Energy skate park conservation of energy lab answers

Reorienting to download Energy Skate Park Lab PDF Responses after Second Kinetic Energy Conservation Potential Original Energy Sim and Translations Energy Conservation Kinetic Energy Thermal Energy Energy Friction Learn about energy conservation with a skater girl! Explore different tracks and look at kinetic energy, potential energy and friction as you move. Build your own tracks, ramps and jumps for the skater. Example of learning objectives Explain the concept of mechanical energy conservation using kinetic energy (KE) and gravitational potential energy (PE). Describe how the power bar and pie charts relate to position and speed. Explain how changing skater mass affects energy. Explain how changing track friction affects energy. Predict the position or estimate the speed of the power bar and pie charts. Calculate the speed or height at a position from information about a different position. Calculate KE and PE in a position based on information about a different position. Design a skate park using the concepts of mechanical energy and energy conservation. Version 1.1.19 Overview of sim controls, model simplifications and information about student thinking (PDF). 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Energy & Momentum Janet Chen (陳杉豫), Aien Charity Grace White (白愛恩), Jonathon David White (白小明) UG-Intro RemoteGuidedLab Physics Conservation Of Mechanical Energy Mohammad Khan UG-Intro Lab Physics Conservative and non-conservative forces Osama Abdulghani UG-Intro Lab Physics Conversation of Mechenical Energy Haya alzaben Grad RemoteLab Physics Energy Skate Park: Basics Ghadeer Abdulla A Almahwity UG-Intro HWGuidedLabOther Physics MS and HS TEK to Sim Alignment Elyse Zimmer MSHS Other ChemistryBiologyPhysics Lab Experiment Mohammad Mansour HSUG-Intro RemoteLab Physics Kinetic, Potential and Total Energy: Claim, Evidence, Reasoning Ann Baxley HSMS OtherGuided Physics Atividade Energia Mecânica gamificada Darkson F. Costa; José M. V. Gomes; Gilvandenys L. Ventas. 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The energy conservation law tells us that we can never create or destroy energy, but we can change its shape. In this laboratory, we will see the conversion of energy between energy of gravitational potential, work and kinetic energy (or in motion). This conversion is known in physics as work. (Understand however, that in real life, skate wheels have friction. In our experiments, we ignore friction) When friction is present, negative work is performed and energy is converted into thermal energy. Energy is measured in Joules units. Important Formulas: KE - 12 mv2 PE - mgh Procedure: PheT Simulations ✉ Play with Sims ✉ Energy Skate Park - Take a few moments to play with the skater and its track. • Make on the buttons to display the energy charts and pastel cake These graphs show the conversion between kinetic energy (green) and potential energy (blue). If power is lost, it will be displayed with a red bar (thermal power loss). • Reset the skater to the standard half tube and observe the energy bars as it moves back and forth (frictionless). As the skater drops its kinetic energy (green) increases and its potential energy (blue) decreases. The change in kinetic energy is always the same as the change in potential energy. • Change the skater with . Is the energy conservation law affected by the skater's mass? No - Does the skater's mass affect the magnitudes of kinetic and potential energy? _Yes Reset and drag the bottom of the half pipe to the bottom of the grid to set the lowest height to zero. • Turn on the grille. Set the PhET skater (75kg) to 5.0m above zero and let it skate. How much potential energy does it have at 5.0 m? _3750 J_ How much kinetic energy at 0.0 m? Zero_ a 20.0 kg skater who starts his 10m-tall skate (on earth) would have a potential energy of _2000 J_ and a kinetic energy of zero before his skate. At the lowest point, the skater would have a potential energy of zero and a kinetic energy of 2000 J. (track: use the important formula for potential energy) Create a skating path as shown. If the skater starts on the left side, will he have enough energy to get to the right side? _No why? / Why not? Energy conservation. It will only reach an equivalent height. A E C If the skater starts at A on the left on the way here, match the letter here with the following conditions: 1. Maximum kinetic energy D 2. Maximum potential energy B A B 3. Two places where the skater has approximately the same speed C and E If the skater starts at the top of this ramp on the left, show how high it will be on the right side of the ramp. Try this in the simulation. Press to zoom out and increase the ramp size. Part II: The gravity effect on the skater's energy reset and activates the pie chart to show kinetic and potential energy. • Move the skater to Jupiter, where acceleration due to gravity is 26m/s 2! Describe what happens to the skater's potential and kinetic energy. Both change in the same way as on earth, but faster - Move the skater to the moon (g to 1.6 m/s2). Why does he move like him? It moves more slowly because the pull of the moon's gravity is less than earth's. • Zoom out, increase the size of the ramp, and move the skate into space! Press the arrow keys on your keyboard. Get a little further away. Have fun. Is there potential energy (mgh) in space? / Why not? _g in mgh is zero in space Is there kinetic energy (1/2mv2) in space? Yes_Why / Why not? _There is mass and speed in space Part II: Thermal energy In the real world, friction is present. Click Track Friction and away from none. Experiment Experiment This. Look at the graphs of the energy bars. What finally happens to the skater's initial potential energy? _________________Will thermal energy become PE or KE again? ___________________ All potential energy is eventually converted into thermal energy. No, we can't convert thermal energy into useful mechanical energy. Conclusion calculations: (1/2 st each) use g to 10. m/s2 Complete the table of kinetic and potential energies: Skater mass (m) height (h) 20. kg 14 m 60. kg 0.0 m 0.20 kg 18 m 0.0 m/s 6.0 m 5.0 m/s 7. 10 kg 5.0 kg 9. 17 m Conclusion Questions: speed (v) 12 m/s 3. Kinetic energy (KE) 1. 1440 J 1470 J 7 m/s 10. 0J 8. 125 J 5. 8.0 m/s Potential energy (PE) 2800 J 4. 0 J 6. 36 J 2. 160 J 600. J 850 J (1/2 st each) use g to 10. m/s2 In questions 1 – 3, circulate the word making a correct statement. 1. At the highest point the kinetic energy is zero/maximum while the potential energy is zero/maximum. 2. At the lowest point the kinetic energy is zero/maximum while the potential energy is zero/maximum. 3. Mass affects/does not affect energy conservation. 4. How much potential energy does 60. kg skater have before she starts her walk, 12 m above the ground? 7200 J 5. How much kinetic energy does a 60.0 kg skater have traveling at a speed of 4 m/s? 480 J 6. How fast he owes a 20. kg skater travel to have a kinetic energy of 360 jousting? 6 m/s 7. How high does a 2.0 kg basketball have to be launched for it to have a potential energy of 160 J? 8m 8. How fast should 2.0kg basketball be thrown up to achieve the same 160 J? 12.7 m/s 9. If a 75 kg skater starts its skate at 8.0 m, at its lowest point, it will have a speed of 12.7 m/s 10. In the previous question, all potential energy became kinetic energy. How much work did gravity force do? The work performed by gravity is equal to the force of gravity (weight) times the distance moved from top to bottom (Weight * height or mgh) In other words, the work done is equal to the change in gravitational energy. So 6000J. Gravity has put 6000J in the system. Tracking exploration: In the real world, friction is present. Click Track Friction and away from none. Experiment with this. Look at the graphs of the energy bars. What finally happens to the skater's initial potential energy? _________________Will thermal energy become PE or KE again? ___________________ All potential energy is eventually converted into thermal energy. No, we can't convert thermal energy into useful mechanical energy. Energy.

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