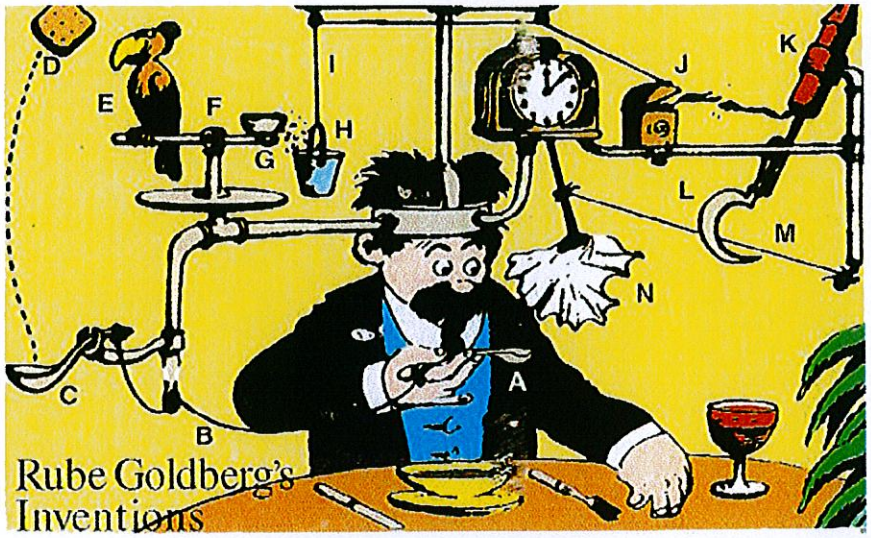
Salute to Rube Goldberg!



Mrs. Rosa Perez-Rubi
rubirose@dadeschools.net

Zelda Glazer Middle School
School Mail : 6052

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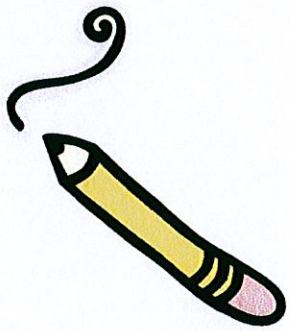


Goals / Objectives

6th grade

-Potential and Kinetic Energy (S.C.6.P11.1)
-Energy Transfers and the Law of Conservation of Energy (S.C.6.P11.1)
-Motion of Objects (S.C.6.P.12.1)
-Types of Forces (S.C.6.P.13.1)
-Law of Universal Gravitation (S.C.6.P.13.2)
-Forces and Motion (S.C.6.P.13.3)
-Nature of Science (S.C.6.N.1.1 thru S.C. 6.N.1.7)

7th grade

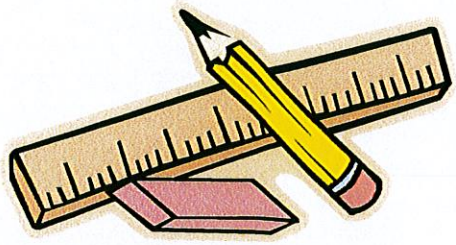
-Conservation of Energy and Energy Transformations (S.C.P.11.2 and S.C.7.P.11.3)
-Properties of Waves (S.C.7.P.10.1)
-Properties of Light (S.C.7.P.10.2 and S.C.7.P.10.3)
-Nature of Science (S.C.6.N.1.1 thru S.C. 6.N.1.7)

8th grade

-Matter (S.C.8.P.8.2 and S.C.8.P.8.3)
-Nature of Science (S.C.6.N.1.1 thru S.C. 6.N.1.7)

Physical Science Honors (Appendix A)

-Measurement
-Motion
-Forces
-Energy
-Sound and Light
-Work and Machines
-Nature of Science



Salute to Goldberg

Students will use their knowledge of the Law of Conservation of Energy, energy transfers (potential, kinetic, mechanical, sound, etc.), transformations, and simple machines for this activity. In groups, students will design, build, and test a Rube Goldberg Contraption of their own making.

Teams of students will select common materials to create complex inventions that perform a simple task/goal: either ringing a bell, popping a balloon/s, starting a chemical reaction (like baking soda and vinegar) or capturing an object.

Teams of students will evaluate their inventions according to pre-set scoring criteria. The activity is divided into four steps—Brainstorming, Planning, Building and Scoring the Device. The value of this activity resides in the efforts of the students to devise their own plan.

Materials

You will need a variety of materials for each group.

Contraption materials: Bamboo skewers, straws, balloons, tacks, white vinegar, plastic cups, baking soda, duct tape, aluminum foil, Ping-Pong balls, clay, dominoes, cardboard, bell, construction paper, toy cars, poster board, rubber bands, marbles (large and small), etc.

Approximate Time

You will probably wish to allocate at least 90 minutes for planning and testing ideas, and at least 90 minutes for building, testing, refining and discussing final designs. However, depending on the amount of time required for background explorations, the materials available and the students' needs and interests, spending more time on this activity might well be worthwhile.

Lesson Procedures

1. Discuss who Rube Goldberg was, his biography *(www.rubegoldberg.com)*
2. Ask students if they have seen any contraptions in everyday life similar to this.
3. Have students get into groups
4. Go over steps and procedures of the activity (**SEE**: Contraption Challenge Handout)
5. Begin to plan/brainstorm contraption

CONTRAPTION CHALLENGE

1. You may use as many of the materials available for your contraption.

2. Your group's score for the device will be based upon the number of **energy transfers** and **energy conversions** it contains. Each **transfer** is worth 5 points; each **conversion** is worth 10 points. You need a minimum of three transfers and conversions. Each additional transfer and/or conversion gets an additional 5 points.

A. **Energy transfer** means that energy of a particular type is transferred from one object to another.

B. **The simple machines** are: the lever, the inclined plane, and the pulley. Five points for each type of simple machine throughout.

C. **Energy conversion** means that one type of energy is changed into another type. For example, an electric motor converts electrical energy to mechanical energy.

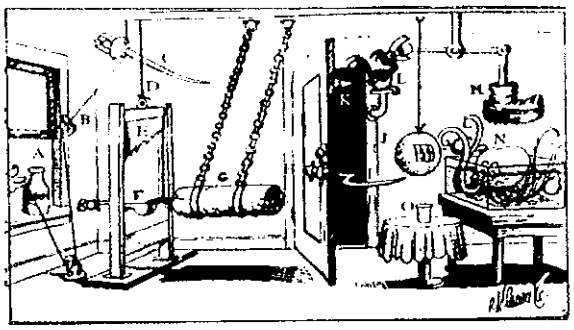
3. In order to receive credit for a transfer or conversion, it must be identified in your plan.

4. Your contraption needs to have a name along with your team's names.

5. You will be allowed three opportunities to meet your goal. If you meet your goal on the
first try you will receive 20 points, on the second try 10 points, and 5 points on the third try. If you do not meet your goal you will be awarded 0 points.

6. You must present your contraption orally to the class explaining your contraption along with the transfers, conversions, and simple machines.

7. All conversions, transfers, simple machines, and goal must be clearly visible to the audience during the presentation.



Names_____

Sketch your design for a Rube Goldberg machine and label its parts.

What is the ultimate goal for your machine?

_____

What simple machines did you incorporate?

_____

How many steps did you use? _____

List and describe the steps

Roller Coaster Design

A new amusement park is looking for a group of innovative engineers to design their fastest and coolest Roller Coaster Adventure Ride ever! It is up to your team to design and present your idea to the managers of the amusement park.

Materials: *(each group should have all of the following items)*
Two pieces of 2 meter foam "track", two Styrofoam cups, stopwatch, poster, construction paper, two marbles (one large and one small), and a roll of masking/painter's tape

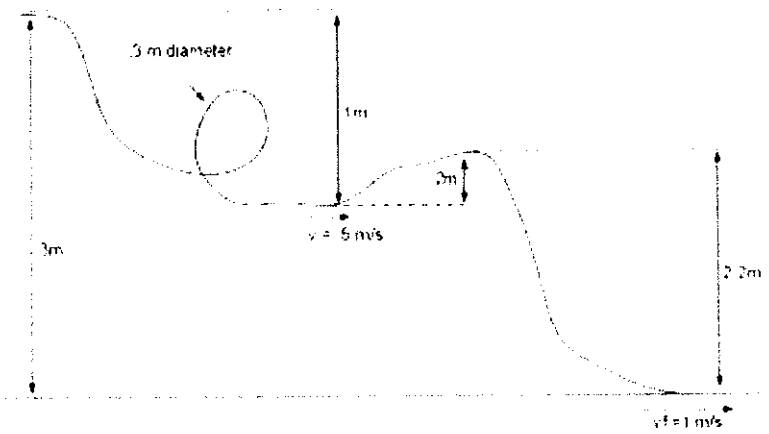
Procedures:
1. Your coaster must have at least one loop
2. Your coaster must be free standing – you can use tape, walls, chairs, or cups
3. The marble must be able to travel the entire course without flying out of control
4. Use the large marble, measure the amount of time (in seconds) it takes for your marble to travel the entire course of the coaster. This is your travel time.
5. Repeat with the small marble
6. Design your coaster on poster/construction paper.
    a. Name your coaster
    b. Label all forms of energy involved in your coaster (ex: potential, kinetic, etc)
    c. Your team's name.
7. Present your coaster to the class

Answer the following questions:
1. Imagine that you were to raise the height of your starting point by 50 cm. Would this change affect the travel time of your marble? Would it increase or decrease travel time? Justify your answer
2. Does the size of the marble affect the travel time?
3. How does the small marble and large marble compare in travel time?
4. What is friction?
5. Do you want more or less friction in your coaster?
6. Does friction affect travel time?
7. How would you modify your current design to make it faster?

Make sure to include in your design the following:

☐ Height measurements for starting points and hills, if any.
☐ Loop diameters
☐ All energy calculations (bar charts and mathematical calculations)
☐ Total length of track
☐ Predicted speed at the end of track
☐ Uncertainty in all measurements and effects on results

"Sample Design"



Final Team Score

Total Loop/s Diameter in cm: _____

Hills: _____

Aesthetic Rating: _____(1-6, 1 having the best look).

Total Length of track: _____

Time to complete track: _____

Average Velocity: (Track length/time)_____

What's the Frequency, Roy G. Biv?

Students will discover and verify the relationship between Wavelength and Frequency of the Electromagnetic Spectrum

Materials: manila folder, colored pencils, stopwatch, calculator, paper, pencil machine tape roll, metric ruler, tape

Procedures:

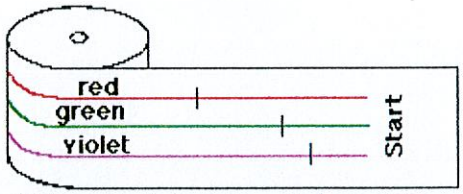
1. Materials Manager retrieves all materials listed from teacher.

2. Recorder should draw a vertical line about 20 cm from the beginning of the adding machine tape and label it "Start" (see below). With the metric ruler, make a point 100 cm from the starting point. Draw a vertical line and label it "End". Cut the tape off of the roll leaving about 20 cm space between "End" and where you cut.

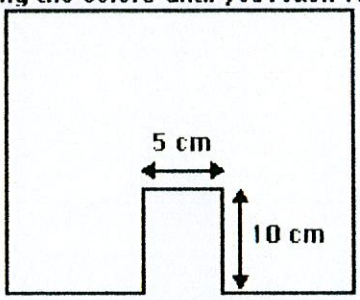
3. Materials Manager should use the colored pencils to draw three evenly spaced (1 cm between each) horizontal lines along the tape from Start to End. Make the top line red, the middle line green and the bottom line violet to represent three different colors in the spectrum of light.

5. Recorder should divide the red line every 14 cm with dark marks in red pencil. The green line should be divided every 10 cm and the violet every 8 cm. The marks that you make on the three color lines will represent the different wavelengths of the different colors of light.

   (The true wavelengths are actually measured in terms of Angstroms. An angstrom is 10^{-8} cm or 0.00000001 cm. Red has a wavelength of 7800-6220 Angstroms, green has a wavelength of 5770-4920 Angstroms and violet has a wavelength of 4550-3900 *Angstroms. However, in this lab, the simple relationship among the visible light waves will be what is important.)*



Note: This is how to get started, keep labeling the colors until you reach 100 cm.



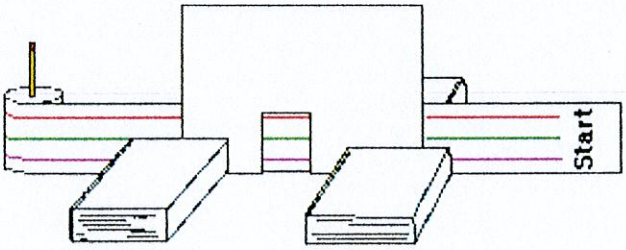
1. Materials Manager should use masking tape to fasten the marked adding machine tape to a pencil.

2. Recorder should cut a manila folder along its crease. Then cut a rectangle out of the center of one of the long sides. This rectangle should be about 10 cm high and 5 cm wide as shown above.

3. Materials Manager should set the manila folder cut out on the table supporting it with the four books (see below). Feed the end of the adding machine tape through the narrow space between the manila folder and the two back books until "Start" appears in the middle of the opening in the manila folder.

4. Recorder should now be prepared with the Data Table and sit in front of the tape and manila folder model.

5. Time Keeper should call "start" and begin timing as he or she slowly pulls the tape along. Try to pull the tape at about the same speed for every trial!



6. Recorder should tally in the appropriate box on the data table every time he or she sees a wavelength mark. When "End" appears, tell the Time Keeper to stop timing.

7. Each group should make a "trial run" and then repeat the procedure an additional 3 times.

8. On the data table, Materials Manager determines and records the average number of wavelengths observed for each color and the average time (in seconds) from start to finish.

9. Recorder should determine and record the frequency for each of your colored light waves. Note: frequency is defined as the number of wavelengths passing a given point per second.

10. Have students graph their results

"Sample Data Table"

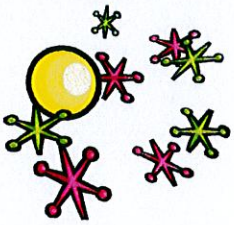
	Trial 1		Trial 2		Trial 3	
	Tally	Total	Tally	Total	Tally	Total
Red						
Blue						
Violet						
Average						
Time						
Frequency						

Physical Science
Extension Ideas and Activities

Balloon Powered Race Cars
There are many variations to this activity. Students can create their own scientific investigation by seeing if different sizes of wheels or shape of vehicle will allow a car to travel the farthest/fastest. The materials used are Styrofoam trays for the body and wheels (or any other material), push pins to hold the wheels in place, balloons, meter stick, masking tape and flexi straws. The car must be powered by no more than 2 balloons and capable of traveling at least 5 meters. Cars will be weighed as well to see if mass made a difference in the results.

Pendulums
Students create a pendulum with a string and washer. Students can investigate whether the size of the string or the amount of washers will allow for one complete swing within a given time. The materials used are string, washers, pencil, stopwatch and masking tape.

Energy at Play
Emerald Toy Company has decided to hold a contest for a new ball machine. Your challenge is to build a simple toy with its own propulsion mechanism that will move a ball at least 5 inches (without using your energy to directly move it). The toy must store and transform energy in some way for the ball to move. The materials used are rubber bands, popsicle sticks, cups of various sizes, rubber balls, ping pong balls, tape, marble, etc. (various random materials). Students must also prepare a pamphlet advertising their new toy, with the name of the toy, the age appropriateness of the toy, price, design of toy, and how the device uses energy, forces, and motion (may be labeled on design or written explanation).



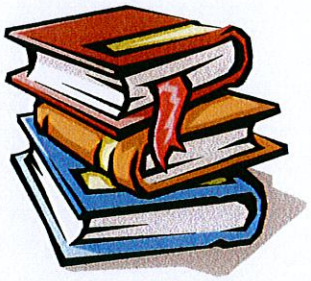
Olympic Challenge

Students can have their own Olympics at school. Students can get in teams and compete against each other in various challenges. Teacher can create various challenges for the students that will require distance, time and speed. Students can speed walk, walk backwards, hop/or skip to a certain distance using a stopwatch. Fastest time wins! Graphing of the events is also an excellent idea. Students can sharp shoot an object (bean bag or squishy ball) and measure the distance. Longest distance thrower wins. Certificates can be made for the gold, silver and bronze winners.

Mass of Gum

What student does not like to chew gum? What happens to the mass of gum after it has been chewed for 10 minutes? Will the mass increase? Decrease? Or stay the same? Materials for this activity are balance, metric masses, pack of gum (3 different types), calculator, and stop watch. Students will weigh the mass of gum prior to chewing it and then after chewing it for 10 minutes.

Book Resources



Allen, Katy Z., *Energy*, Scienceworks for Kids Series, Evan Moor Corp., Monterrey, CA, copyright 2002

Bark, Jaspre, *Journal of Inventions – Leonardo da Vinci*, Silver Dolphin Books, San Diego, California, copyright 2008.

Jennett, Pamela, *Power Practice – Physical Science,* Creative Teaching Press, Inc., Huntington Beach, CA, copyright 2004.

Krupp, E. L., *The Rainbow and You*, Illustrated by Robin Hector Krupp, Harper Collins Publishers, Printed in Singapore, copyright 2000.

Scholastic, Inc. , *One Day in the Life of Bubble Gum*, written and illustrated by fourth grade students of Mt. Horeb Intermediate center, in Mr. Horeb, Wisconsin, copyright 2001.

Dr. Seuss, *Bartholomew and the Oobleck*, Random House Inc., New York, copyright 1946, renewed 1976.

Internet Resources

www.brainpop.com

www.chem4kids.com

www.classzone.com

www.middleschoolscience.com

www.physicsclassroom.com

www.pppst.com

www.rubistar.4teachers.org

www.salem.k12.va.us/staff/dwells/Ch14.ppt

www.sciencespot.net

www.sfrc.ufl.edu/plt/activities_files/EandS_Jeopardy_PP1.ppt

www.studyjams.com

www.teachersdomain.org

MIAMI-DADE COUNTY PULIC SCHOOLS
DISTRICT PACING GUIDE

YEAR-AT-A-GLANCE

M/J COMPREHENSIVE SCIENCE 1 — **COURSE CODE: 200204001**

1ST Nine Weeks

I. Natural Disasters and their Effects on Floridians (SC.6.E.7.7, SC.6.E.7.8, SC.6.N.1.2, SC.6.N.1.5, SC.6.N.2.1, SC.6.N.2.2, SC.6.N.3.4, LACC.68.RST.3.7; LACC.68.WHST.1.2)
- A. Hurricanes
- B. Other Natural Disasters
- C. Models
- D. Emergency Preparedness
- E. Effects of sun Exposure

II. Thermal Energy Transfer (SC.6.E.7.1, SC.6.E.7.2, SC.6.N.1.1, SC.6.N.1.4; SC.6.N.3.4, MACC.6.SP.2, MACC.6.SP.2.5 a and b)
- A. Heat Transfer in Earth's Systems
- B. Temperature vs. Thermal Energy
- C. Water Cycle

III. Climate and Global Patterns (SC.6.E.7.3, SC.6.E.7.5, SC.6.E.7.6, SC.6.N.1.1, MACC.SP.1.3)
- A. Global Patterns that Affect Weather
- B. Influences on Local Weather

IV. Causes of Weather (SC.6.E.7.3, SC.6.E.7.6, SC.6.N.1.1, LACC.68.RST.3.7)
- A. Weather
- B. Air Mass/Fronts
- C. Atmospheric Conditions
- D. Predicting the Weather

V. Atmosphere and Spheres of the Earth (SC.6.E.7.3, SC.6.E.7.4, SC.6.E.7.5, SC.6.E.7.6, SC.6.E.7.9, SC.6.N.3.1, SC.6.N.3.4)
- A. Earth's Spheres
- B. Composition, Structure, and Function of the Atmosphere
- C. Weather vs. Climate
- D. Human Activities and Climate Change
- E. Quarterly Assessment

2nd Nine Weeks

VI. How Weathering and Erosion Affect the Earth (SC.6.E.6.1, SC.6.N.1.1, LA.CC.68.WHST.1.2, MACC.6.EE.3.9)
- A. Weathering
- B. Erosion
- C. Deposition

VII. Landforms of the Geosphere (SC.6.E.6.2, SC.6.N.1.1, SC.6.N.1.4, SC.6.N.2.2, SC.6.N.3.4, LACC.68.RST.3.7)
- A. Types and Formation
- B. Florida Landforms

VIII. Potential and Kinetic Energy (SC.6.P.11.1, SC.6.N.1.1, LACC.68.RST.1.3, LACC.68.WHST.1.2, LACC.68.WHST.3.9)
- A. Potential Energy
- B. Kinetic Energy
- C. Forms of Energy

IX. Energy Transfers and the Law of Conservation of Energy (SC.6.P.11.1, SC.6.N.2.2, SC.6.N.3.2, LACC.68.RST.1.3, LACC.68.RST.2.4)
- A. Law of Conservation of Energy
- B. Energy Transformations
- C. Scientific Investigations
- D. Quarterly Assessment

3rd Nine Weeks

X. Motion of Objects (SC.6.P.12.1, SC.6.N.1.1, MACC.6.EE.3.9)
- A. Measuring Speed and Distance
- B. Constructing and Analyzing Line Graphs

XI. Types of Forces (SC.6.P.13.1, SC.6.N.1.1, LACC.68.RST.4.10, LACC.68.WHST.1.2, MACC.6.SP.2.5)
- A. Contact Forces
- B. Forces Acting at a Distance

XII. Law of Universal Gravitation (SC.6.P.13.2, SC.6.N.1.3, SC.6.N.1.5, SC.6.N.2.1, SC.6.N.3.2, SC.6.N.3.3, MACC.6.SP.2.5d)
- A. Gravitational Force
- B. Mass vs. Weight
- C. Newton's Law of Universal Gravitation

XIII. Forces and Motion (SC.6.P.13.3, SC.6.N.1.3, MACC.6.SP.2.5a, b, c and d)
- A. Forces
- B. The Effects of an Unbalanced Force on an Object

XIV. Levels of Organization (SC.6.L.14.1, SC.6.L.15.1, SC.6.N.1.3, SC.6.N.2.2, LACC.68.RST.3.7)
- A. Hierarchical Organization of Organisms
- B. Linnaean Classification System
- C. Scientific Name
- D. History of Classification
- E. Quarterly Assessment

4th Nine Weeks

XV. Cell Theory (SC.6.L.14.2, SC.6.N.2.3, LACC.68.RST.4.10, LACC68.WHST.1.2, LACC.68.WHST.3.9)
- A. Cell Theory

XVI. Cell Structure and Organelles (SC.6.L.14.4, SC.6.N.3.4, LACC.68.RST.2.4, LACC.68.RST.3.7, LACC.68.WHST.3.9)
- A. Prokaryotic and Eukaryotic Cells
- B. Structure of Cells
- C. Plant and Animal Cell Comparison

XVII. Homeostasis (SC.6.L.14.3, LA.CC.68.RST.2.4, LACC.RST.3.7)
- A. Energy Extraction from Food
- B. Removal of Waste By Cells
- C. Cell Reproduction Overview

XVIII. Human Body Systems (SC.6.L.14.5, HE.6.C.1.7, HE.6.C.1.8, LACC.68.RST.4.10, LACC.68.WHST.1.2, LACC.68.WHST.3.9)
- A. Major Body Systems
- B. Interactions of Body Systems to Maintain Homeostasis
- C. Effects of Drugs on Body Systems

XIX. Pathogens Comparison (SC.6.L.14.6, HE.6.C.1.3, HC.6.C.1.5, HE.6.C.1.8, LAcc.68.rst.4.10)
- A. Viruses
- B. Bacteria
- C. Fungi and Parasites
- D. Disease Prevention
- E. Sexually Transmitted Infections (STI)
- F. HIV/AIDS

XX. Substance Abuse, Health, and Decision Making (HE.6.P.1.1, HE.6.P.1.2, HE.6.B.2.2; HE.6.B.3.1, HE.6.B.3.4)
- A. Social and Emotional Growth
- B. Child Abuse and Sexual Abuse
- C. Risk Reduction
- D. Peer Pressure
- E. Tobacco Use
- F. Refusal Skills

XXI. Human Growth and Development (HE.6.C.1.7, HE.6.C.1.8, HE.6.P.1.3, HE.6.C.1.3)
- A. The Body
- B. Social and Emotional Growth
- C. Child Abuse and Sexual Abuse
- D. Quarterly Assessment

MIAMI-DADE COUNTY PULIC SCHOOLS
DISTRICT PACING GUIDE

YEAR-AT-A-GLANCE

M/J COMPREHENSIVE SCIENCE 1, Advanced — **COURSE CODE: 200205001**

1ST Nine Weeks

I. Natural Disasters and their Effects on Floridians (SC.6.E.7.7, SC.6.E.7.8, SC.912.E.7.5, SC.912.E.7.6, SC.6.N.1.2, SC.6.N.1.5, SC.6.N.2.1, SC.6.N.2.2, SC.6.N.3.4, LACC.68.RST.3.7, LACC.68.WHST.1.2)
- A. Hurricanes
- B. Other Natural Disasters
- C. Models
- D. Emergency Preparedness
- E. Effects of Sun Exposure

II. Thermal Energy Transfer (SC.6.E.7.1, SC.6.E.7.2, SC.912.P.10.4, SC.6.N.1.1, SC.6.N.1.4; MACC.6.SP.2.5c and d)
- A. Heat Transfer in Earth's Systems
- B. Temperature vs. Thermal Energy
- C. Water Cycle

III. Global Patterns Influences on Weather (SC.6.E.7.3, SC.6.E.7.5, SC.6.E.7.6, SC.912.E.7.6, SC.8.E.5.9, SC.6.N.1.1, macc.6.sp.1.3)
- A. Global patterns that Affect Weather
- B. Influences on Local Weather
- C. Seasons

IV. Weather Patterns (SC.6.E.7.2, SC.6.E.7.3, SC.6.E.7.6, SC.912.E.7.6, SC.8.E.5.9, SC.6.N.1.1, LACC.68.RST.3.7)
- A. Weather
- B. Air Mass/Fronts
- C. Atmospheric Conditions
- D. Predicting the Weather
- E. Tides

V. Atmosphere and Spheres of the Earth (SC.6.E.7.1, SC.6.E.7.3, SC.6.E.7.4, SC.6.E.7.5, SC.6.E.7.6, SC.6.E.7.9, SC.912.P.10.4, SC.8.E.5.7, SC.6.N.3.4)
- A. Earth's Spheres
- B. Composition, Structure, and Function of the Atmosphere
- C. Weather vs. Climate
- D. Human Activities and Climate Change
- E. Atmospheric Conditions of Planets
- F. Quarterly Assessment

2nd Nine Weeks

VI. How Weathering and Erosion Affect the Earth (SC.6.E.6.1, SC.6.N.1.1, SC.912.E.7.3, LACC.68.WHST.1.2 MACC.6.EE.3.9)
- A. Weathering
- B. Erosion
- C. Deposition

VII. Landforms of the Geosphere (SC.6.E.6.2, SC.912.E.7.6, SC.6.N.1.1, SC.6.N.1.4, SC.6.N.2.2, SC.6.N.3.4, LA.CC.68.RST.3.7)
- A. Types and Formation
- B. Florida Landforms

VIII. Potential and Kinetic Energy (SC.6.P.11.1, SC.912.P.10.4, SC.6.N.1.1, LACC.68.RST.1.3, LACC68.WHST.1.2, LACC.68.WHST.3.9)
- A. Potential Energy
- B. Kinetic Energy
- C. Forms of Energy
- D. Transfer of Heat

IX. Energy Transfers and the Law of Conservation of Energy (SC.6.P.11.1, SC.912.P.10.4, SC.6.N.2.2, SC.6.N.2.3, SC.6.N.3.2, SC.6.N.3.3, LACC.68.RST.1.3, LACC.68.RST.2.4)
- A. Law of Conservation of Energy
- B. Energy Transformations
- C. Scientific Investigations
- D. Quarterly Assessment

3rd Nine Weeks

X. Motion of Objects (SC.6.P.12.1, SC.6.N.1.1, SC.8.E.5.3, SC.8.E.5.1, MACC.6.EE.3.9)
- A. Measuring Speed and Distance
- B. Constructing and Analyzing Line Graphs
- C. Distances in Space

XI. Types of Forces (SC.6.P.13.1, SC.6.N.1.1, LACC.68.WHST.1.2, MACC.6.SP.2.5a)
- A. Contact Forces
- B. Forces Acting at a Distance

XII. Law of Universal Gravitation (SC.6.P.13.2, SC.8.E.5.4, SC.8.E.5.7. SC.8.E.5.8, SC.8.E.5.9. SC.6.N.1.3, SC.6.N.1.5, SC.6.N.2.1, MACC.6.SP.2.5d)
- A. Gravitational Force
- B. Mass vs. Weight
- C. Newton's Law of Universal Gravitation
- D. Roles of Gravity
- E. Models of Solar Systems
- F. Tides

XIII. Forces and Motion (SC.6.P.13.3, SC.6.N.1.3, MACC.6.SP.1.3, MACC.6.SP.2.5a, b, c and d)
- A. The Effects of an Unbalanced Force on an Object
- B. Forces

XIV. Levels of Organization (SC.6.L.14.1, SC.6.L.15.1, SC.6.N.1.3, SC.6.N.2.2, LACC.68.RST.3.7)
- A. Hierarchical Organization of Organisms
- B. Linnaean Classification System
- C. Quarterly Assessment

4th Nine Weeks

XV. Cell Theory (SC.6.L.14.2, SC.6.N.2.3, LACC.68.RST.4.10, LACC.68.WHST.1.2, LACC.68.WHST.3.9,)
- A. Cell Theory

XVI. Cell Structure and Organelles (SC.6.L.14.4, SC.912.L.14.3, SC.6.N.3.4, LACC.68.RST.2.4, LACC.68.RST.3.7, LACC.68.WHST.3.9)
- A. Prokaryotic and Eukaryotic Cells
- B. Structure of Cells
- C. Plant and Animal Cell Comparison

XVII. Homeostasis (SC.6.L.14.3, SC.912.L.16.14, , LACC.68.RST.2.4, LACC.68.RST.3.7)
- A. Energy Extraction from Food
- B. Removal of Waste
- C. Cell Reproduction Overview

XVIII. Human Body Systems (SC.6.L.14.5, HE.6.C.1.7, HE.6.C.1.8, LACC.68.RST.4.10, LACC.68.WHST.1.2, LACC.68.WHST.3.9)
- A. Major Body Systems
- B. Interactions of Body Systems to Maintain Homeostasis
- C. Effects of Drugs on Body Systems

XIX. Pathogens Comparison (SC.6.L.14.6, HE.6.C.1.3, HC.6.C.1.5, HE.6.C.1.8, LACC.68.RST.4.10)
- A. Viruses
- B. Bacteria
- C. Fungi and Parasites
- D. Disease Prevention
- E. Sexually Transmitted Infections (STI)
- F. HIV/AIDS

XX. Substance Abuse, Health, and Decision Making (HE.6.P.1.1, HE.6.P.1.2, HE.6.B.2.2; HE.6.B.3.1, HE.6.B.3.4)
- A. Social and Emotional Growth
- B. Child Abuse and Sexual Abuse
- C. Risk Reduction
- D. Peer Pressure
- E. Tobacco Use
- F. Refusal Skills

XXI. *Human Growth and Development (HE.6.C.1.7, HE.6.C.1.8, HE.6.P.1.3, H.E.6.1.3)*
- A. The Body
- B. Social and Emotional Growth
- C. Child Abuse and Sexual Abuse
- D. Quarterly Assessment

MIAMI-DADE COUNTY PUBLIC SCHOOLS
DISTRICT PACING GUIDE

YEAR-AT-A-GLANCE

M/J COMPREHENSIVE SCIENCE 2 — **COURSE CODE: 200207001**

1ST Nine Weeks

I. Practice of Science and Heat Energy (SC.7.P.11.1; SC.7.P.11.4; SC.7.N.1.1; SC.7.N.1.2; SC.7.N.1.3; SC.7.N.1.4)
- A. Heat and Temperature
- B. Properties of Matter
- C. States of Matter
- D. Changes in Matter
- E. Practice of Science
- F. Pretest

II. Conservation of Energy and Energy Transformations (SC.7.P.11.2; SC.7.P.11.3; LACC.68.RST.4.10)
- A. Energy
- B. Potential Energy and Kinetic Energy Review
- C. Law of Conservation of Energy

III. Properties of Waves (SC.7.P.10.1; SC.7.N.1.3; SC.7.N.1.4; MACC.6.SP.2.5a, b and c, LACC.68.RST.1.3)
- A. Electromagnetic vs. Mechanical
- B. The Sun's Energy as Radiation: Electromagnetic Spectrum
- C. Scientific Investigations

IV. Properties of Light (SC.7.P.10.2; SC.7.P.10.3; SC.7.N.1.3; SC.7.N.1.4; LACC.68.RST.2.4, MACC.6.SP.2.5d)
- A. Light Properties
- B. Materials and Light
- C. Wave Speed in Different Materials
- D. Quarterly Assessment

2nd Nine Weeks

V. Layers of Earth (SC.7.E.6.1; SC.7.E.6.5; SC.7.N.3.2, MACC.6.SP.2.5b)
- A. Crust
- B. Mantle
- C. Core
- D. Structural Zones

VI. Changes in Earths Surfaces (SC.7.E.6.2; SC.7.E.6.5; SC.7.N.3.2, LACC.68.WHST.1.2)
- A. Rock Cycle
- B. Scientific Theory of Plate Tectonics
- C. Tectonic Plate Movement
- D. Surface Features

VII. Rock Cycle and Processes That Shape the Earth's Surface (SC.7.E.6.2; SC.7.E.6.6; SC.7.E.6.5; SC.7.E.6.7; LACC.68.RST.3.7)
- A. Rocks and the Rock Cycle
- B. Types of Rocks
- C. Processes That Change Earth's Surface
- D. Landforms on Earth
- E. Landforms in Florida
- F. How Humans Impact the Earth

VIII. Age of Earth/ Geological Time (SC.7.E.6.4; SC.7.E.6.3, LACC.6.8.WHST.1.2, LACC.68.WHST.3.9)
- A. Law of Superposition
- B. Absolute Age
- C. Geologic Time
- D. Quarterly Assessment

3rd Nine Weeks

IX. Fossils (SC.7.L.15.1; SC.7.N.1.2, LACC.68.RST.1.3)
- A. Formation of Fossils
- B. Index Fossils
- C. Evidence of Species Change
- D. Evidence of the Scientific Theory of Evolution

X. Evidence of Species Change (SC.7.L.15.1; SC.7.L.15.2; SC.7.L.15.3; SC.7.N.3.1)
- A. Evidence of Scientific Theory of Evolution
- B. Adaptations/Natural Selection
- C. Extinction

XI. Environmental Factors and Evolution (SC.7.L.15.2; SC.7.L.15.3; SC.7.L.17.3; SC.7.E.6.6)
- A. Scientific Theory of Evolution
- B. Natural Selection
- C. Limiting Factors
- D. Limiting Factors Affecting the Everglades
- E. Human Activities and the Everglades

XII. Relationships in Ecosystems (SC.7.L.17.2; SC.7.L.17.1; SC.7.L.17.3)
- A. Relationships
- B. Food Web
- C. Energy Flow in Ecosystems
- D. Revisit Limiting Factors (see Topic XI)

XIII. Human Impact on Earth (SC.7.E.6.6; SC.7.N.1.2; MACC.6.SP.2.5c and d)
- A. Resources
- B. Biodiversity
- C. Land
- D. Air
- E. Water
- F. Quarterly Assessment

4th Nine Weeks

XIV. Meiosis and Mitosis (SC.7.L.16.3, LACC.68.RST.3.7, LACC.68.RST.4.10, HE.7.C.1.4)
- A. Asexual-Mitosis
- B. Sexual-Meiosis
- C. Effects on Natural Selection

XV. Genetic Traits and Heredity (SC.7.L.16.1)
- A. Review Cell Structure
- B. DNA /RNA
- C. Replication
- D. Chromosomes

XVI. Genetic Traits and Heredity (SC.7.L.16.2), LACC.68.RST.2.4
- A. Mendelian Genetics
- B. Genotype/Phenotype
- C. Punnett Squares and Pedigrees

XVII. Biotechnology (SC.7.L.16.4; SC.7.N.1.5; SC.7.N.1.7)
- A. Cloning
- B. Genetic Engineering
- C. Artificial Selection
- D. Impact on Society

XVIII. Health and Disease Prevention (HE.7.C.1.1; HE.C.1.2; HE.C.1.8; HE.7.B.3.1; HE.7.B.3.6)
- A. Reproductive Health
- B. Stress Management
- C. Heredity
- D. Communicable Disease and Infection
- E. Healthy Decisions
- F. Healthy Goals

XIX. Human Growth and Development (HE.7.C.1.7; HE.C.1.8; HE.P.1.2; HE.7.P.1.3; HE.7.B.3.6)
- A. Body Systems
- B. Mental
- C. Dating
- D. HIV/AIDS
- E. Abstinence
- F. Quarterly Assessment

MIAMI-DADE COUNTY PUBLIC SCHOOLS
DISTRICT PACING GUIDE

YEAR-AT-A-GLANCE

M/J COMPREHENSIVE SCIENCE 2 ADVANCED — **COURSE CODE: 200208001**

1ST Nine Weeks

I. Practice of Science and Heat Energy (SC.7.P.11.1; SC.7.P.11.4; SC.7.N.1.1; SC.7.N.1.2; SC.7.N.1.3; SC.7.N.1.4)
- A. Heat and Temperature
- B. Properties of Matter
- C. States of Matter
- D. Changes in Matter
- E. Practice of Science
- F. Pretest

II. Conservation of Energy and Energy Transformations (SC.7.P.11.2; SC.7.P.11.3; SC.912.P.10.1; SC.8.L.18.1; SC.8.L.18.2; SC.8.L.18.3; SC.8.L.18.4, LACC.68.RST.4.10)
- A. Energy
- B. Potential Energy and Kinetic Energy Review
- C. Law of Conservation of Energy
- D. Matter and Energy Transformation
- E. Conservation of Mass and Energy

III. Properties of Waves (SC.7.P.10.1; SC.7.N.1.3; SC.7.N.1.4; MACC.6.SP.2.5a, b, and c, LACC.68.RST.1.3)
- A. Electromagnetic vs. Mechanical
- B. The Sun's Energy as Radiation: Electromagnetic Spectrum
- C. Planetary Images and Satellite Photographs
- D. Scientific Investigations

IV. Properties of Light (SC.7.P.10.2; SC.7.P.10.3; SC.7.N.1.3; SC.7.N.1.4; LACC.68.RST.2.4, MACC.6.SP.2.5d)
- A. Light Properties
- B. Materials and Light
- C. Wave Speed in Different Materials

2nd Nine Weeks

V. Layers of Earth (SC.7.E.6.1; SC.7.E.6.5; SC.7.N.3.2; SC.912.E.6.1; SC.8.E.5.7, SC.7.N.3.2;, MACC.6.SP.2.5b)
- A. Crust
- B. Mantle
- C. Core
- D. Structural Zones

VI. Changes in Earth's Surface (SC.7.E.6.2; SC.7.E.6.5; SC.912.E.6.2; SC.912.E.6.3; SC.8.N.3.2 , SC.7.N.3.2;SC.7.N.2.1, LACC.68.WHST.1.2)
- A. Rock Cycle
- B. Scientific Theory of Plate Tectonics
- C. Tectonic Plate Movement
- D. Surface Features

VII. Rock Cycle and Processes That Shape the Earth's Surface (SC.7.E.6.2; SC.7.E.6.6; SC.7.E.6.5; SC.7.E.6.7; LACC.68.RST.3.7)
- A. Rocks and the Rock Cycle
- B. Types of Rocks
- C. Processes That Change Earth's Surface
- D. Landforms on Earth
- E. Landforms in Florida
- F. How Humans Impact the Earth

VIII. Age of Earth/ Geological Time (SC.7.E.6.4; SC.7.E.6.3, LACC.68.WHST.1.2, LACC.68.WHST.3.9)
- A. Law of Superposition
- B. Absolute Age
- C. Geologic Time
- D. Quarterly Assessment

3rd Nine Weeks

IX. Fossils (SC.7.L.15.1; SC.7.N.1.2; LACC.68.RST.1.3)
- A. Formation of Fossils
- B. Index Fossils
- C. Evidence of Species Change
- D. Evidence of the Scientific Theory of Evolution

X. Evidence of Species Change (SC.7.L.15.1; SC.7.L.15.2; SC.7.L.15.3; SC.7.N.3.1)
- A. Evidence of Scientific Theory of Evolution
- B. Adaptations/Natural Selection
- C. Extinction

XI. Environmental Factors and Evolution (SC.7.L.15.2; SC.7.L.15.3; SC.7.L.17.3; SC.7.E.6.6)
- A. Scientific Theory of Evolution
- B. Natural Selection
- C. Limiting Factors
- D. Limiting Factors Affecting the Everglades
- E. Human Activities and the Everglades

XII. Relationships in Ecosystems (SC.7.L.17.2; SC.7.L.17.1; SC.7.L.17.3; SC.912.L.15.6; SC.9.12.L.17.6; SC.912.L.17.9)
- A. Relationships
- B. Food Web
- C. Energy Flow in Ecosystems
- D. Revisit Limiting Factors (see Topic XI)

XIII. Human Impact on Earth ((SC.7.E.6.6; SC.7.N.1.2; MACC.6.SP.2.5c and d)
- A. Resources
- B. Biodiversity
- C. Land
- D. Air
- E. Water
- F. Quarterly Assessment

4th Nine Weeks

XIV. Meiosis and Mitosis (SC.7.L.16.3; LACC.68.RST.3.7, LACC.68.RST.4.10, HE.7.C.1.4)
- A. Asexual-Mitosis
- B. Sexual-Meiosis
- C. Effects on Natural Selection

XV. DNA, Chromosomes and Heredity (SC.7.L.16.1)
- A. Review Cell Structure
- B. DNA /RNA
- C. Replication
- D. Chromosomes

XVI. Genetic Traits and Heredity (SC.7.L.16.2; Sc.912.l.16.2, LACC.68.RST.2.4)
- A. Mendelian Genetics
- B. Genotype/Phenotype
- C. Punnett Squares and Pedigrees

XVII. Biotechnology (SC.7.L.16.4; SC.7.N.1.5; SC.7.N.1.7)
- A. Cloning
- B. Genetic Engineering
- C. Artificial Selection
- D. Impact on Society

XVIII. Health and Disease Prevention (HE.7.C.1.1; HE.C.1.2; HE.C.1.8; HE.7.B.3.1; HE.7.B.3.6)
- A. Reproductive Health
- B. Stress Management
- C. Heredity
- D. Communicable Disease and Infection
- E. Healthy Decisions
- F. Healthy Goals

XIX. Human Growth and Development (HE.7.C.1.7; HE.C.1.8; HE.P.1.2; HE.7.P.1.3; HE.7.B.3.6)
- A. Body Systems
- B. Mental
- C. Dating
- D. HIV/AIDS
- E. Abstinence
- F. Quarterly Assessment

MIAMI-DADE COUNTY PUBLIC SCHOOLS
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YEAR-AT-A-GLANCE

M/J COMPREHENSIVE SCIENCE 3 — **COURSE CODE: 200210001**

1ST Nine Weeks	2nd Nine Weeks	3rd Nine Weeks	4th Nine Weeks
I. Matter (SC.8.P.8.2, SC.8.P.8.3, SC.8.N.1.1; SC.8.N.1.2: SC.8.N.1.4, SC.8.N.1.6) A. What is Matter? B. Review Forces C. Weight vs. Mass D. Density E. Scientific Measurement F. Designing an Experiment G. Baseline Testing II. Physical Properties of Matter (SC.8.P.8.4; SC.8.P.9.2; SC.8.P.9.3, SC.8.N.1.1; SC.8.N.1.2, SC.8.N.1.6) A. Physical Properties B. Chemical Properties C. Physical and Chemical Changes III. Matter – Phase Change (SC.8.P.8.4; SC.8.P.8.1; SC.8.N.1.1; SC.8.N.1.2) A. States of Matter B. Changes of State C. Law of Conservation of Mass D. How Scientists Work IV. Atoms (SC.8.P.8.7; SC.8.P.8.1; SC.8.N.1.4; ;SC.8.N.3.2; LACC.68.WHST.1.2; LACC.68.WHST.3.9) A. Scientific Models and Systems B. Scientific Theories C. Describing Matter D. Atoms V. Atoms and the Periodic Table (SC.8.P.8.6 SC.8.P.8.7; SC.8.N.1.1; SC.8.N.1.4; SC.8.N.1.6; SC.8.N.3.2) 1. Periodic Table 2. Atomic Models 3. Interim Assessment	VI. Chemical Properties and Changes of Matter (SC.8.P.8.5; SC.8.P.8.6; SC.8.P.8.8; SC.8.P.9.1; SC.8.P9.2; SC.8.P.9.3; SC.8.N.2.2; LACC.68.RST.1.3) A. Compounds B. Chemical Changes VII. Mixtures and Solutions (SC.8.P.8.4; SC.8.P.8.9; SC.8.N.1.1; SC.8.N.1.6; LACC.68.RST.4.10; LACC.68.WHST.1.2) A. Pure Substances and Mixtures B. Solutions C. What Factors Affect Solubility? VIII. Photosynthesis and Cellular Respiration (SC.8.L.18.1; SC.L.18.2; SC.L.18.4; SC.8.N.1.1; SC.8. P.8.5) A. Cell Structure Overview B. Photosynthesis (reactants) C. Photosynthesis (products) D. Law of Conservation of Mass and Energy E. Review Electromagnetic Spectrum F. Cell Respiration G. Process and Pathways IX. Cycles of Matter (SC.8.L.18.3; SC.8.L.18.4; SC.8.N.1.1; SC.8.P.8.5; LACC.68.RST.3.7) A. Cycles in Nature B. Recycling Carbon, Oxygen and Nitrogen C. Conservation of Matter and Energy X. Stars and Galaxies (SC.8.E.5.2; SC.8.E.5.1; SC.8.E.5.5; SC.8.E.5.3; SC.8.E.5.4; SC.8.E.5.11; SC.8.E.5.10; LACC.68.RST.2.44) A. Objects in Space B. Distances in Space C. Properties of Stars D. Astronomical Bodies E. Law of Universal Gravitation and the Formation of Stars F. Interim Test	XI. The Sun (SC.8.E.5.4; SC.8.E.5.5; SC.8.E.5.6; LACC.68.RST.3; MACC8F.2.5) A. Scientific Knowledge B. The Sun's Characteristics C. Energy from the Sun XII. Solar System (SC.8.E.5.8; SC.8.E.5.7; SC.8.E.5.3; SC.8.E.5.4; SC.8.N.1.3; SC.8.N.3.2) A. Introduction to the Solar System B. Earth's Moon C. Planets D. Other Objects (Asteroids, Comets, Meteor, Meteorite) E. Models of the Solar System XIII. Models of the Solar System Solar System: Sun, Earth, and Moon (SC.8.E.5.9; SC.8.E.5.10; SC.8.E.5.11; SC.8.N.1.6); LACC.68.RST.3.7; LACC.68.RST.4.10 A. The Impact of Gravity on Earth B. Earth in Space C. Seasons D. Phases and Eclipses E. Tides F. Benchmark Assessment	XIV. Review Annually Assessed Benchmarks (Fair Game SC.7.E.6.2 ; SC.6.E.6.1; SC.6.E.6.2; SC.7.E.6.6; SC.7.E.6.4; SC.7.E.6.3; SC.7.E.6.5; SC.7.E.6.1; SC.7.E.6.7; SC.6.E.7.4; SC.6.E.7.2; SC.6.E.7.3; SC.6.E.7.6; SC.6.E.7.9; SC.6.E.7.5; SC.6.E.7.1; SC.7.P.10.3; SC.7.P.10.2; SC.7.P.11.2; SC.6.P.11.1 SC.7.P.11.3; SC.7.P.11.4; SC.7.P.11.1; SC.6.P.13.1; SC.6.P.13.2; SC.8.P.8.2; SC.6.L.14.1; SC.6.L.14.2; SC.6.L.14.3; SC.6.L.14.4; SC.6.L.14.5; SC.6.L.14.6; SC.6.L.15.1; SC.7.L.15.2; SC.7.L.15.1; SC.7.L.15.3; SC.7.L.16.1; SC.7.L.16.2; SC.7.L.16.3, SC.7.L.17.2) XV. Human Regulation and Reproduction (HE.8.C.1.7; HE.8.C.1.8; HE.8.C.2.7; HE.8.C.2.8; HE.8.C.2.9; HE.B.3.1; HE.B.3.6; HE.B.3.7; HE.8.P.1.1; HE.8.P.1.2; HE.8P.1.3) A. Endocrine System B. Reproductive System C. Human Life Stages D. Planning for Marriage and Parenthood E. Abstinence F. Sexually Transmitted Disease G. HIV/AIDS XVI. Substance Abuse - Personal Health Relationships (HE.8.P.1.1; HE.8.B.3.4; HE.8.B.3.7; HE.8.B.2.1; HE.8.C.2.2; HE.8.C.2.7; HE.8.C.1.1; HE.8.C.1.5) A. Family and Peers B. Substance Abuse Prevention C. Peer Pressure D. Communication E. Personal Health

MIAMI-DADE COUNTY PUBLIC SCHOOLS
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YEAR-AT-A-GLANCE

M/J COMPREHENSIVE SCIENCE 3, ADVANCED — **Course Code: 200211001**

1ST Nine Weeks

I. Matter (SC.8.P.8.2, SC.8.P.8.3 ; SC912.P.8.2; SC.8.N.1.1; SC.8.N.1.2: SC.8.N.1.4; SC.8.N.1.5; SC.8.N.1.6)
- A. What is Matter?
- B. Review Forces
- C. Weight vs. Mass
- D. Density
- E. Scientific Measurement
- F. Designing an Experiment
- G. Baseline Testing

II. Properties and Changes of Matter (SC.8.P.8.4; SC.912.P.8.2; SC.912.P.8.1; SC.8.P.9.2; SC.8.P.9.3; SC.8.N.1.1; SC.8.N.1.2; SC.8.N.1.6)
- A. Physical properties
- B. Chemical properties
- C. Physical and Chemical Changes

III. Matter – Phase Change (SC.8.P.8.4; SC.8.P.8.1; SC.8.N.1.1; SC.8.N.1.2)
- A. States of Matter
- B. Changes of State
- C. Law of Conservation of Mass
- D. How Scientists Work

IV. Atoms (SC.8.P.8.7; SC.8.P.8.1; SC.912.P.8.5; SC.912.P.8.7; SC.8.N.1.4; SC.8.N.3.2; LACC.68.WHST.1.2; LACC68.WHST.3.9)
- A. Scientific Models and Systems
- B. Scientific Theories
- C. Describing Matter
- D. Atoms

V. Atoms and the Periodic Table (SC.8.P.8.6 SC.8.P.8.7; SC.912.P.8.5; SC.8.N.1.1; SC.8.N.1.4; SC.8.N.1.6; SC.8.N.3.2)
- 1. Periodic Table
- 2. Interim Test
- 3. Interim Assessment

2nd Nine Weeks

VI. Chemical Properties and Changes of Matter (SC.8.P.8.5; SC.8.P.8.6; SC.8.P.8.8; SC.912.P.8.11; SC.8.P.9.1; SC.8.P9.2; SC.8.P.9.3; SC.8.N.2.2; SC.8.N.3.1; LACC.68.RST.1.3)
- A. Compounds
- B. Chemical Changes

VII. Mixtures and Solutions (SC.8.P.8.4; SC.8.P.8.9; SC.8.N.1.1; SC.8.N.1.6; LACC.68.WHST.1.2)
- A. Pure Substances and Mixtures
- B. Solutions
- C. What Factors Affect Solubility?

VIII. Photosynthesis and Cellular Respiration (SC.8.L.18.1; SC.L.18.2; SC.L.18.4; SC.912.L.18.7; SC.912.L.18.8; SC.912.L.18.9; SC.8.N.1.1; SC.8. P.8.5)
- A. Cell Structure Overview
- B. Photosynthesis (reactants)
- C. Photosynthesis (products)
- D. Law of Conservation of Mass and Energy
- E. Review Electromagnetic Spectrum
- F. Cell Respiration
- G. Process and Pathways

IX. Cycles of Matter (SC.8.L.18.3; SC.8.L.18.4; SC.8.N.1.1; SC.8.P.8.5; LACC.68.RST.3.7)
- A. Cycles in Nature
- B. Recycling Carbon, Oxygen and Nitrogen
- C. Conservation of Matter and Energy

X. Stars and Galaxies (SC.8.E.5.2; SC.8.E.5.1; SC.8.E.5.5; SC.8.E.5.3; SC.8.E.5.4; SC.8.E.5.11; SC.8.E.5.10; LACC.68.RST.2.4)
- A. Objects in Space
- B. Distances in Space
- C. Properties of Stars
- D. Astronomical Bodies
- E. Law of Universal Gravitation and the Formation of Stars
- F. Interim Test

3rd Nine Weeks

XI. The Sun (SC.8.E.5.4; SC.8.E.5.5; SC.8.E.5.6; SC.912.E.5.4; LACC.68.RST.3.7; MACC.8.F.2.5)
- A. Scientific Knowledge
- B. The Sun's Characteristics
- C. Energy from the Sun

XII. Solar System (SC.8.E.5.8; SC.8.E.5.7; SC.8.E.5.3; SC.8.E.5.4; SC.8.N.1.3; SC.8.N.3.2)
- A. Introduction to the Solar System
- B. Earth's Moon
- C. Planets
- D. Other Objects (Asteroids, Comets, Meteor, Meteorite)
- E. Models of the Solar System

XIII. Models of the Solar System Solar System: Sun, Earth, and Moon (SC.8.E.5.9; SC.8.E.5.10; SC.8.E.5.11; SC.912.E.5.4; SC.8.N.1.6; LACC.68.RST.3.7; LACC.68.RST.4.10)
- A. The Impact of Gravity on Earth
- B. Earth in Space
- C. Seasons
- D. Phases and Eclipses
- E. Tides
- F. Benchmark Assessment

4th Nine Weeks

XIV. Review Annually Assessed Benchmarks (Fair Game SC.7.E.6.2 ; SC.6.E.6.1; SC.6.E.6.2; SC.7.E.6.6; SC.7.E.6.4; SC.7.E.6.3; SC.7.E.6.5; SC.7.E.6.1; SC.7.E.6.7; SC.6.E.7.4; SC.6.E.7.2; SC.6.E.7.3; SC.6.E.7.6; SC.6.E.7.9; SC.6.E.7.5; SC.6.E.7.1; SC.7.P.10.3; SC.7.P.10.2; SC.7.P.11.2; SC.6.P.11.1 SC.7.P.11.3; SC.7.P.11.4; SC.7.P.11.1; SC.6.P.13.1; SC.6.P.13.2; SC.8.P.8.2; SC.6.L.14.1; SC.6.L.14.2; SC.6.L.14.3; SC.6.L.14.4; SC.6.L.14.5; SC.6.L.14.6; SC.6.L.15.1; SC.7.L.15.2; SC.7.L.15.1; SC.7.L.15.3; SC.7.L.16.1; SC.7.L.16.2; SC.7.L.16.3, SC.7.L.17.2)

XV. Human Growth and Development (HE.8.C.1.7; HE.8.C.1.8; HE.C.2.7; HE.C.2.8; HE.C.2.9; HE.8.B.3.1; HE.8.B.3.6; HE.8.B.3.7; HE.8.B.4.1; HE.8.P.1.1; HE.8.P.1.2; HE.8P.1.3)
- A. Endocrine System
- B. Reproductive System
- C. Human Life Stages
- D. Planning for Marriage and Parenthood
- E. Abstinence
- F. Sexually Transmitted Disease
- G. HIV/AIDS

XVI. Substance Abuse - Personal Health Relationships (HE.8.P.1.1; HE.8.B.3.4; HE.8.B.3.7; HE.8.B.2.1; HE.8.C.2.2; HE.8.C.2.7; HE.8.C.1.1; HE.8.C.1.5)
- A. Family and Peers
- B. Substance Abuse Prevention
- C. Peer Pressure
- D. Communication
- E. Personal Health

MIAMI-DADE COUNTY PUBLIC SCHOOLS
DISTRICT PACING GUIDE

YEAR-AT-A-GLANCE

Physical Science Honors – Middle School ONLY | Course Code: 200332001

1ST Nine Weeks	2nd Nine Weeks	3rd Nine Weeks	4th Nine Weeks
I. Introduction *(SC.8.N.1.1; SC.7.N.1.2; SC.6.N.2.2)* A. Lab Safety B. Scientific Method II. Measurement *(SC.8.E.5.1; SC.8.E.5.3; SC.8.E.5.7; SC.8.P.8.4; SC.7.E.6.5)* A. Metric Units B. Measurement C. Algebraic Conversions D. Data analysis and Interpretation III. Motion *(SC.8.E.5.7; SC.8.E.5.4; SC.8.E.5.9; SC.8.P.8.4; SC.6.P.13.3)* A. Speed, Velocity and Acceleration IV. Forces *(SC.8.E.5.4; SC.8.E.5.9; SC.7.N.1.5; SC.6.P.13.1)* A. Forces B. Newton's Laws of Motion C. Law of Universal Gravitation D. Momentum V. Energy *(SC.8.L.18.4;SC.7.N.3.1; SC.7.P.11.2)* A. Forms of Energy B. Energy Transformation C. Law of Conservation of Energy D. Energy Resources	VI. Sound & Light *(SC.8.E.5.5; SC.8.E.5.1; SC.7.N.1.5; SC.7.P.10.1; SC.7.P.10.3)* A. Properties of sound B. Sound Waves C. Properties of light D. Color and Vision E. Optics VII. Nature of Matter *(SC.8.P.8.4; SC.8.L.18.4)* A. Classification of Matter B. Properties of Matter VIII. Gases, Pressure, and the Atmosphere Ch. 13.1 only *(SC.6.E.7.4)* A. Atmosphere and Pressure IX. Thermal Chemistry *(SC.8.E.5.6; SC.7.P.11.4; SC.7.E.6.5; SC.6.E.7.5)* A. Temperature B. Phases of Matter C. Heat and Thermal Energy D. Transfer of Heat X. Atomic Structure *(SC.8.P.8.5; SC.7.N.3.1; SC.7.E.6.4; SC.6.L.14.1; SC.6.N.2.2)* A. Structure of the Atom B. Atomic Models C. Periodic Table	XI. Compounds *(SC.8.P.8.5; SC.6.L.14.1; SC.6.L.16.1)* A. Chemical Bonds and electrons B. Chemical Formulas C. Organic Molecules XII. Chemical Reactions *(SC.8.L.18.4; SC.8.P.9.2; SC.7.N.1.5; SC.7.N.3.1)* A. Chemical Reactions XIII. Solutions *(SC.8.P.8.4; SC.8.P.8.5)* A. Water B. Solutions C. Acids, Bases, and pH XIV. *Work & Machines* (SC.8.E.5.7; SC.7.N.1.5; SC.6.L.14.5; SC.6.E.7.4; SC.6.E.7.5) *A. Work and Power* B. *Simple Machines*	XV. Crunch Time *SC.8.E.5.1 (space travel); SC.8.E.5.3; SC.8.E.5.5; SC.8.E.5.6; SC.8.E.5.7; SC.8.E.5.8; SC.8.E.5.9; SC.8.L.18.4* *SC.7.E.6.2; SC.7.E.6.4; SC.7.E.6.5; SC.7.L.15.2; SC.7.L.16.1; SC.L.17.2;* *SC.6.E.7.4; SC.6.E.7.5;SC.6.P.13.1; SC.6.L.14.1; SC.6.L.14.2; SC.6.L.14.4; SC.6.L.14.5; SC.6.L.15.1* XVI. Energy and Chemical Reactions A. Types of Reactions B. Required Energy C. Reaction Systems D. Reaction Rate E. Nuclear Reactions XVII. Electricity-Static Current A. Electric Circuits B. Electrical Systems XVIII. Magnetism A. Properties and Interactions of Magnets B. Electromagnets C. Electric motors and Generators D. Producing Electric Currents XIX. Behavior of Gases A. Gas Laws

THE EDUCATION FUND

FOR EXCELLENCE IN MIAMI-DADE PUBLIC SCHOOLS

IMPACT II Adapter

Grant Application

M-DCPS teachers, media specialists, counselors or assistant principals may request funds to implement an IMPACT II idea, teaching strategy or project from the Idea EXPO workshops and/or curriculum ideas profiled annually in the *Ideas with IMPACT* catalogs from 1990 to the current year, 2012-13. Most catalogs can be viewed at The Education Fund web site at www.educationfund.org under the heading, Publications.

- Open to all K-12 M-DCPS teachers, counselors, media specialists
- Quick and easy reporting requirements
- Grants range from $150 - $400
- Grant recipients recognized at an Awards Reception

To apply, you must contact the teacher (the Disseminator) who developed the idea. Contact may be made by attending a workshop (such as the Idea EXPO) given by the disseminator or communicating via e-mail or telephone.

Project funds are to be spent within the current school year or an extension may be requested. An expense report with receipts is required by June 15th.

APPLICATION DEADLINE: December 3rd. Apply online at www.educationfund.org.

IMPORTANT: Adapter applications will be awarded in all disciplines, but more Adapter grants will be awarded for STEM projects—Science, Technology, Engineering and Mathematics as there is *additional funding* designated for any k-12 IMPACT science, technology or mathematics project.

General Information

Teacher's Name Employee # E-mail Address

School Name

School Address City Zip Code

Home Address Zip Code

Teacher Cell and/or Home Phone Number_____

I hearby apply for an Adapter Grant: _____
Teacher's Signature Date

I am aware of this application: _____
Principal's Signature Date

Other Team members, if any

Project Information

Project Title: _____

Name of Project Disseminator teacher:_____

You are required to make contact with the disseminator teacher who developed the project.

I made contact via: ___Workshop/Idea EXPO ___Email

___Telephone ___Other (please specifry) _____

Project Implementation

Teaching Assignment (grade level & subject):_____

Number of Students Participating: _____ Level of Achievement: _____

Ethnic Distribution of Project Group: _____% Hispanic _____% Black _____% White ____% other

How will the project help low-performing students (if applicable) in your classroom?_____

_____

_____

What is the educational need for this project in your class?_____

_____

_____

What changes (if any) will be made from the original project idea?_____

_____

_____

Budget Information

What materials or equipment are needed to adapt this project to your class?

Item and Description Cost

_____

_____

_____

Total Funds Requested:_____

Apply online at www.educationfund.org or print and mail the application to:

The Education Fund
900 NE 125th Street
Suite 110
North Miami, FL 33161

Deadline to apply is December 3rd.

For more information contact:
Lorna Pranger Valle
The Education Fund
305-892-5099, ext. 18;
Lvalle@educationfund.org

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www.educationfund.org

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