colliding objects interact in terms of Newton's laws? CT Frameworks <ul style="list-style-type: none"> The Nature of Science History of Science Energy Interaction of Matter and Energy Science and Technology Extension Activities: Physics of Riverside, Design a loop coaster using math.	Physics Explain the physics of a roller coaster. Calculate the velocity of a marble (coaster car). $Velocity = \sqrt{2 * 9.8 * H}$ <i>H= distance from the top of roller coaster (in meters).</i> Toys in space: Predict how toys will behave in space. Speed: calculate the speed of various wind-up toys Predict when 2 balls dropped from different positions on a ramp will meet.	Roller coasters Lab Activities: 1. Build a roller coaster out of foam pipes and tape. Note taking Reading Videos Bingo Review games	<ul style="list-style-type: none"> Rubrics for each student/teacher generated project Teacher observations Unit Quizzes/Tests Homework Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html

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<p>Laws of Motion Review →</p>	<p>6.1 Energy is the ability to do work and be either potential (energy of position) of kinetic (energy of motion).</p> <p>6.2 Potential energy and kinetic energy can be transformed from one to the other, and both can be used to do work.</p> <p>6(a) Perform experiments to explore the relationship between force, distance and work.</p> <p>6(b) Explore how simple machines (e.g. inclined plane, pulleys and levers) are used to create mechanical advantage.)</p> <p>6(c) Explore and describe how the transformations of potential and kinetic energy are used to do work.</p> <p>8.5 The solar system is composed of planets and other objects that orbit the sun in regular and predictable motion.</p> <p>8.6 Gravity is the force that governs the motions of the solar system, attracts object to the Earth and influences tides.</p> <p>8(g) Explore and explain the effect of gravity on the orbital movement of planets in the solar system.</p> <p>8(h) Explore and explain how the regular motion of the Sun, Earth and Moon explains the day, year, phases of the moon and eclipses.</p> <p>8(i) Compare and contrast the characteristics (i.e., orbital patterns, atmosphere, composition, temperature) of the planets in the solar system, and their potential to sustain life.</p> <p>8(j) Explore how the space program provides new information about the solar system.</p> <p>8(k) Explore how life can be sustained in space.</p>

Grade 8 Science Curriculum: Immune System and Disease

STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
7.2 a All organisms are composed of one or more cells; each cell carries on life-sustaining functions.		C15) Describe the basic structures of an animal cell, including the nucleus, cytoplasm, mitochondria and cell membrane, and how the function to support life.		
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
<p>How do the different cells of the immune system work together to fight off an invader and prevent future attacks on the body?</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> • The Nature of Science • History of Science • Units of Structure and Function • Relationships of Structure and Function • Cycles of life • Science and Technology <p>Extension Activities: Research emerging diseases. Research antibiotic-resistant bacteria. Research the Influenza pandemic of 1918.</p>	<p>Identify and explain the organelles within plant and animal cells.</p> <p>Explain how the transmission of bacterial and viral disease enables us to prevent, treat and cure many diseases.</p> <p>Describe the cause and spreading mechanism of viral and bacterial diseases.</p> <p>Explore and explain the role of the immune system and how vaccination and antibiotics are used to enhance the fight against infectious diseases.</p> <p>Identify the roles of the following: B cell, plasma cell, Killer T, Helper T, Suppressor T, Memory T, antibodies, antigens, etc...</p> <p>Explain the events that proved spontaneous generation to be incorrect.</p>	<p>Putting the immune system response in order</p> <p>Categorizing the cells of the immune system</p> <p>Note taking Reading Videos Bingo Review games</p>	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p> <p>http://www2.cdc.gov/mmwr/distrnds.html disease trends</p> <p>http://www.healthcentral.com/home/home.html</p>

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7.2 a All organisms are composed of one or more cells; each cell carries on life-sustaining functions.		C15) Describe the basic structures of an animal cell, including the nucleus, cytoplasm, mitochondria and cell membrane, and how the function to support life.		
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
<p>How do the different cells of the immune system work together to fight off an invader and prevent future attacks on the body?</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> • The Nature of Science • History of Science • Units of Structure and Function • Relationships of Structure and Function • Cycles of life • Science and Technology <p>Extension Activities: Research emerging diseases. Research antibiotic-resistant bacteria. Research the Influenza pandemic of 1918.</p>	<p>Explain how the transmission of bacterial and viral disease enables us to prevent, treat and cure many diseases.</p> <p>Describe the cause and spreading mechanism of viral and bacterial diseases.</p> <p>Explain the difference between bacteria and viruses.</p> <p>Understand why man cannot treat or kill the cold virus in the body.</p> <p>Explain how new cold viruses emerge.</p> <p>Be familiar with past epidemics (Bubonic plague, polio, influenza etc...) and new, emerging diseases. (Ebola, Hanta Virus, etc..)</p>	<p>Putting the immune system response in order</p> <p>Categorizing the cell of the immune system</p> <p>Note taking Reading Videos Bingo Review games</p>	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p> <p>http://www2.cdc.gov/mmwr/distrnds.html disease trends</p> <p>http://www.healthcentral.com/home/home.html</p>

Grade 8 Science Curriculum: Immune system and Disease

STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
7.2 a All organisms are composed of one or more cells; each cell carries on life-sustaining functions.		C15) Describe the basic structures of an animal cell, including the nucleus, cytoplasm, mitochondria and cell membrane, and how the function to support life.		
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
<p>How do the different cells of the immune system work together to fight off an invader and prevent future attacks on the body?</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> • The Nature of Science • History of Science • Units of Structure and Function • Relationships of Structure and Function • Cycles of life • Science and Technology <p>Extension Activities: Research emerging diseases. Research antibiotic-resistant bacteria. Research the Influenza pandemic of 1918.</p>	<p>Understand the difference between, Pandemics, epidemics and endemics.</p> <p>Explain the process of immunization and the difference between active and passive immunity.</p> <p>Explain how a vaccine works.</p> <p>Explain how an antibiotic works.</p> <p>Explain how microbes might become resistant to antibiotics</p> <p>Explain how diseases are spread by direct contact, indirect contact and by droplet infection.</p>	<p>Putting the immune system response in order</p> <p>Categorizing the cell of the immune system</p> <p>Note taking Reading Videos Bingo Review games</p>	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p> <p>http://www2.cdc.gov/mmwr/distrnds.html disease trends</p> <p>http://www.healthcentral.com/home/home.html</p>

Grade 8 Science Curriculum: Immune system and disease

STATE FRAMEWORK CONTENT STANDARDS:	EXPECTED PERFORMANCES (CMT CORRELATION):
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Review for the immune system →	<p>7.4 All organisms are made up of one or more cells that have common structures to maintain life.</p> <p>7.5 Many organisms, including humans, have specialized organ systems that interact with each other to maintain dynamic internal balance.</p> <p>7(d) Explore and describe the structures and function of a basic animal cell (e.g., nucleus, cytoplasm, mitochondria, and cell membrane.)</p> <p>7(e) Explore and explain how materials move in and out of the cell through passive and active transport processes.</p> <p>7(f) Explore the structures of the human digestive, respiratory, and circulatory systems, and describe how they function to support life.</p>
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Grade 8 Science Curriculum: Energy

Energy in the Earth's Systems – How do external and internal sources of energy affect the Earth's systems?

STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
6.3 Local and regional weather are affected by the amount of solar energy the area receives and proximity to a large body of water.		C7. Describe the effect of heating on the movement of molecules in solids, liquids and gases. C8. Explain how local weather conditions are related to the temperature, pressure and water content of the atmosphere and the proximity to a large body of water. C9. Explain how the uneven heating of the Earth's surface causes winds and affects the seasons.		
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
<p>How does heat affect the kinetic behavior of solids, liquids and gases?</p> <p>Does our planet do work on the moon?</p> <p>Explain the Law of Conservation of energy.</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> The Nature of Science History of Science Water The Earth's Atmosphere The Structure of Matter Energy Interaction of Matter and Energy Science and Technology <p>ENRICHMENT: Students will create windmills that will be the most powerful.</p> <p>Research Peak Oil or green energy</p>	<p>MOLECULAR BEHAVIOR</p> <p>Describe the effect of heating on the movement of molecules in solids, liquids and gases.</p> <p>Explain how the motion of molecules is affected when heat is added to, or taken away from, a system.</p> <p>Explain how heat affects the expansion and contraction of Gases.</p> <p>Explain how the uneven heating of the Earth's surface causes winds and affects the seasons.</p> <p>Explain how heat affects the expansion and contraction of Solids.</p> <p>Explain how heat affects the expansion and contraction of Liquids.</p>	<p>How Heat affects molecular behavior</p> <p>Lab Activities:</p> <ul style="list-style-type: none"> Expanding air in a 2-liter bottle in hot water. Contracting it in cold. Heat an open bottle. Once heated, cap it and remove from the heat. Observe! Students explain concepts. Bimetallic strip Observing the behavior and densities of liquids at different temperatures. Demo: Equal masses of hot water, and cold. Why the different volumes? 	<ul style="list-style-type: none"> Rubrics for each student/teacher generated project Teacher observations Unit Quizzes/Tests Homework Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p>

Grade 8 Science Curriculum: Energy

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<p>How does heat affect the kinetic behavior of solids, liquids and gases?</p> <p>Does our planet do work on the moon?</p> <p>Explain the Law of Conservation of energy.</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> • The Nature of Science • History of Science • Water • The Earth's Atmosphere • The Structure of Matter • Energy • Interaction of Matter and Energy • Science and Technology <p>ENRICHMENT: Students will create windmills that will be the most powerful.</p> <p>Research Peak Oil or green energy</p>	<p>HOW HEAT MOVES</p> <p>Convection Explain how heat moves by Convection.</p> <p>Describe the effect of heating on the movement of molecules in solids, liquids and gases.</p> <p>Explain how the uneven heating of the Earth's surface causes winds and affects the seasons.</p> <p>Show how heat from the sun affects the direction of wind at different times during a 24-hour cycle.</p> <p>Conduction Explain how heat moves by Conduction.</p> <p>Explain Condensation. Why does it happen? At what temperature does it occur?</p>	<p>How heat moves- Convection Lab Activities:</p> <ol style="list-style-type: none"> Convection Box Saw dust and water Liquid convection apparatus <p>How heat moves- Conduction Lab Activities:</p> <ol style="list-style-type: none"> Balloon lab. How does size of rod affect conduction rate? Conduction rates of different metals. (Brass, Copper, Iron) Different surfaces at the same temperature. Yet one feels cold. Why? Metal conducts heat away from paper. Conductometer lab 	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p>

Grade 8 Science Curriculum: Energy

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<p>How does heat affect the kinetic behavior of solids, liquids and gases?</p> <p>Does our planet do work on the moon?</p> <p>Explain the Law of Conservation of energy.</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> • The Nature of Science • History of Science • Water • The Earth's Atmosphere • The Structure of Matter • Energy • Interaction of Matter and Energy • Science and Technology <p>ENRICHMENT: Students will create windmills that will be the most powerful.</p> <p>Research Peak Oil or green energy</p>	<p>How heat moves- Radiation</p> <p>Explain how heat moves by Radiation</p> <p>Explain how humidifiers make one feel warmer in the winter.</p> <p>Pressure and temperature</p> <p>Explain how pressure and temperature is directly proportional.</p>	<p>How heat moves- Radiation Lab Activities:</p> <p>a) Holding hand under a light bulb. Is this conduction? convection?</p> <p>b) How aluminum foil can radiate heat.</p> <p>c) How different surfaces absorb radiation.</p> <p>d) What color is a good radiator? White? Black? Aluminum?</p> <p>e) How does a radiometer work?</p> <p>How pressure affects molecular behavior Lab Activities</p> <ul style="list-style-type: none"> • Fire syringe • Why aerosols feel cold 	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p>

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<p>How does heat affect the kinetic behavior of solids, liquids and gases?</p> <p>Does our planet do work on the moon?</p> <p>Explain the Law of Conservation of energy.</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> • The Nature of Science • History of Science • Water • The Earth's Atmosphere • The Structure of Matter • Energy • Interaction of Matter and Energy • Science and Technology <p>ENRICHMENT: Students will create windmills that will be the most powerful.</p> <p>Research Peak Oil or green energy</p>	<p>Evaporation Explain how Evaporation can take heat away.</p>	<p>Evaporation Lab Activities:</p> <ol style="list-style-type: none"> 1. Putting alcohol on the bulb of a thermometer. 2. Why do we sweat? 3. Why do people humidify a home in winter? 4. Clay pot refrigerators! 5. Why aerosol sprays feel cold. <p>Note taking Reading Videos Bingo Review games</p>	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p> <p>Physics for every kid, Janice VanCleave</p>

Grade 8 Science Curriculum: Energy

STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
7.1.a Work is the process of making objects move through the application of force. 7.1.b Energy can be stored in many forms and can be transformed into the energy of motion.		C12. Explain the relationship among, force, distance and work, and use the relationship ($W = F \times D$) to calculate work done in lifting heavy objects. C13. Explain how simple machines, such as inclined planes, pulleys and levers, are used to create mechanical advantage. C14. Describe how different types of stored (potential) energy can be used to make objects move.		
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
How does heat affect the kinetic behavior of solids, liquids and gases? Does our planet do work on the moon? Explain the Law of Conservation of energy. CT Frameworks <ul style="list-style-type: none"> • The Nature of Science • History of Science • Water • The Earth's Atmosphere • The Structure of Matter • Energy • Interaction of Matter and Energy • Science and Technology ENRICHMENT: Students will create windmills that will be the most powerful. Research Peak Oil or green energy	Energy: Explain the difference between heat and temperature. Heat Energy Explain Law 1: Energy can neither be created nor be destroyed. Explain Law 2: Heat <u>will not</u> flow spontaneously from a colder body to a hotter body. It flows from hot to cold.	Note taking Reading Videos Bingo Review games	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html

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<p>7.1.a Work is the process of making objects move through the application of force.</p> <p>7.1.b Energy can be stored in many forms and can be transformed into the energy of motion.</p>	<p>C12. Explain the relationship among, force, distance and work, and use the relationship ($W = F \times D$) to calculate work done in lifting heavy objects.</p> <p>C13. Explain how simple machines, such as inclined planes, pulleys and levers, are used to create mechanical advantage.</p> <p>C14. Describe how different types of stored (potential) energy can be used to make objects move.</p>
<p>Energy Review →</p> <p>6.1 Energy is the ability to do work and be either potential (energy of position) of kinetic (energy of motion).</p> <p>6.2 Potential energy and kinetic energy can be transformed from one to the other, and both can be used to do work.</p> <p>6.3 Energy from sunlight is captured and transformed into chemical energy by green plants to support life in most ecosystems.</p> <p>6.4 Variation in the amount of the sun's energy hitting the Earth's surface affects daily and seasonal weather patterns.</p> <p>6.5 Factors such as latitude, topography, and proximity to an ocean affect regional temperatures.</p> <p>6(a) Perform experiments to explore the relationship between force, distance and work.</p> <p>6(b) Explore how simple machines (e.g. inclined plane, pulleys and levers) are used to create mechanical advantage.)</p> <p>6(c) Explore and describe how the transformations of potential and kinetic energy are used to do work.</p> <p>6(d) Explore and describe the exchange of carbon dioxide and oxygen during the process of photosynthesis in green plants.</p> <p>6(e) Describe matter and energy flow in food webs.</p> <p>6(f) Explore a natural or simulated ecosystem and describe the density and distribution of typical organisms in that ecosystem.</p> <p>6(g) Describe how the sun's energy affects air pressure in the atmosphere and influences the weather.</p> <p>6(h) Explore and describe the gas composition of the atmosphere and its protective effects on Earth.</p> <p>6(i) Explore how changes in the temperature of the atmosphere and the oceans affect the climate.</p> <p>7.6 The Earth is layered with a lithosphere, hot mantle and dense metallic core.</p> <p>7.7 The rock cycle and soil formation are evidence that the Earth is continuously changing.</p> <p>7(g) Explore and describe how the cycling of water in and out of the atmosphere (the water cycle) shapes the face of the Earth.</p> <p>7(h) Explore how heat flow and movement of materials within the Earth cause the rock cycle, earthquakes and volcanic eruptions.</p>	

Grade 8 Science Curriculum: Genetics

<i>Heredity and Evolution – what the processes responsible for life’s unity and diversity?</i>				
STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
8.2 Reproduction is a characteristic of living systems and it is essential for the continuation of every species. <ul style="list-style-type: none"> • Heredity is the passage of instructions specifying traits from one generation to another • Some of the characteristics of an organism are inherited and some result from interacts with the environment. 		C15) Describe the basic structures of an animal cell, including the nucleus, cytoplasm, mitochondria and cell membrane, and how the function to support life. C 25. Explain the similarities and differences in cell division in somatic and germ cells C26. Describe the structure and function of the male and female human reproductive systems, including the process of egg and sperm development. C27. Describe how genetic information is organized in genes on chromosomes, and explain sex determination in humans.		
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
How are certain traits passed from your parents to you? Use your knowledge of dominant and recessive genes in your explanation. CT Frameworks <ul style="list-style-type: none"> • The Nature of Science • History of Science • Units of Structure and Function • Relationships of Structure and Function • Cycles of Life • Science and Technology Extension Activities: Trihybrids, <u>The Double Helix</u> by Francis and Crick. Protein synthesis	Basic Genetics Identify and explain the organelles within plant and animal cells. Explain the similarities and differences in cell division in somatic and germ cells Explain why chromosomes and genes are found in pairs in body cell (somatic cell)s. Explain why sperm and egg only carry half of the genetic information of the parent. Explain how dominant and recessive genes interact	Basic Genetics <ol style="list-style-type: none"> 1. Building a creatures 2. Passing out "B" and "b" gametes (germ cells) and making kids. 	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html

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Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
<p>How are certain traits passed from your parents to you? Use your knowledge of dominant and recessive genes in your explanation.</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> • The Nature of Science • History of Science • Units of Structure and Function • Relationships of Structure and Function • Cycles of Life • Science and Technology <p>Extension Activities: Trihybrids, <u>The Double Helix</u> by Francis and Crick. Protein synthesis</p>	<p>Human Genetics</p> <p>State the number of chromosomes in human body cell (somatic cell)s.</p> <p>State the number of pairs or <u>different kinds</u> of chromosomes in human body cell (somatic cell)s.</p> <p>Explain the cause of Down's syndrome.</p> <p>Identify an autosomal recessive, an autosomal dominant and a sex- linked disease. (Tay Sachs, Cystic Fibrosis, Huntington's disease)</p> <p>Show how the male determines the sex of the child. (punnett square)</p> <p>Determine which human traits are dominant or recessive.</p> <p>Use a punnett square to predict progeny</p>	<p>Human Genetics LAB ACTIVITIES:</p> <p>1) Human Genetics Lab.</p> <p>Note taking Reading Videos Bingo Review games</p>	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p>

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Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
<p>How are certain traits passed from your parents to you? Use your knowledge of dominant and recessive genes in your explanation.</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> • The Nature of Science • History of Science • Units of Structure and Function • Relationships of Structure and Function • Cycles of Life • Science and Technology <p>Extension Activities: Trihybrids, <u>The Double Helix</u> by Francis and Crick. Protein synthesis</p>	<p>Punnett Squares Use a punnett square to discover blood types in the next generation.</p> <p>Use a punnett square to show possible genetic outcomes of crossing single autosomal genes, and sex-linked genes.</p> <p>Use a punnett square to show possible genetic outcomes when crossing two different gene pairs.</p> <p>Predict the 3:1 ratio when breeding 2 hybrids.</p> <p>Create a punnett square for a dihybrid mating and analyze the results.</p> <p>Discover the 9:3:3:1 ratio when breeding 2 Dihybrids.</p>	<p>Drawing Punnett Squares</p> <p>Note taking Reading Videos Bingo Review games</p>	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html

Grade 8 Science Curriculum: Genetics

<i>Heredity and Evolution – what the processes responsible for life’s unity and diversity?</i>				
STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
8.2 Reproduction is a characteristic of living systems and it is essential for the continuation of every species. <ul style="list-style-type: none"> • Heredity is the passage of instructions specifying traits from one generation to another • Some of the characteristics of an organism are inherited and some result from interacts with the environment. 		C15) Describe the basic structures of an animal cell, including the nucleus, cytoplasm, mitochondria and cell membrane, and how the function to support life. C 25. Explain the similarities and differences in cell division in somatic and germ cells C26. Describe the structure and function of the male and female human reproductive systems, including the process of egg and sperm development. C27. Describe how genetic information is organized in genes on chromosomes, and explain sex determination in humans.		
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How are certain traits passed from your parents to you? Use your knowledge of dominant and recessive genes in your explanation. CT Frameworks <ul style="list-style-type: none"> • The Nature of Science • History of Science • Units of Structure and Function • Relationships of Structure and Function • Cycles of Life • Science and Technology Extension Activities: Trihybrids, <u>The Double Helix</u> by Francis and Crick. Protein synthesis	Natural Selection Explain how Darwin’s natural selection differs from Lamarck’s view of evolution. Discuss how the evolution works.	Natural selection LAB ACTIVITY: The peppered moth. Note taking Reading Videos Bingo Review games	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html

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Genetics Review →	7(d) Explore and describe the structures and function of a basic animal cell (e.g., nucleus, cytoplasm, mitochondria, and cell membrane.) 7(e) Explore and explain how materials move in and out of the cell through passive and active transport processes. 7(f) Explore the structures of the human digestive, respiratory, and circulatory systems, and describe how they function to support life.
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Grade 8 Science Curriculum: Flight Inquiry

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<p>Why is it important to control all variables except the one you are testing?</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> The Nature of Science The Earth's atmosphere Energy Interaction of Matter and Energy Science and Technology <p>Other Challenges:</p> <p>Students will make a device that will bring a ball to a certain location.</p> <p>Students will devise a car that has the most power.</p> <p>Students will create paper tubes that will hold the most weight, Students will create windmills that will be the most powerful.</p>	<p>Terminal Velocity Explain the factors that determine terminal velocity.</p> <p>HELICOPTERS Create a device out of paper that rotates in a clockwise manner as it falls to the ground. Create a device out of paper that rotates in a clockwise manner as it falls to the ground and falls slower than 80 cm/second. Use the equation: Velocity = Distance/ Time Control variables and test how blade-width affects flight time. Control variables and test how blade-length affects flight time. Determine aspect ratio of each helicopter tested.</p>	<p>Terminal Velocity Activities:</p> <p>1 Terminal velocity of a paper clip laden coffee filter.</p> <p>2 Graph: velocity vs. weight.</p> <p>HELICOPTERS</p> <p>1 See the objectives.</p> <p>2 How aspect ratio affects flight time.</p> <p>Hypothesizing Experimenting Observing Concluding Writing</p>	<ul style="list-style-type: none"> Rubrics for each student/teacher generated project Teacher observations Unit Quizzes/Tests Homework Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p> <p>http://www.nasa.gov/</p> <p>http://www.modelaircraft.org/education.aspx</p>

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Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
<p>Why is it important to control all variables except the one you are testing?</p> <p>CT Frameworks</p> <ul style="list-style-type: none"> The Nature of Science The Earth's atmosphere Energy Interaction of Matter and Energy Science and Technology <p>Other Challenges:</p> <p>Students will make a device that will bring a ball to a certain location.</p> <p>Students will devise a car that has the most power.</p> <p>Students will build a tower out of paper.</p>	<p>HELICOPTERS</p> <p>Choose one modification and use the scientific method to discover its effects on the flight time of their helicopter.</p> <p>Write a lab report that clearly states their initial question, modification, final results, and conclusion.</p> <p>Make a modification that will beat the control helicopter's velocity of ~ 77 cm/second. This is a performance assessment test.</p>	<p>Hypothesizing Experimenting Observing Concluding Writing</p>	<ul style="list-style-type: none"> Rubrics for each student/teacher generated project Teacher observations Unit Quizzes/Tests Homework Performance assessment 	<p>http://www.mansfieldct.org/schools/mms/staff/hand/index.html</p> <p>http://www.nasa.gov/</p> <p>http://www.modelaircraft.org/education.aspx</p>

Grade 8 Science Curriculum: Reproduction

<i>Heredity and Evolution – what the processes responsible for life’s unity and diversity?</i>				
STATE FRAMEWORK CONTENT STANDARDS:		EXPECTED PERFORMANCES (CMT CORRELATION):		
8.2 Reproduction is a characteristic of living systems and it is essential for the continuation of every species. <ul style="list-style-type: none"> • Heredity is the passage of instructions specifying traits from one generation to another • Some of the characteristics of an organism are inherited and some result from interacts with the environment. 		C15) Describe the basic structures of an animal cell, including the nucleus, cytoplasm, mitochondria and cell membrane, and how the function to support life. C 25. Explain the similarities and differences in cell division in somatic and germ cells C 26. Describe the function of the male and female human reproduction system, including the process of egg and sperm production C 27. Describe the structure of the genes on chromosomes, and explain sex determination in humans.		
Unit w/ Essential Questions	Learning Objectives	Activities	Assessment Strategies	Resources
How does the pituitary gland regulate the development of sperm? How does the pituitary gland regulate the development of ova? How are the hormones of men and women different? How are they similar? CT Frameworks <ul style="list-style-type: none"> • History of Science • Units of structure and function • Relationships of Structure and function • Cycles of life • Science and technology 	Identify and explain the organelles within plant and animal cells. The student will be able understand the function of the following: Pituitary Gland, Luteinizing Hormone, FSH, Testosterone, Estrogen, Urethra, Testicles, Seminiferous Tubules, Testosterone, Seminal Vesicle, Scrotum, Cowper's, Prostate, Vas Deferens, Erection, Acrosome, Sperm, Semen, Penis, Spermatogenesis, Epididymis, Secondary Sexual Characteristics, Bladder, Cervix, Inguinal Canal, Estrogen, Follicles, Corpus Luteum, Fallopian tube, Clitoris, Corpus Luteum, Hymen, Endometrium, Myometrium, Vagina, Uterus, Cervix. Know the stages of embryonic development and birth.	Note taking Reading Videos Bingo Review games	<ul style="list-style-type: none"> • Rubrics for each student/teacher generated project • Teacher observations • Unit Quizzes/Tests • Homework • Performance assessment 	http://www.mansfieldct.org/schools/mms/staff/hand/index.html

Grade 8	
Core Themes, Content Standards and EXPECTED PERFORMANCES (CMT Correlation)	
Content Standards	EXPECTED PERFORMANCES (CMT Correlation)
<p><i>Forces and Motion – What makes objects move the way they do?</i></p> <p>8.1 An object’s inertia causes it to continue moving the way it is moving unless it is acted upon by a force to change its motion.</p> <ul style="list-style-type: none"> • The motion of an object can be described by its position, direction of motion and its speed. • An unbalanced force, acting on an object changes its speed or direction of motion, or both. • Objects moving in circles must experience force acting toward the center. 	<p>C 22. Calculate average speed of a moving object and illustrate the motion of objects in graphs of distance over time.</p> <p>C 23. Describe the qualitative relationships among force, mass and changes in motion.</p> <p>C 24. Describe the forces acting on an object moving in a circular path.</p>
<p>8.2 Reproduction is a characteristic of living systems and it is essential for the continuation of every species.</p> <ul style="list-style-type: none"> • Heredity is the passage of instructions specifying traits from one generation to another • Some of the characteristics of an organism are inherited and some result from interacts with the environment. 	<p>C15) Describe the basic structures of an animal cell, including the nucleus, cytoplasm, mitochondria and cell membrane, and how the function to support life.</p> <p>C 25. Explain the similarities and differences in cell division in somatic and germ cells</p> <p>C 26. Describe the function of the male and female human reproduction system, including the process of egg and sperm production</p> <p>C 27. Describe the structure of the genes on chromosomes, and explain sex determination in humans.</p>
<p>8.3.a Gravity is the force that governs the motions of objects in the solar system.</p> <p>8.3.b The motion of the Earth and moon relative to the sun causes daily, monthly and yearly cycles on the Earth.</p>	<p>C 28. Explain the effect of gravity on the orbital movement of planets in the solar system.</p> <p>C 29. Explain how the regular motion of the sun, earth and moon explains the seasons, phases of the moon and eclipses.</p>
<p>Science and Technology in Society – How do science and technology affect the quality of our lives?</p> <p>8.4 In the design of structures there is a need to consider factors such as function, materials, safety, cost and appearance.</p> <ul style="list-style-type: none"> • Bridges can be designed in different ways to withstand certain loads and potentially destructive forces. 	<p>C 30. Explain how beam, truss and suspension bridges are designed to withstand the forces that act on them.</p>