|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 7.P.2 Understand forms of energy, energy transfer and transformation and conservation in mechanical systems.  7.P.2.1 Explain how kinetic and potential energy contribute to the mechanical energy of an object.  7.P.2.2 Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).  7.P.2.3 Recognize that energy can be transferred from one system to another when two objects push or pull on each other over a distance (work) and electrical circuits require a complete loop through which an electrical current can pass.  7.P.2.4 Explain how simple machines such as inclined planes, pulleys, levers and wheel and axels are used to create mechanical advantage and increase efficiency. | | | | | |
| Text Resources | | | | | |
| Essential Standards | Textbook | Discovery Education | Manipulative Activities | Graphics/Models | Other Resources |  |
| 7.P.2.1 | •        [Class Zone Textbook Support Materials- Energy](http://www.classzone.com/books/ml_science_nc6/page_build.cfm?id=resour_ch1&u=2)  •        Section 4.2 Unit D Energy is transferred when work is done pages 121D- 129D | •    [Exploring energy quiz](http://tools.discoveryeducation.com/quiz/viewQuiz.cfm?guidAssetId=11C80AC7-6A93-4744-8693-A90C3BCDDC79&blnFromSearch=1&productcode=DSCE&strEditCopy=Copy)  •    [Interactive Glossary for Mechanical Energy](http://player.discoveryeducation.com/index.cfm?guidAssetId=D028D374-6CA0-4605-9F5F-7CE232F2269C&blnFromSearch=1&productcode=DSCE)  •    [Getting to Know Energy Article](http://player.discoveryeducation.com/index.cfm?guidAssetId=4BB433F0-C2CD-4A72-9B81-67864819C03A&blnFromSearch=1&productcode=DSC) | •    [Kinetic and Potential Energy Lab](http://www.sciencewithskinner.com/files/IPS/Work/pkelab.pdf)  •    [Mechanical Energy Lab](Force&Motion/Mechanical%20Energy%20Lab.doc)  •    [Ball Bounce Lab](http://isite.lps.org/nmyers2/web/documents/dsBallBounceLabPotentialEnergy.pdf) | •        [KE and PEsong](http://www.youtube.com/watch?v=KkkEIKR3N8M)  •        [The Power Kids](http://www.choptankelectric.com/kids/energyfacts.html)  •        [Exploring KE and PE](http://www.solpass.org/5s/AP/4.2scienceactivity.htm) | •        [Warm-up: Potential and Kinetic Energy](http://player.discoveryeducation.com/index.cfm?guidAssetId=DFC23F68-0F9B-4BD7-950A-8C2FBF130554&blnFromSearch=1&productcode=DSC)  •        [EnergyPractice](http://www.cpo.com/home/Portals/2/Media/post_sale_content/FPS%203rd/Ancillaries/U3/U3_Skill_and_Practice_Sheets/FPS_U3_SS.pdf" \t "_blank) |  |
| 7.P.2.2 | •        Section 4.2 Unit D Energy is transferred when work is done pages 121D- 129D | •        [Energy Transfer](http://player.discoveryeducation.com/index.cfm?guidAssetId=6C827EA3-5756-4F8B-ABCE-87CFA63B9617&blnFromSearch=1&productcode=DSC)  •        [Knock the Pin to Win](http://player.discoveryeducation.com/index.cfm?guidAssetId=E234FD74-7A07-4951-A8E4-660D649FADB1&blnFromSearch=1&productcode=DSC)  •        [PE and KE Short Response Question](http://player.discoveryeducation.com/index.cfm?guidAssetId=34EA5736-B757-49E1-B93E-54E28C9C526A&blnFromSearch=1&productcode=DSC) | •        [Roller Coaster Project](Force&Motion/ROLLER%20COASTER.doc) | •    [Potential and Kinetic Energy](http://www.classzone.com/books/ml_science_share/vis_sim/mem05_pg69_potential/mem05_pg69_potential.html)  •    [Roller Coaster](http://www.classzone.com/books/ml_science_share/vis_sim/mfm05_pg126_coaster/mfm05_pg126_coaster.html) | •    [Transfer of Energy](http://www.kids.esdb.bg/index.html)  •    [Kinetic Sculpture Video](http://www.guardian.co.uk/science/video/2012/mar/28/science-kinetic-sculpture-video)  •    [How Roller Coasters Work](http://science.howstuffworks.com/engineering/structural/roller-coaster3.htm) |  |
| 7.P.2.3 | •        [Class Zone Textbook Support Materials- Work](http://www.classzone.com/books/ml_science_nc7/page_build.cfm?id=resour_ch4&u=4)  •        Section 4.1 Unit D Work is the use of force to move an object pages 115D-119D | •    [Work and Energy Quiz](http://tools.discoveryeducation.com/quiz/viewQuiz.cfm?guidAssetId=955747C1-E394-4469-B9CA-C4DCF587A0A7&blnFromSearch=1&productcode=DSCE&strEditCopy=Copy)  •    [Electrical Energy](http://player.discoveryeducation.com/index.cfm?guidAssetId=1A892670-68FE-4EF6-B9FE-31BC3DF9BA60&blnFromSearch=1&productcode=DETB)  •    [Getting Wired](http://player.discoveryeducation.com/index.cfm?guidAssetId=7AA0D0CB-B4F9-4332-B189-2C193BD7B266&blnFromSearch=1&productcode=DETB)  •    [Getting Connected](http://player.discoveryeducation.com/index.cfm?guidAssetId=EC445E38-61FC-46A4-9B80-8222AF192007&blnFromSearch=1&productcode=DETB)  •    [Science Sleuths- The Alarming Episode](http://player.discoveryeducation.com/index.cfm?guidAssetId=062FA33B-810F-48E2-8D60-5AA3ADF1335A&blnFromSearch=1&productcode=DETB) | •  [Circuits](http://www.classzone.com/books/ml_science_share/vis_sim/emm05_pg41_circuits/emm05_pg41_circuits.html)  •  [Thermal Energy Transfer](http://player.discoveryeducation.com/index.cfm?guidAssetId=5B742D74-91C3-4EC2-81C0-1C169007C11A&blnFromSearch=1&productcode=DETB)  •  [Hands-on Activity: WaterWheel](http://player.discoveryeducation.com/index.cfm?guidAssetId=E723C513-AE39-403C-9B63-E9CFE279186C&blnFromSearch=1&productcode=DETB) | •  [Mechanical Energy](http://www.physicsclassroom.com/class/energy/u5l1d.cfm)  •  [Current Electricity](http://www.physicsclassroom.com/Class/circuits/)  •  [Work, Energy, and Power](http://www.physicsclassroom.com/curriculum/energy/energy.pdf) | • [Thermal Energy Reading Passage](http://player.discoveryeducation.com/index.cfm?guidAssetId=60C411E0-5EF2-4963-8512-048D7D9BED6B&blnFromSearch=1&productcode=DETB)  • [Electromagnetic Waves Song](http://player.discoveryeducation.com/index.cfm?guidAssetId=8588A3E1-ABEF-4026-AD55-1B27F7C54EE9&blnFromSearch=1&productcode=DETB)  • [Electric Circuits](http://www.physicsclassroom.com/curriculum/circuits/index.cfm) |  |
| 7.P.2.4 | •        [Class Zone Textbook Support Materials- Simple Machines](http://www.classzone.com/books/ml_science_nc7/page_build.cfm?id=resour_ch5&u=4)  •        Section 5.1 Unit D Machines help people do work pages 145D-152D  •        Section 5.2 Unit D Six simple machines have many uses pages 154D-162D | •        [The Wheel Deal](http://player.discoveryeducation.com/index.cfm?guidAssetId=CE18E8E9-281B-4739-9CFE-B0CC6C84991C&blnFromSearch=1&productcode=DETB)  •        [The Six SimpleMachines](http://player.discoveryeducation.com/index.cfm?guidAssetId=E422DD91-2EDE-45CE-9B55-FDCE4FC9407D&blnFromSearch=1&productcode=DETB)  •        [Simple Machine Song](http://player.discoveryeducation.com/index.cfm?guidAssetId=2426B81F-D521-44E5-A9D8-1EBEC4763FA1&blnFromSearch=1&productcode=US) | •        Levers as Machines Power Point  •        [SimpleMachines Warm-Up](http://player.discoveryeducation.com/index.cfm?guidAssetId=C97BF7A2-C66D-4220-946B-278C2F0AABFB&blnFromSearch=1&productcode=DETB" \t "_blank)  •        [Simple Machine Tic-Tac-Toe](Force&Motion/7P1%20Simple%20Machine%20Tic%20Tac%20Toe.pdf) | • [Inventors Toolbox](http://www.mos.org/sln/Leonardo/InventorsToolbox.html)  • [Hidden Helpers](http://sln.fi.edu/qa97/spotlight3/spotlight3.html)  • [Simple Machine Glossary Term](http://player.discoveryeducation.com/index.cfm?guidAssetId=9326B720-D842-4665-982D-C5C02EC6CCAF&blnFromSearch=1&productcode=DETB) | • [Physics Scavenger Hunt](http://sciencespot.net/Media/physscavht.pdf)  • [Artificial Limb Activity](Force&Motion/artificial.limb.docx)  • [Simple Machine Project](Force&Motion/SIMPLE%20MACHINE%20PROJECT.doc) |  |

1.       Using the article [How a Roller Coaster is Made](http://www.madehow.com/Volume-6/Roller-Coaster.html), learn about the two types of materials that have been used to create a roller coaster (wood and steel). Traditionally roller coasters were made of wood, but in today’s modern society, they are becoming less popular and steel coasters are more prevalent.

a.        Research the differences in roller coaster materials and create a pro’s and con’s list for wood and steel materials.

b.       After doing research, write a 3 paragraph essay stating which material you believe is better to make a roller coaster out of and why. Keep in mind the following items:

i.   Cost of the materials to make the roller coaster

ii. Safety to customers

iii.                        Complexity of the design and ease of build

2.       After researching and understanding the six different types of simple machines, choose and describe in detail which simple machine you believe is the simple machine we couldn’t live without and is the most helpful/beneficial to daily activities. Be sure to include appropriate vocabulary and include your reasoning as to why the simple machine is the most important. Remember this your opinion and it must include factual information to support your reasoning!

3.       After researching and understanding the six different types of simple machines, choose one simple machine that most closely resembles a body part of the human body. In choosing the simple machine and the body part, choose the most closely related and argue your point as to why they are similar in function, ability, physical appearance, etc. Remember to use appropriate vocabulary and make your argument convincing with factual information.