

Michigan's
Science
Standards and Benchmarks
and
Suggested *AIMS* Activities



Grades

6 - 8

Compiled by
Michigan AIMS Facilitator

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Michigan Science Content Standards and Working Draft Benchmarks and Correlated AIMS Activities

Key to abbreviations and typeface:

Italics indicate the source of the activity. 5.02 means volume 5, number 2 of the AIMS Magazine or Newsletter.

I. Construct New Scientific and Personal Knowledge - Grades 5-7

Content Standard 1:

All students will ask questions that help them learn about the world; design and conduct investigations using appropriate methodology and technology; learn from books and other sources of information; communicate their findings using appropriate technology and reconstruct previous learned knowledge.

How do scientists ask questions that help them learn about the world?

I.1.M.1

C7 Generate scientific questions about the world, based on observation.

Rubber Eggs	1.07
Mealworms Under Glass	<i>Magnificent Microworld Adventures</i>
Night Crawlers.....	<i>Magnificent Microworld Adventures</i>
Jumping Jacks	<i>Magnificent Microworld Adventures</i>
Sea Stars	<i>Magnificent Microworld Adventures</i>
Focus on Scopes	<i>Magnificent Microworld Adventures</i>
The Enormous E	<i>Magnificent Microworld Adventures</i>
Moving In on Protozoa	<i>Magnificent Microworld Adventures</i>
Spinning the Tale	<i>Magnificent Microworld Adventures</i>
Life in Glass Houses	<i>Magnificent Microworld Adventures</i>
A Pretty Rotten Time	<i>Magnificent Microworld Adventures</i>
Algae the Food Factory	<i>Magnificent Microworld Adventures</i>
Blood	<i>Magnificent Microworld Adventures</i>
A Fish Tale	<i>Magnificent Microworld Adventures</i>
Flow Fingers	11.08
Wick Watchers.....	11.03
Fishing Around.....	11.02
Seeing Is Not Observing.....	11.01
Sand Scan.....	12.05

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How do scientists investigate the world to figure out answers to their questions?

I.1.M.2

C8 Design and conduct simple investigations.

Dry Idea.....	<i>Middle Series 2 Binder</i>
Build a Better Magnet	<i>Electrical Connections</i>
Ah Chute	<i>The Sky's the Limit</i>
Pillars of Strength	9.07
What's in a BB?	9.07
Bear-Barrow and Challenge.....	<i>Brick Layers</i>
A Balance Beam	<i>Brick Layers</i>
Have a Ball.....	<i>Popping with Power 96</i>
On the Rebound	<i>Popping with Power 96</i>
From the Ground Up.....	<i>Popping with Power 96</i>
Wheeling Your Way to the Top	<i>Brick Layers</i>
The Big Boom Construction Contest	<i>Brick Layers</i>
Can -Sealed Circuits.....	9.03
All Wrapped up	11.07
The Mirror's Footprint.....	11.02
Droopy Drawers.....	12.06
Life's Up and Downs.....	<i>Floaters and Sinkers 95</i>
Clay Boats.....	<i>Floaters and Sinkers 95</i>

I.1.M.2

C9 Investigate toys/simple appliances and explain how they work, using instructions & appropriate safety precautions.

Circuit Quiz Boards	<i>Electrical Connections</i>
Kite Kaper.....	3.08
Sundial Watches	<i>Pieces and Patterns</i>
Make a Kaleidoscope	4.02
Tooth to Tooth.....	<i>Machine Shop</i>
Sparky's Light Kit	<i>Electrical Connections</i>
Tuning Your Crystal Radio.....	11.04
Wing on a Straw.....	11.01
Ship Wrapped.....	9.9
Deep Sea Diver Relays.....	<i>Floaters and Sinkers 95</i>

I.1.M.3

C10 Use measurement devices to provide consistency in an investigation.

Big Banana Peel.....	<i>Math + Science: A Solution</i>
Going Bananas	1.04
Dry Idea	<i>Middle Series 2 Binder</i>
Volumes of Fun	6.05 & <i>Hardhatting in a Geoworld 96</i>
Icebergs	10.04
Looking for a Liter	10.09
Force Ups	<i>Brick Layers</i>
Dealing with Density	11.06
Sugar Highs.....	12.10
Some Like It Salty	<i>Floaters and Sinkers 95</i>
A Salty Problem.....	<i>Floaters and Sinkers 95</i>

How do scientists learn about the world from books and other sources of information?

I.1.M.4

C11 Use sources of information to help solve problems.

Leaf Facts	<i>Primarily Plants</i>
The Truth about Bananas	<i>Math + Science: A Solution</i>
Fingerprinting	<i>Jawbreakers & Heart Thumpers</i>
Tree Cookies	<i>Our Wonderful World</i>
Energy	<i>Primarily Physics</i>
Food Chain	<i>Critters</i>
Electromagnetism	<i>Electrical Connections</i>
Plant Facts	<i>Budding Botanist</i>
Static Electricity.....	<i>Electrical Connections</i>
Nature's Sound & Light Show.....	<i>Electrical Connections</i>
A Whale in a Drop of Water.....	11.03

How do scientists communicate their findings to other scientists and the rest of society?

I.1.M.5

C12 Write and follow procedures in the form of step-by-step instructions, recipes, formulas, flow diagrams and sketches.

Color Magic	2.01
Wing on a String	3.03
A Tunnel-Less Wind Tunnel	3.03
Easy Glider	3.02
Standard Dart	<i>The Sky's the Limit</i>
Roaming Ranger	<i>The Sky's the Limit</i>
Flying Wing	<i>The Sky's the Limit</i>
Kite Kapers	3.08
Bernoulli was a Bird Brain	<i>The Sky's the Limit</i>
Dry Idea	<i>Middle Level Series 2 Binder</i>
Make a Switch	<i>Electrical Connections</i>
Stars in the Milky Way	8.02
Hot Air Balloons	2.07
Hanging in the Balance	9.10
Layers of the Earth.....	13.01
The Great Cookie Mix-up.....	13.01

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II. Reflect on the Nature, Adequacy and Connections Across Scientific Knowledge Grades 5-7

Content Standard 1:

All students will analyze claims for their scientific merit and explain how scientists decide what constitutes scientific knowledge; how science is related to other ways of knowing; how science and technology affect our society; and how people of diverse cultures have contributed to and influenced developments in science.

How do scientists decided what to believe?

II.1.MS.1

R6 Evaluate the strengths and weaknesses of claims, arguments, or data.
The Orange's Secret..... *Floaters and Sinkers 95*

II.1.M.2

R7 Describe limitations in personal knowledge.

How is science related to other ways of knowing?

II.1.M.3

R8 "Show how common themes of science, mathematics, and technology apply in selected real-world contents."
Homemade Fire Extinguisher *Off the Wall Science*
Sparky's Light Kit *Electrical Connections*
Short Stretches *Upper Series 2 Binder*
Sparky's Light Kit *Electrical Connections*
Put Your Name in Lights *Electrical Connections*
How Much Cargo will It Hold?..... *Floaters and Sinkers 95*
Ship Shape..... *Floaters and Sinkers 95*

How do science and technology affect our society?

II.1.MS.4

R9 Describe the benefits and risks of new technologies or patterns of human activity.

How have people of diverse cultures contributed to and influenced developments in science?

II.1.M.5

R10 Recognize the contributions made in scientific by cultures and individuals of diverse backgrounds.
Antony van Leewenhoek *Magnificent Microworld Adventures*
Robert Hooke *Magnificent Microworld Adventures*
Benjamin Banneker..... *Historical Connections II*

III. Use Scientific Knowledge from the Life Sciences in Real-World Contexts - Grades 5-7

CELLS

Content Standard 1:

All students will apply an understanding of cells to the functions of multicellular organisms; and explain how cells grow, develop and reproduce.

What are cells?

III.1.MS.1

LC2 Describe similarities/differences between single-celled and multicellular organisms.

Cell Facts *Budding Botanist*
 Model of a Cell *Budding Botanist*
 Focus on Cells *Budding Botanist*
 Protozoan a Goin' *9.04*
 Moving in on Protozoa *Magnificent Microworld Adventures*
 At the Heart of Daphnia *Magnificent Microworld Adventures*
 Dropping in on Protozoa *9.04 & Magnificent Microworld Adventures*

III.1.MS.2

LC3 Explain why specialized cells are needed by plants and animals.

Cell your Fruits and Vegetables *Budding Botanist*
 Important Things Come In Tiny Packages *1.07*
 Dead Centers *Magnificent Microworld Adventures*
 Cheek to Cheek *Magnificent Microworld Adventures*
 Onion Rings *Magnificent Microworld Adventures*
 Blood *Magnificent Microworld Adventures*
 A Fish Tale *Magnificent Microworld Adventures*
 A Complete Package *Magnificent Microworld Adventures*

How are cells adapted to survive, grow, develop and reproduce?

III.1.MS.3

LC4 Explain how cells use food as a source of energy.

Photosynthesis *Budding Botanist*
 Green Machine 1 *Magnificent Microworld Adventures*
 Green Machine 2 *Magnificent Microworld Adventures*
 The Cell as a Factory *Magnificent Microworld Adventures*
 Moving in on Protozoa *Magnificent Microworld Adventures*

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ORGANIZATION OF LIVING THINGS

Content Standard 2:

All students will use classification systems to describe groups of living things; compare and contrast differences in the life cycles of living things; investigate and explain how living things obtain and use energy; and analyze how parts of living things are adapted to carry out specific functions.

How are groups of living things classified?

III.2.MS.1

LO6 Compare and classify organisms into major groups on the basis of their structure.

Creature Features	5.05
Sorting Trees	1.09
Leafy Facts Scavenger Hunt	2.02
Unique U	<i>Math + Science: a Solution</i>
Sea Life Shuffle	6.10
Animals of a Sort	10.07
Back Talk	10.09
Seeing to Cetaceans.....	11.05

How do life cycles of living things differ?

III.2.MS.2

LO7 Describe the life cycle of a flowering plant.

Flower Study	<i>Budding Botanist</i>
Test a Seed	<i>Budding Botanist</i>
Dissect a Seed.....	<i>Budding Botanist</i>
Seed from Fruits	<i>Budding Botanist</i>

How do living things obtain and use energy?

III.2.MS.3

LO8 Describe evidence that plants make and store food.

Photosynthesis	<i>Budding Botanist</i>
Transpiration	<i>Budding Botanist</i>

How are the parts of living things adapted to carry out specific functions?

III.2.MS.4

LO9 Explain how selected systems and processes work together in plants and animals.

Leaf Facts	<i>Primarily Plants</i>
Leaves	<i>Budding Botanist</i>
Herb and Woody	<i>Budding Botanist</i>
Twig's Story	<i>Budding Botanist</i>
History of a Tree	<i>Budding Botanist</i>
The Food Tube.....	11.10
Casing the System	11.01
Before and After Assessment – Bats	13.03

HEREDITY

Content Standard 3:

All students will investigate and explain how characteristics of living things are passed on through generations; explain why organisms within a species are different from one another; and explain how new traits can be established by changing or manipulating genes.

How are characteristics of living things passed on through generations?

III.3.MS.1

LH2 Describe how the characteristics of living things are passed through generations.

Teddy Bears come in Pairs	2.05
Traits Combo Extension	6.10
Are you a Square? Extension	<i>Hardhatting in a Geo-world</i> 96
Traits Combo	6.10
Picturing a Dichotomy	9.08

Why are organisms within a species different from one another?

III.3.MS.2

LH3 Describe how heredity and environment may influence/determine characteristics of an organism.

Missing Moths	<i>Critters</i>
A New Plant Discovery	<i>Budding Botanist</i>
Cactus	<i>Budding Botanist</i>

EVOLUTION

Content Standard 4:

All students will explain how scientists construct and scientifically test theories concerning the origin of life and evolution of species; compare ways that living organisms are adapted (suited) to survive and reproduce in their environments; and analyze how species change through time.

How do scientists trace the origin and development of species?

LE3 Describe how biologists might trace possible evolutionary relationships among present and past life forms.

ECOSYSTEMS

Content Standard 5:

All students will explain how parts of an ecosystem are related and how they interact; explain how energy is distributed to living things in an ecosystem; investigate and explain how communities of living things change over a period of time; describe how materials cycle through an ecosystem and get reused in the environment and analyze how humans and the environment interact.

How are parts of an ecosystem related and how do they interact?

III.5.MS.1

LEC6 Describe common patterns of relationships among populations.

III.5.MS.2

LEC7 Predict the effects of changes in one population in a food web on other populations.

Catch Me if You Can	<i>Critters</i>
Nocturnal Hunter	4.05
What's the Net Worth?	10.03

III.5.MS.3

LEC8 Describe how all organisms in an ecosystem acquire energy directly or indirectly from sunlight.

Food Chain of the Pond (song)	8.05
Food Chains & Webs	9.09
Food Chain	<i>Critters</i>

How do communities of living things change over time?

III.5.MS.4

LEC9 Describe the likely succession of a given ecosystem over time.

Pond Today, Meadow Tomorrow	<i>Water Precious Water</i>
The Pickle Jar Aquarium.....	<i>Magnificent Microworld Adventures</i>
Making a Hay Infusion	<i>Magnificent Microworld Adventures</i>
The Hanging Drop	<i>Magnificent Microworld Adventures</i>
Life in Glass Houses	<i>Magnificent Microworld Adventures</i>

How do materials recycle through an ecosystem and get reused in the environment.

III.5.MS.5

LEC10 Identify some common materials that cycle through the environment.

How do humans and the environment interact?

III.5.MS.6

LEC11 Describe ways in which humans alter the environment.

III.5.MS.7

LEC12 Explain how humans use and benefit from plant and animal materials.

Trees as a Crop	<i>Our Wonderful World</i>
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IV. Use Scientific Knowledge From the Physical Sciences in Real-World Contexts - Grades 5-7

MATTER & ENERGY

Content Standard 1:

All students will measure and describe the things around us; explain what the world around us is made of ; identify and describe forms of energy; and explain how electricity and magnetism interact with matter.

How do we describe the things around us?

IV.1.MS.1

PME8 Measure physical properties of objects or substances (mass, weight, temperature, dimensions, area, volume).

Weight Watchers	<i>Math + Science a Solution</i>
Mini Metric Olympics	<i>Math + Science a Solution</i>
Metric Scavenger Hunt	<i>Math + Science a Solution</i>
Make your own Measuring Cup	<i>Water Precious Water</i>
All Bottled Up	<i>Water Precious Water</i>
Volumes of Fun	<i>Hardhatting in Geoworld 96</i>
Sink or Swim	9.08
All Wrapped Up.....	11.07
What's in a BB?	9.07
Which Way is Up?	<i>Floaters and Sinkers 95</i>
Can You Tell?.....	<i>Floaters and Sinkers 95</i>
Tin Can Space.....	<i>Floaters and Sinkers 95</i>
Displaced Object.....	<i>Floaters and Sinkers 95</i>
Fill 'er up Gravel.....	<i>Floaters and Sinkers 95</i>
Fill 'er up Sand.....	<i>Floaters and Sinkers 95</i>
One Way or Another.....	<i>Floaters and Sinkers 95</i>
Will It Float?.....	<i>Floaters and Sinkers 95</i>
Play Ball	<i>Floaters and Sinkers 95</i>

IV.1.MS.2

PME9 Describe when length, mass, weight, area, or volume are appropriate to describe the size of an object or the amount of a substance.

Massive Boxes.....	<i>Floaters and Sinkers 95</i>
Mass-ter Minds.....	<i>Floaters and Sinkers 95</i>

IV.1.MS.3

PME10 Classify substances as elements, compounds, or mixtures.

Messing with Mixtures.....	12.07
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What is the world around us made of?

IV.1.MS.4

PME11 Describe matter as consisting of extremely small particles (atoms) which bond to form molecules.

Water Molecule	<i>Water Precious Water</i>
Macro Molecules	<i>Soap Films & Bubbles</i>
Atoms	<i>Electrical Connections</i>
It's a Small World	<i>Soap Films and Bubbles</i>
Fork in the Road	10.01
Make Room for Me!	10.02

IV.1.MS.5

PME12 Describe the arrangement and motion of molecules in solids, liquids, and gases.

Moving Molecules	<i>Water Precious Water</i>
Color Magic	2.01
Kool Aid Kaper	3.05
Taking a Jab at Rice.....	12.04
Solidifying Sand	13.04
Don't Flip Your Lid.....	13.01
A Salty Solution.....	<i>Floaters and Sinkers 95</i>

What is energy?

IV.1.MS.6

PME13 Describe energy and the many common forms it takes (mechanical, heat, light, sound, electrical, magnetic, chemical, nuclear).

What is Energy?	<i>Primarily Physics</i>
What is Heat?.....	<i>Primarily Physics</i>
What is Light?	<i>Primarily Physics</i>
What is Sound?	<i>Primarily Physics</i>
Hot Pocket	13.02

IV.1.MS.7

PME14 Describe how common forms of energy can be converted, one to another.

Burning Walnut	<i>Off the Wall Science</i>
Photosynthesis	<i>Budding Botanist</i>
Electromagnetic Connection	<i>Electrical Connections</i>
All Fired Up	9.09
Tints and Temps	10.01
Cold Comfort	12.06
Zapped.....	13.01

How do electricity and magnetism interact with matter?

IV.1.MS.8

PME15 Describe electron flow in simple electrical circuits.

Path Finders	<i>Electrical Connections</i>
Make a Switch	<i>Electrical Connections</i>
Sparky's Light Kit	<i>Electrical Connections</i>
Bridging the Gap	9.04
Can-Sealed Circuits	9.03
Circuit Quiz Board	<i>Electrical Connections</i>
Electric Circuits.....	<i>Electrical Connections</i>
Short Cuts.....	<i>Electrical Connections</i>
Circuit Breakers	<i>Electrical Connections</i>

IV.1.MS.9

PME16 Use electric currents to create magnetic fields.

Electromagnetic Connection	<i>Electrical Connections</i>
Electromagnetism	<i>Electrical Connections</i>
Make an Electromagnet	<i>Mostly Magnets</i>
Build a Better Magnet	<i>Electrical Connections</i>

CHANGES IN MATTER

Content Standard 2:

All students will investigate, describe and analyze ways in which matter changes; describe how living things and human technology change matter and transform energy; explain how visible changes in matter are related to atoms and molecules; and how changes in matter are related to changes in energy.

How does matter change?

IV.2.MS.1

PCM4 Describe common physical changes in materials: evaporation, condensation, thermal expansion, & contraction.

Moving Molecules	<i>Water Precious Water</i>
MiniWater Cycle	<i>Water Precious Water</i>
Dry Idea.....	<i>Middle Series 2 Binder</i>
I Scream	<i>Fun with Foods</i>
Hot Air Balloon	2.07
Gem of an Experience	8.05
Make a Thermometer	<i>Primarily Physics</i>
Hot Meets Cold	<i>Primarily Physics</i>
Drip on a String	<i>Bats Incredible</i>
Fabulous Fountain.....	11.06
Dealing with Density	11.06
Icy Conditions	12.08

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IV.2.MS.2

PCM5 Describe common chemical changes in terms of properties of reactants and products.

Homemade Fire Extinguisher	<i>Off the Wall Science</i>
Rubber Eggs	1.07
Test a Seed	<i>Budding Botanist</i>
Curds and Weigh	9.03
Give Me an Indication	8.02
How Sweet It Is	<i>Fun with Foods</i>
Pouring Carbon Dioxide Gas	<i>Off the Wall Science</i>
Red C	<i>Fun with Foods</i>
Feel the Heat	10.10
Using Technology with Feel the Heat	12.01
Change Matters.....	11.08
A Strange Change.....	11.10
Basic Indications.....	11.05

How do living things (and human technology) change matter and transform energy?

IV.2.MS.2

PCM6 Distinguish between physical and chemical changes in natural and technological systems.

IV.2.MS.3

PCM7 Describe how waste products accumulating from natural and technological activity create pollution.

How are visible changes in matter related to changes in atoms and molecules?

IV.2.MS.4

PCM8 Explain physical changes in terms of the arrangement and motion of atoms and molecules.

Moving Molecules	<i>Water Precious Water</i>
Mini Water Cycle	<i>Water Precious Water</i>
Gem of an Experience	8.05

MOTIONS OF OBJECTS

Content Standard 3:

All students will describe how things around us move and explain why things move as they do; demonstrate and explain how we control the motions of objects; and relate motion to energy and energy conversions.

How do things move around us?

IV.3.MS.1

PMO4 Qualitatively describe and compare motions in three dimensions.

Be a Roto Promotor	<i>Sky's the Limit</i>
Easy Glider	3.02
Roll er Up.....	11.01

Why do things move as they do?

IV.3.MS.2

PMO5 Relate changes in speed or direction to unbalanced forces in two dimensions.

Kite Kapers	3.08
Canopy Pilot	9.08
Hanging in the Balance	9.10
Level the Lever	10.06
MVP-Most Valuable Place.....	<i>Brick Layers</i>
Fiddling with Fulcrums.....	<i>Brick Layers</i>
Beams Overboard	<i>Brick Layers</i>
Effort-Less.....	<i>Brick Layers</i>
Cycloids	<i>Brick Layers</i>
Bug on a Roll	<i>Brick Layers</i>
Bug - a - long	<i>Brick Layers</i>
Speed Bug	<i>Brick Layers</i>
Stable Structures	<i>Brick Layers</i>
A Stable Table	<i>Brick Layers</i>
Angle Fixer	<i>Brick Layers</i>
Stress on a String	<i>Brick Layers</i>
Tug Teams	11.07
Clever Lever 1, 2 & 3.....	<i>Machine Shop</i>
Kinetic Straws.....	11.08
Whack the Stack.....	11.07
Tug Teams	11.07
Pushes and Pulls.....	11.07
Balloon on a Straw	11.05
Tilt Tube	11.03
Roll er Up.....	11.01
A Pirate's Pendulum.....	12.01
Stream Lined.....	12.09
Brick Slide.....	12.03
Water Snakes.....	13.03

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IV.3.MS.3

PMO6 Describe the forces exerted by magnets, electrically charged objects, and gravity.

Static Magic	<i>Popping with Power</i>	96
Balance Your Charge Account	<i>Electrical Connections</i>	
Holding Power	<i>Mostly Magnets</i>	
Weightless Wonder		10.08
Balancing Bats		11.03
A Coffee Can Gravitational Field Simulator		11.02
Have a Ball.....	<i>Popping with Power</i>	96
On the Rebound	<i>Popping with Power</i>	96
From the Ground Up	<i>Popping with Power</i>	96

How can we control the motions of objects?

IV.3.MS.4

PMO7 "Design strategies for moving objects by application of forces, including the use of simple machines."

Gearing Up Gears	<i>Machine Shop</i>	
One Good Turn Deserves Another	<i>Machine Shop</i>	
Winding Wheels		8.06
Hang Gliding		9.10
Turn Around	<i>10.02 and Brick Layers</i>	
Magic String	<i>10.06 and Brick Layers</i>	
A First Class Job		10.08
Force ups	<i>Brick Layers</i>	
MVP-Most Valuable Place	<i>Brick Layers</i>	
Fiddling with Fulcrums	<i>Brick Layers</i>	
Beams Overboard	<i>Brick Layers</i>	
Effort-Less	<i>Brick Layers</i>	
Wheeling Your Way to the Top.....	<i>Brick Layers</i>	
A Shift in Lift.....	<i>Brick Layers</i>	
Slot Cars	<i>Brick Layers</i>	
LEGO® Launcher.....	<i>Brick Layers</i>	
Reel Changes	<i>Brick Layers</i>	
Dial-a-Gear	<i>Brick Layers</i>	
The Governor Rules	<i>Brick Layers</i>	
Gear Guessing	<i>Brick Layers</i>	
The Big Boom Construction Contest	<i>Brick Layers</i>	
Sand Bagging the See Saw	<i>Machine Shop</i>	
Meet the Equalizer	<i>Machine Shop</i>	
Block and Tackle.....	<i>Machine Shop</i>	
Nuts and Bolts.....	<i>Machine Shop</i>	
Clever Lever 1, 2, 3	<i>Machine Shop</i>	
Catapults.....		11.09
Give me a Lift		12.04
Blow Up		13.01
Slip Sliding Away		13.03
Inclined to Work		12.08

WAVES & VIBRATIONS

Content Standard 4:

All students will describe sounds and sound waves; explain shadows, colors, and other light phenomena; measure and describe vibrations and waves; and explain how waves and vibrations transfer energy.

How can we describe sound?

IV.4.MS.1

PWV6 Explain how sound travels through different media.

Traveling Sounds *Primarily Physics*

IV.4.MS.2

PWV7 Explain how echoes occur and how they are used.

Sensational Ears *Bats Incredible*

Family Sense *Bats Incredible*

Hide and Seek *Bats Incredible*

Information about Echolocation *Bats Incredible*

Make believe Bats *Bats Incredible*

Click, Click. Who's There? 10.03

How can we describe light?

IV.4.MS.3

PWV8 Explain how light helps us to see.

From Rays to Reasons 8.05

IV.4.MS.4.

PWV9 Explain how objects or media reflect, refract, transmit, or absorb light.

The Mysterious Penny 9.10

Glow with the Flow 10.01

Reflections of Ray 10.10

Bobbing for Light 11.04

The Mysterious Penny 9.10

Clownin' Around 12.01

An Oily Illusion 12.05

Slides of Refraction 13.03

How can we describe and measure vibrations and waves?

IV.4.MS.5

PWV10 Describe the motion of pendulums or vibrating objects (frequency, amplitude).

Swing in time 11.04

Threads of Time 11.4

Swinging Bears 4.08 or *Popping with Power*

Galileo & Pendulum 4.08

Heartbeats and Pendulums *Historical Connections 1*

Code: *Italics* indicate the source of the activity. 5.02 means volume 5, number 2 of the AIMS Magazine or Newsletter.

How do waves and vibrations transfer energy?

IV.4.MS.6

PWV11 Explain how waves transmit energy.

Wave article	4.02
Roller Coaster & Bumper Cars	9.06
How Sweet It Is	10.09

V. Use Scientific Knowledge from the Earth and Space Sciences in Real World Contexts - Grades 5-7

GEOSPHERE

Content Strand 1:

All students will describe the earth's surface; describe and explain how the earth's features change over time; and analyze effects of technology on the earth's surface and resources.

What is the earth's surface like?

V.1.MS.1

EG7 Describe and identify surface features using maps.

Were You Aware?	<i>Water Precious Water</i>
Surf and Sand Toss	<i>Finding Your Bearings</i>
Surf and Sand Spin	<i>Finding Your Bearings</i>
Surf and Sand Count	<i>Finding Your Bearings</i>
Topping off Mt. St. Helens	<i>Through the Eyes of Explorers</i>
Space Maps	<i>Through the Eyes of Explorers</i>
Mystery Mountain	<i>Finding Your Bearings</i>
Squiggle Summit.....	12.02

How do the earth's features change over time?

V.1.MS.2

EG8 Explain how rocks and minerals are formed.

Gem of an Experience	8.05
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V.1.MS.3

EG9 Explain how rocks and fossils are used to determine the age and geological history of the earth.

Rate of Decay	8.07
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V.1.MS.4

EG10 Explain how rocks are broken down, how soil is formed, and how surface features change.

Ice Breakers	8.09
Craters	10.03
Soil Tables	10.08

What effect has technology had on the earth's surface and resources?

V.1.MS.5

EG11 Explain how technology changes the surface of the earth.

What on Earth Can We Do?*Down to Earth*

HYDROSPHERE

Content Standard 2:

All students will demonstrate where water is found on earth; describe the characteristics of water and how water moves; analyze the interaction of human activities with the hydrosphere.

Where is water found on the earth and what are its characteristics?

V.2.MS.1

EH5 Describe various forms that water takes on the earth's surface and conditions under which they exist.

Were you Aware?*Water Precious Water*

Surf and Sand Toss*Finding your Bearings*

Surf and Sand Count*Finding your Bearings*

Surf and Sand Spin*Finding your Bearings*

How does water move?

V.2.MS.2

EH6 Describe how rain water in Michigan reaches the oceans.

Moving Molecules*Water Precious Water*

Moving Water*Water Precious Water*

How do human activities interact with the hydrosphere?

V.2.MS.3

EH7 Describe the origins of pollution in the hydrosphere.

A Little Cup will Do It.*Water Precious Water*

Water Treatment.....*Water Precious Water*

Water Drop Census*4.02*

ATMOSPHERE AND WEATHER

Content Standard 3:

All students will investigate and describe what makes up weather and how it changes from day to day, from season to season and over long periods of time; explain what causes different kinds of weather; and analyze the relationships between human activities and the atmosphere.

Where is water found on the earth and what are its characteristics?

V.3.MS.1.

EAW5 Describe the composition and characteristics of the atmosphere.

Temperature Rate *Down to Earth*
 Forecast for Today *Finding your Bearings*
 Layers of Our Atmosphere..... *12.08*

V.3.MS.2

EAW6 Describe patterns of changing weather and how they are measured.

Weather Watch *10.02*
 World Wide Highs..... *11.05*
 Green Sleeves..... *12.02*

What causes different kinds of weather?

V.3.MS.3

EAW7 Explain the water cycle and its relationship to weather patterns.

Mini Water Cycle *Water Precious Water*
 Moving Water *Water Precious Water*
 In a Fog *8.06*
 Nature's Sound and Light Show *Electrical Connections*

What are the relationships between human activity and the atmosphere?

V.3.MS.4

EAW8 Describe health effects of polluted air.

Every Breath You Take *Down to Earth*
 What's in the Air? *Our Wonderful World*

SOLAR SYSTEM, GALAXY AND UNIVERSE

Content Standard 4:

All students will compare and contrast our planet and sun to other planets and star systems; describe and explain how objects in the solar system move; explain scientific theories as to the origin of the solar system; and explain how we learn about the universe.

How does our planet and sun compare to other planets and star systems?

V.4.MS.1

ES3 Compare the earth to other planets in terms of supporting life.

Can You Planet?	<i>Out of this World 94</i>
Planetary facts	<i>Out of this World 94</i>
Extra Terrestrial Excursions	<i>Out of this World 94</i>

How do objects in the solar system move?

V.4.MS.2

ES4 Describe, compare, and explain the motions of planets, moons, and comets in the solar system.

Me and My Shadow	<i>Pieces and Patterns</i>
Sun Watchers	<i>Pieces and Patterns</i>
A Handy Timepiece	9.04
Sizing Up Shadows	<i>Through the Eyes of Explorers</i>
Pasta Parallels	9.06
Facing Up to the Moon	10.08
Apparent Sizes	11.04

V.4.MS.3

ES5 Describe and explain common observations of the day and night skies.

The Moon shines Bright	<i>Out of this World 94</i>
Sun Watchers.....	<i>Pieces and Patterns</i>

How did the universe begin?

V.4.MS.4

ES6 Explain how the solar system formed.