**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Score           /350**

**Unit Newton’s Laws of Motion**

PSc 1.1 Understand motion in terms of speed, velocity, acceleration and momentum

PSc1.2 Understand the relationship between forces and motions

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Instructions: Below are the activities you can choose from to earn points for this unit. Start with the C activities. These will help you learn the basics of the unit. **Activities in bold are required for every student**. After you have enough points in the C section, move on to section B and then A for more challenging activities. Here's how to get the grade you want:

F: 0 - 210 C points

D: 211 - 240 C points

C: 241 - 280 C points

B: 280 C points and 5 - 35 B points

A: 280 C points, 35 B points, and 5 - 35 A points

When you are finished with an activity, you must sit down and discuss what you've learned with Mrs. Bennett and o. **You may not turn in more than two activities on the last day of the unit.**

Resources for worksheet:

Worksheet packet for Unit Newton’s three laws of Motion

<http://www.glencoe.com/sites/common_assets/workbooks/science/GlencoePhysicalScienceNC/gps626.pdf>

**C Activities**

|  |  |  |  |
| --- | --- | --- | --- |
| ***Description*** | ***Bloom’s taxonomy*** | ***Points*** | ***Score*** |
| **1.Take Cornell notes on the entire unit.** | Knowledge | **20**  **5** |  |
| **2.**  **Self check Quiz 1**  **Self check Quiz 2**  **Self Check Quiz3**  [**http://glencoe.mheducation.com/sites/0078600510/student\_view0/unit1/chapter2/section\_1\_self-check\_quiz-eng\_.html**](http://glencoe.mheducation.com/sites/0078600510/student_view0/unit1/chapter2/section_1_self-check_quiz-eng_.html)  **Mini-labs on Newton’s Law of motion**  http://teachers.net/lessons/posts/661.html | **Application** | **30**  **30**  **30** |  |
| **3.Working Cooperatively**  For one day, write down a brief description of the different kinds of motions you can see. Work with a group to generate a common list of the different kinds of motions observed. What reference points did you use to detect the motion?  How did these reference points help you determine motion? Compare your list with those from other groups in your class.  Write the questions and write answers.  Page 341 problem 36 | Comprehension | **40** |  |
| **4.Complete the Gak Lab**  **Complete the lab answer the questions** | Synthesis | **30** |  |
| **5.Read Chapter 10**  On page 328 complete questions 1-5  Write the questions and write the answers | **Application** | **10** |  |
| **6.Interpreting Data**  Bob straps on his in-line skates and pushes down a hill. His velocity changes from 0m/s at the start or 4.5 m/s exactly 15 s later. What is Bob’s average acceleration.  Page 339 Holt Textbook problem 22 | Application | 10 |  |
| **7.Drawing Conclusion**  What can you conclusions. What can you conclude about the forces acting on an object traveling in uniform circular motion?  Holt Text page 340 problem 33 | Analysis | 10 |  |
| **8.Applying Knowledge**  When you drive, you will sometimes have to decide in a brief moment whether to stop fora yellow light. Discuss the variables you must consider in making your decision. Use the concepts of force, acceleration  And velocity in your discussion.  Holt textbook page 340 problem 34 | Knowledge | 20 |  |
| 9.Calculate the Momentum  What is the momentum of a 100-kg football player running at a speed of 4 m/s.  Calculate force  What is the force exerted by a catcher’s glove on a 0.15-kg baseball moving at 35m/s that is stopped in 0.02s?  Glencoe Textbook page 88 problem # 7 | Analysis | 20 |  |
| 10.Graphing Skills  Holt Textbook page 337  Complete questions 1-7  Write the questions write the answers | Analysis | 20 |  |
| 11.Lab Measuring the Effects of Air Resistance  REAL WORLD QUESTION  How does air resistance affect the acceleration of falling objects.  If you dropped a bowling ball and a feather from the same height on the Moon, they would both hit the surface at the same time. All objects dropped Earth are attracted to the ground with the same acceleration. But on Earth, a bowling ball and a feather will not hit the ground at the same time. Air resistance slows the feather down.  Glencoe Textbook page 89 | Analysis | 20 |  |
| 12.Creative Thinking  What are some of the ways that competitive swimmers can decrease the amount of friction or drag between themselves and the water they are swimming through? How does each method work to decrease friction?  Write a half page essay on this particular topic. | Analysis | 20 |  |
| 13. Suppose you wanted to increase the pH of a solution. What could you add to the solution to increase the pH? Explain your prediction? |  | 20 |  |
| **14.Using Vocabulary**  Holt textbook page 339  Answer Questions 12-21  Write all questions out, give complete answers. | Knowledge | 20 |  |
| **15.Read Chapter 10 of the Holt Textbook page 338**  **Complete questions 1-11** | Knowledge | 20 |  |
| Section 3 Review  Holt textbook page 336  Write the questions 1-6 Write the answers | Knowledge | 20 |  |
| 16.Group Activity  Ice Racing-  The sport of ice racing has been transformed by modern materials and suit and helmet designs that minimize air resistance, and by skate designs that minimize air resistance, and by skate designs that minimize friction.  Use your electronic devices or the internet to find out ways that technology has been applied to ice racing. You will make a short presentation to the class with the result. | Evaluation | 30 |  |
| 17.Complete the following Quiz –Whole Class activity  Holt Textbook page 336 1-5  Write the questions and write the answers | Comprehension | 30 |  |
| 18.Mini Lab on Inertia  Observing Inertia in Action  Create an inclined plane between 25’ and 50’ using a board and textbooks  Glencoe textbook --- worksheet package page 7  http://www.glencoe.com/sites/common\_assets/workbooks/science/GlencoePhysicalScienceNC/gps626.pdf | Analysis | 40 |  |

**B Activities**

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| --- | --- | --- | --- |
| ***Description*** | ***# of Periods*** | ***Points*** | ***Score*** |
| 19. **Do Now (warm-up for the week of November 10th-14th** | knowledge | 5 |  |
| 20. Use the Internet to complete research  Methods of travel  Page 13  How long does it take you to get to the other side of the country. If you were planning a trip from New York City to Los Angeles.  <http://www.potosisd.k12.wi.us/staff/hutchcroft/Science%20Notes/Chapter%205%20Motion,%20Forces,%20and%20Simple%20Machines.pdf> | synthesis | 20 |  |
| **21.Newton’s Law of Motion foldable**  http://images.pcmac.org/SiSFiles/Schools/GA/BryanCounty/RHMiddle/Uploads/DocumentsCategories/Documents/Newtons%20Laws%20foldable%20(Youmans-with%20answers).pdf | Analysis | 20 |  |
| 22.Rocket Balloon  A rocket’s movement depends on Newton’s 3rd law of motion-For every action there is an equal and opposite reaction.  When a rocket blows out gas at high speed in one direction (action force) the rocket is pushed in the opposite direction.  Problem: To observe Newton’s Third Law of Motion  http://science-class.net/archive/science-class/Lessons/Physics/Force\_Motion/balloon\_rockets.pdf | Synthesis | 20-40 |  |

**A Activities**

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| --- | --- | --- | --- |
| ***Description*** | ***# of Periods*** | ***Points*** | ***Score*** |
| 23.Frame of reference worksheet  http://images.pcmac.org/SiSFiles/Schools/GA/BryanCounty/RHMiddle/Uploads/DocumentsCategories/Documents/Notes10%201.pdf | Knowledge | 10 |  |
| **24.Force and Motion Quiz**  http://images.pcmac.org/SiSFiles/Schools/GA/BryanCounty/RHMiddle/Uploads/DocumentsCategories/Documents/Force%20%20Motion%20quiz.pdf | Application | 20 |  |
| 25. Writing Fiction Story  1) Ask the students to write a 2 to 3 page science fiction story describing what differences we would observe if the opposite of Newton's three laws were true on earth. For example, guns would not have recoil, and a cannon's mass would not have to be greater than a cannon ball. You would also not be pushed back in your seat when undergoing acceleration in a car.  2) As an alternative, you may wish to do a verbal brainstorming of how things on earth would be different if we lived under the reverse of Newton's laws | Analysis | 20 |  |
| **26.Unit Project : Newton’s 3 Laws of Motion Webquest**  This webquest is a fun way to learn about and apply Newton's three laws of motion.  One way that something can change is simply by traveling to a new location. When an object changes its position, we call the change motion. Isaac Newton formulated three laws that apply to every motion in the universe. To understand how this change works and what forces are needed to generate this type of change, this webquest will guide you along the way in your discovery of Newton's three laws.  http://www.bryan.k12.oh.us/userfiles/65/Classes/3350/newtonswebquest.pdf%20 | Evaluation | 40 |  |
| ***Extension Activity—Extra Credit*** | ***# of Periods*** | ***Points*** | ***Score*** |
| 27.Balloon Racing  Car Design  You will build your own balloon racer demonstrating Newton's three laws. This fun task lets you put all of your new knowledge and creativity to work. And of course, what is a race without a top prize!!!   1. The rules to this activity are simple: •The car must be powered by balloons. 2. •You can build the car out of anything. 3. •It must have at least three wheels. Wheels are defined as anything that is round and goes around. 4. •The wheels cannot be wheels from a toy car. They must be made out of something that was not originally meant to be used as wheels. 5. •The car may not leave the ground. 6. •The car must be capable of traveling at least 5 meters   http://teachertech.rice.edu/Participants/louviere/Newton/balloonracers.html | Synthesis | 10 |  |
| 28.Car Race  On race day we will set up a track down a long hallway. You will race in pairs against other classmates. Cars that follow all of the rules will be eligible for awards. These awards will be given in three categories:  •Best Looking Car  •Fastest Car (in first 5 meters)  •Farthest Distance Traveled | Application | 10 |  |
| 29.Instruction Manual  As you are building your racer, you will need to write and design a manual explaining to others how to build it. Your manual will need to be made using technology and must include diagrams. | Synthesis | 25 |  |
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**Additional Science Resources:**

Cnnstudentsnews.com

**Interactive Online Edition**

**http://go.hrw.com/gopages/sc-ms.html**

**Go.hrw.com**

**Holt online learning-----** [**www.hrw.com**](http://www.hrw.com)

**Gohrw.com visit the HRW site for a variety of free resources related to the text. Keyword—HK4MOT**

www. Scilinks.org

Topic: Motion

SciLinks code HK4091