

**Vision Charter School**

**2011-2012 School year**

1. **Course Number and Title:** General Science (Year 2) 53000
2. **Course Description:** A survey of basic science concepts with an emphasis on the Physical Sciences and land-ocean interactions.
3. **Credit Hours:** 2
4. **Course Prerequisites:** Successful completion of General Science Year 1
5. **Course Dates:** 8/17/11 through 5/25/12
6. **Course Times:** There are 3 sections of this class; you are in one of the following sections.
  - a. **9:55-11:30 B days (located in G1)**
  - b. **12:40-2:15 B days (located in G2)**
7. **Instructor:** Jason George *Email:* [jasongeorge@visioncsd.org](mailto:jasongeorge@visioncsd.org)
8. **Required Text and Other Learning Resources:** Life on Ocean Planet (Current Publishing); Terminal Velocity (Jason Project); Tectonic Fury (Jason Project); Infinite Potential (Jason Project); Activity a day (Jossey-Boss); Brain Powered Science; Physics of Superheroes by; Physics of Nascar.
9. **Course Calendar, Objectives, and Curriculum (Tentative):**

<b>1st quarter topics</b>	<b>Suggested Activities/Lessons</b>	<b>Student Objectives based on National Science</b>	<b>Idaho Content Standards</b>
<b>Introduce Classroom procedures, syllabus, overview of content, &amp; check out books.</b>	<b>*Students will begin reading either Physics of Superheroes or Physics of Nascar and they will trade books at semester.</b>	<i>Students will give a 5-10 minute presentation on something from the reading at the end of each semester.</i>	*8-9.PS.1.8.1 Analyze technical writing, graphs, charts, and diagrams. (658.02a) *8-9.PS.5.2.1 Explain how science advances technology. (655.01a) *8-9.PS.5.2.2 Explain how technology advances science. (655.01a) 8-9.PS.5.2.3 Explain how science and technology are pursued for different purposes. (656.01b)  *These standards will be covered throughout the curriculum
<b>Scientific Investigation</b>	<b>-Brain Powered Science Activity #1</b> <i>"Analogies:</i>	<b><i>Scientific progress is made by asking meaningful questions and conducting careful investigations.</i></b>	*8-9.PS.1.6.1 Identify questions and concepts that guide scientific

*Powerful Teaching and Learning tools.”*

**-Life on Ocean Planet Lab Manual Chapter 1 Activity #1 “It is all about me” Creating Concept Maps.**  
**“Life on Ocean Planet “CD-Rom Scientific Method PowerPoint from (slides 1-26 through 1-29).**

**-Life on Ocean Planet Lab Manual Chapter 1 Activity #3. “How Scientists Solve Problems.**

Graphing Activities?

### **EXAM 1**

**\*Begin Siemens we can change the world challenge.**

**As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:**

- a. Plan and conduct a scientific investigation to test a hypothesis.
- b. Evaluate the accuracy and reproducibility of data.
- c. Distinguish between variable and controlled parameters in a test.
- d. Recognize the slope of the linear graph as the constant in the relationship  $y=kx$  and apply this principle in interpreting graphs constructed from data.
- e. Construct appropriate graphs from data and develop quantitative statements about the relationships between variables.
- f. Apply simple mathematical relationships to determine a missing quantity in a mathematical expression, given the two remaining terms (including speed = distance/time, density = mass/volume, force = pressure  $\times$  area, volume = area  $\times$  height).
- g. Distinguish between linear and nonlinear relationships on a graph of data.

investigations. (649.01a)  
\*8-9.PS.1.6.2 Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations. (649.01b)  
\*8-9.PS.1.6.3 Use appropriate technology and mathematics to make investigations. (649.01c)  
\*8-9.PS.1.6.4 Formulate scientific explanations and models using logic and evidence. (649.01d)  
\*8-9.PS.1.6.5 Analyze alternative explanations and models. (649.01e)  
\*8-9.PS.1.6.6 Communicate and defend a scientific argument. (649.01f)  
\*8-9.PS.1.6.7 Explain the differences among observations, hypotheses, and theories. (649.01g)  
\*8-9.PS.1.2.1 Use observations and data as evidence on which to base scientific explanations. (648.02a)  
\*8-9.PS.1.2.2 Develop models to explain concepts or systems. (648.02b)  
\*8-9.PS.1.2.3 Develop scientific explanations based on knowledge, logic, and analysis. (648.02c)  
\*8-9.PS.1.3.1 Measure changes that can occur in and among systems. (648.03b)  
\*8-9.PS.1.3.2 Analyze changes

			<p>that can occur in and among systems. (648.03b)</p> <p>*8-9.PS.1.3.3 Measure and calculate using the metric system. (648.03c)</p> <p>*These same content standards will be utilized in every unit through inquiry based scientific explorations.</p>
<p><b>Periodic Table</b></p>	<p><b>Life on Ocean Planet digital resource package:</b>  <i>PowerPoint Presentations on Chapters 8 &amp; 9</i>  <b>-Life on Ocean Planet Lab Manual</b> (Chapters 6 &amp; 7).  <i>The Nature of Water</i> (activities 1-3) and <i>Water, a Physically unique molecule</i> (activities 1-2).  <u><b>Activity Ideas:</b></u>  <b>-Periodic Table Mixer.</b></p> <p style="text-align: center;"><b>EXAM 2</b></p>	<p><b><i>The organization of the periodic table is based on the properties of the elements and reflects the structure of atoms. As a basis for understanding this concept:</i></b></p> <p>a. Students know how to identify regions corresponding to metals, nonmetals, and inert gases.</p> <p>b. Students know each element has a specific number of protons in the nucleus (the atomic number) and each isotope of the element has a different but specific number of neutrons in the nucleus.</p> <p>c. Students know substances can be classified by their properties, including their melting temperature, density, hardness, and thermal and electrical conductivity</p>	<p>8-9.PS.1.1.1 Explain the scientific meaning of system, order, and organization. (648.01a)</p> <p>8-9.PS.1.1.2 Apply the concepts of order and organization to a given system. (648.01a)</p> <p>8-9.PS.2.4.3 Describe the characteristics of isotopes. (650.01c)</p> <p>8-9.PS.2.4.1 Describe the properties, function, and location of protons, neutrons, and electrons. (650.01a)</p>
<p><b>Reactions</b></p>	<p><b>-Formative Assessment Probes Vol. 1</b> (Probes 5-9; 12).  <b>-Activity-A-Day Section 2</b>  <i>Interaction of Matter</i> (activities 2.1-2.12).</p> <p style="text-align: center;"><b>EXAM 3</b></p>	<p><b><i>Chemical reactions are processes in which atoms are rearranged into different combinations of molecules. As a basis for understanding this concept:</i></b></p> <p>a. Students know reactant atoms and molecules interact to form products with different chemical properties.</p> <p>b. Students know the idea of atoms explains the conservation of matter: In chemical reactions the number of atoms stays the same no matter how they are arranged, so their total</p>	<p>8-9.PS.2.4.2 Explain the processes of fission and fusion. (650.01b)</p> <p>8-9.PS.2.5.1 Explain how chemical reactions may release or consume energy while the quantity of matter remains constant. (650.03a)</p>

		<p>mass stays the same.</p> <p>c. Students know chemical reactions usually liberate heat or absorb heat.</p> <p>d. Students know physical processes include freezing and boiling, in which a material changes form with no chemical reaction.</p> <p>e. Students know how to determine whether a solution is acidic, basic, or neutral.</p>	
<b>2nd Quarter Topics</b>			
<b>Structure of Matter</b>	<p><b>-Formative Assessment Probes Vol. 2</b> (Probes 1-9).</p> <p><b>-Activity-A-Day Section 1 Structure of Matter</b> (activities 1.1-1.12).</p> <p><b>-Brain Powered Science Activity #16</b> "Air Mass Matters"</p> <p><b>-Brain Powered Science Activity #27</b> "Invisible Gases Matter"</p> <p><b>-Brain Powered Science Activity #11</b> "Super absorbent Polymers"</p> <p><b><u>Activity Ideas</u></b></p> <p>-Creating Crystals</p> <p>-Skittle Activity</p> <p>-Creating Isotopes</p> <p>-Dance Analogy: Molecule Moshing.</p> <p style="text-align: center;"><b>EXAM 4</b></p>	<p><b><i>Each of the more than 100 elements of matter has distinct properties and a distinct atomic structure. All forms of matter are composed of one or more of the elements. As a basis for understanding this concept:</i></b></p> <p>a. Students know the structure of the atom and know it is composed of protons, neutrons, and electrons.</p> <p>b. Students know that compounds are formed by combining two or more different elements and that compounds have properties that are different from their constituent elements.</p> <p>c. Students know atoms and molecules form solids by building up repeating patterns, such as the crystal structure of NaCl or long-chain polymers.</p> <p>d. Students know the states of matter (solid, liquid, and gas) depend on molecular motion.</p> <p>e. Students know that in solids the atoms are closely locked in position and can only vibrate; in liquids the atoms and molecules are more loosely connected and can collide with and move past one another; and in gases the atoms and molecules are free to move independently, colliding frequently.</p> <p>f. Students know how to use the</p>	<p>8-9.PS.1.1.2 Apply the concepts of order and organization to a given system. (648.01a)</p> <p>8-9.PS.2.4.1 Describe the properties, function, and location of protons, neutrons, and electrons. (650.01a)</p> <p>8-9.PS.2.4.4 State the basic electrical properties of matter. (650.01d)</p>

		periodic table to identify elements in simple compounds.	
		<b>Read Mission 2 from Jason Project's infinite potential and Mission 4 from Tectonic Fury</b>	
<b>Forces</b>	<p><b>-Activity-A-Day Section 3 Interaction of Matter (activities 3.1-3.12).</b></p> <p><b>-Jason Project Infinite Potential (Coaster Creator).</b></p> <p><b>-PowerPoint presentation Chapter 13.</b> Life on Ocean Planet (digital resource package).</p> <p>-Egg Drop activity</p> <p style="text-align: center;"><b>EXAM 5</b></p>	<p><b>Unbalanced forces cause changes in velocity. As a basis for understanding this concept:</b></p> <p>a. Students know a force has both direction and magnitude. b. Students know when an object is subject to two or more forces at once, the result is the cumulative effect of all the forces.</p> <p>c. Students know when the forces on an object are balanced; the motion of the object does not change.</p> <p>d. Students know how to identify separately the two or more forces that are acting on a single static object, including gravity, elastic forces due to tension or compression in matter, and friction.</p> <p>e. Students know that when the forces on an object are unbalanced, the object will change its velocity (that is, it will speed up, slow down, or change direction).</p> <p>f. Students know the greater the mass of an object, the more force is needed to achieve the same rate of change in motion.</p> <p>g. Students know the role of gravity in forming and maintaining the shapes of planets, stars, and the solar system.</p>	<p>8-9.PS.2.2.1 Explain motion using Newton's Laws of Motion. (650.04b)</p> <p>8-9.PS.2.3.1 Explain that energy can be transformed but cannot be created nor destroyed. (650.05a)</p> <p>8-9.PS.2.3.2 Classify energy as potential and/or kinetic and as energy contained in a field. (650.05b)</p>
<b>3rd Quarter</b>			
<b>Motion</b>	<p><b>-Formative Assessment Probes Vol. 2 (Probes 10-11).</b></p> <p><b>-Jason Project</b></p>	<p><b>The velocity of an object is the rate of change of its position. As a basis for understanding this concept:</b></p> <p>a. Students know position is defined</p>	<p>8-9.PS.2.2.1 Explain motion using Newton's Laws of Motion. (650.04b)</p> <p>8-9.PS.2.3.1 Explain that energy can be</p>

	<p><b>Infinite Potential</b> Mission 1 Lab 2 <i>Balloon rockets.</i> -Mission 2 Lab 1 <i>Energy Transfers</i> -Coaster Creator digital lab</p> <p><b><u>Activity Ideas:</u></b> -Racecar Track -Rube Goldberg -Calculating the speed of passing cars.</p> <p style="text-align: center;"><b>EXAM 7</b></p>	<p>in relation to some choice of a standard reference point and a set of reference directions.</p> <p>b. Students know that average speed is the total distance traveled divided by the total time elapsed and that the speed of an object along the path traveled can vary.</p> <p>c. Students know how to solve problems involving distance, time, and average speed.</p> <p>d. Students know the velocity of an object must be described by specifying both the direction and the speed of the object.</p> <p>e. Students know changes in velocity may be due to changes in speed, direction, or both.</p> <p>f. Students know how to interpret graphs of position versus time and graphs of speed versus time for motion in a single direction.</p>	<p>transformed but cannot be created nor destroyed. (650.05a) 8-9.PS.2.3.2 Classify energy as potential and/or kinetic and as energy contained in a field. (650.05b)</p>
<p><b>Energy Waves</b></p>	<p><b>-Activity-A-Day</b> <i>Section 4</i> <i>Interaction of Matter (activities 4.1-4.12).</i> <b>-PowerPoint Presentation on Chapter 12</b> (Life on Ocean Planet digital resource package). <b>-Life on Ocean Planet Lab Manual</b> (Wave activities)</p> <p style="text-align: center;"><b>EXAM 8</b></p>	<p>a. Students know waves carry energy from one place to another.</p> <p>b. Students know how to identify transverse and longitudinal waves in mechanical media, such as springs and ropes, and on the earth (seismic waves).</p> <p>c. Students know how to solve problems involving wavelength, frequency, and wave speed.</p> <p>d. Students know sound is a longitudinal wave whose speed depends on the properties of the medium in which it propagates.</p> <p>e. Students know radio waves, light, and X-rays are different wavelength bands in the spectrum of electromagnetic waves whose speed in a vacuum is approximately <math>3 \times 10^8</math> m/s (186,000 miles/second).</p> <p>f. Students know how to identify the characteristic properties of waves: interference (beats), diffraction, refraction, Doppler effect, and polarization.</p>	<p>8-9.PS.2.4.5 Describe the relationships between magnetism and electricity. 8-9.PS.2.4.4 State the basic electrical properties of matter. (650.01d)</p>

<p><b>4th Quarter Topics</b></p>	<p>Read Mission's 3 &amp; 4 from Jason Project's infinite potential.</p>		
<p><b>Density &amp; Buoyancy</b></p>	<p>-<b>Formative Assessment Probes Vol. 2</b> (Probes 3).          -<b>Brain Powered Science Activity #31</b> "Floating &amp; Sinking"          -<b>Brain Powered Science Activity #32</b> "Cartesian Diver"  <u><b>Activity Ideas:</b></u>          -Game show: Will it sink.  <b>EXAM 9</b></p>	<p><b>All objects experience a buoyant force when immersed in a fluid. As a basis for understanding this concept:</b></p> <p>a. Students know density is mass per unit          a. Students know density is mass per unit volume.          b. Students know how to calculate the density of substances (regular and irregular solids and liquids) from measurements of mass and volume.          c. Students know the buoyant force on an object in a fluid is an upward force equal to the weight of the fluid the object has displaced.          d. Students know how to predict whether an object will float or sink.</p>	
<p><b>Chemistry of Living Things</b></p>		<p><b>Principles of chemistry underlie the functioning of biological systems. As a basis for understanding this concept:</b></p> <p>a. Students know that carbon, because of its ability to combine in many ways with itself and other elements, has a central role in the chemistry of living organisms.          b. Students know that living organisms are made of molecules consisting largely of carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur.          c. Students know that living organisms have many different kinds of molecules, including small ones, such as water and salt, and very large ones, such as carbohydrates, fats, proteins, and DNA.</p>	<p>*8-9.PS.1.3.1          Measure changes that can occur in and among systems. (648.03b)          *8-9.PS.1.3.2          Analyze changes that can occur in and among systems.</p>
	<p><b>FINAL EXAM</b></p>		

## 10. Grading Policy:

- a. Grades will be weighted based on the following categories:
  - i. **Labs/Activities/Projects: 40%**
  - ii. **Exams/Tests: 30%**
  - iii. **Portfolio/Homework/Quizzes: 20%**
  - iv. **Science Journal/Classroom Participation: 10%**
- b. Absolutely no late work will be accepted past the assignment due dates.
- c. Students must pass class with a C or higher to receive credit for class. Please refer to the following grading scale: For both middle school and high school transcripts, grades are dependent on semesters, not quarters. Quarters are essentially a progress report grade for the semester. VCS will continue to give quarter grades, but the semester grades will be based on the entire points for the semester instead of an average of the two quarter grades.

### 4.0 Scale Percentage Letter Scale

Grade Value
100-98 A+ 4.0
97-94 A 4.0
93-90 A- 3.67
89-87 B+ 3.33
86-84 B 3.0
83-80 B- 2.67
79-77 C+ 2.33
76-74 C 2.0
73-70 C- 1.67
69-67 D+ 1.33
67-60 D 1.0
59-0 F 0.0

## 11. Course Policies:

- a. **Assignments:** all assignments are due at the beginning of the period on the assignment due date. Assignments must be completed in pencil or ink (if an assignment is turned in otherwise, it won't be accepted) and all questions must be answered in complete sentences. It is the student's responsibility to turn their assignment into the in-box during the first 5 minutes of class (unless we are grading the assignment in class that day). An assignment will be considered late, if it is turned in beyond this time.
- b. **Late Work:** Unexcused late work will NOT be accepted. Unexcused late work will be an automatic zero.
- c. **Make-up work (due to excused absences):** It is the student's responsibility to check their class folder and check with the teacher concerning any make-up work following an excused absence. This should be done before or after school, during nutrition break, or at the beginning of lunch. All labs and exams must be made up at school during a time scheduled by the teacher and the student. Students will have two calendar days for an excused absence to make up work. (For example, if a student is absent Thursday, they will request their make-up work on Friday and the work will be due Tuesday. It is the student's responsibility to request make-up work. For a pre-arranged absence, make-up

work will be requested from the teacher before the absence. When a student has had an excused absence for three consecutive days, the parent may request make-up work be sent to the office for pick up. Requested work will be available the next school day by 3:30 pm. This should be done before or after school, during nutrition break, or at the beginning of lunch. All labs and exams must be made up at school during a time scheduled by the teacher and the student.

- d. **Attendance & Tardiness:** Students who miss more than 6 days during a semester will not receive credit for the class even if they held a passing grade prior to the absences (please refer to the VCS handbook for more detail). ***A student is considered tardy if they are not in their seat and started on their Science Journal when class begins.*** All bathroom and water breaks must be taken in between classes.

**12. Class Guidelines & Procedures:** I only have 5 rules.

- i. Respect your teacher, your classmates, the class environment, and yourself.
- ii. Do not talk while the teacher is talking or another student is sharing information with the class.
- iii. When I want your attention I will raise my hand. You will raise your hand, stop what you are doing, and put your eyes on me.
- iv. Don't compare yourself to others, do your best and take pride in your work.
- v. Have fun, but never at the expense of others.

**13. Consequences for not following classroom procedures:**

- a. First student will be warned privately.
- b. Second students will be removed from class for the day and will need to make up the time wasted either through extra physical activity or lunchtime detention.
- c. Third, student's parents will be contacted for possible conference and behavioral plan.
- d. Fourth, Students will receive discipline referral (loss of school socials, zero for the day, and meeting with administrator) which might include community service hours or possible suspension.

\*This Syllabus is your roadmap for this school year, please print a copy and do not lose it. Your first assignment this year is to review the syllabus with your parent(s) or guardian and both parties need to sign stating that they understand and agree to the information presented here in the syllabus. Let's make this an amazing year. Please fill out the following information, sign, detach, and return to your student's teacher.

Please fill out information below, sign, and return to your student's teacher.

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Student Name: \_\_\_\_\_

Parent/Guardian Name: \_\_\_\_\_

Contact information: (phone) \_\_\_\_\_ (email) \_\_\_\_\_

Student Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Parent/Guardian Signature: \_\_\_\_\_ Date: \_\_\_\_\_