

| <b>Chapit 3: Machin Senp</b>   | <b>Unit 3: Simple Machines</b>  |
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| <p><b>Lide Kle:</b></p> <p><b>3.1</b> Demontre ki jan enèji mekanik ka koze chanjman nan mouvman lè nou fè fòs oubyen lè nou sèvi ak machin senp.</p> <p><b>3.2</b> Obsève, dekri kouman fwotman afekte kantite chanjman ki fèt nan mouvman yon bagay.</p> <p><b>3.3</b> Obsève, dekri kouman pozisyon oswa direksyon mouvman yon bagay ka chanje lè ou pouse l oswa lè ou rale l.</p> <p><b>3.4</b> Obsève ki jan fòs pezan tè rale bagay nan direksyon sant latè.</p>  | <p><b>Key Ideas:</b></p> <p><b>3.1</b> Demonstrate how mechanical energy may cause change in motion through the application of force or the use of simple machines.</p> <p><b>3.2</b> Observe and describe how the amount of change in the motion of an object is affected by friction.</p> <p><b>3.3</b> Observe and describe how the position or direction of motion of an object can be changed by pushing or pulling.</p> <p><b>3.4</b> Observe how the force of gravity pulls objects toward the center of the Earth.</p>  |
| <b>Rezime Chapit la</b>  | <b>Unit Overview</b>  |
| <p>Ak ki kalite machin nou sèvi? Nou ka panse yon tay kreyon, yon bisiklèt oswa yon mato pa on machin, men yo se machin. Yon machin se nenpòt zouti ki rann on travay pi fasil.</p> <p>Lè nou monte on bisiklèt, misk ki nan janm nou bay enèji ki pèmèt nou fè bisiklèt la ale byen vit. Machin senp ki nan bisiklèt la pèmèt nou fè travay la pandan n ap sèvi ak mwens enèji.</p> <p>Gen machin senp toupatou: nan lekòl yo, nan kay la, ak nan kominote an. Yo fè travay yo pi fasil lè yo chanje entansite on fòs, direksyon li, oswa vitès fòs la.</p> | <p>What kinds of machine do we use? We may not think of a pencil sharpener, a bike, or a hammer as a machine, but they are. A machine is any tool that makes work easier to do.</p> <p>When we ride a bike, the muscles in the rider’s legs provide the energy to move the bike quickly. The simple machines that make up the bike let the rider do the most work while using the least energy.</p> <p>Simple machines are all around us: in school, at home, and in the community. They make work easier by changing the strength, direction, or speed of a force.</p> |

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| <p><b>Lide kle 3.1</b><br/>Demontre ki jan enèji mekanik ka koze chanjman nan mouvman lè nou fè fòs, oubyen lè nou sèvi ak yon machin senp.</p>  | <p><b>Key Idea 3.1</b><br/>Demonstrate how mechanical energy may cause change in motion through the application of force or the use of simple machines.</p>   |
| <p><b>Tèm Syantifik:</b><br/>1. fòs 2. travay 3. plan encline<br/>4. ranp 5. kwen 6. vis 7. levye 8. pwen dapui<br/>9. wòd 10. wou 11. aks 12. pouli</p>   | <p><b>Scientific Terms:</b><br/>1. force 2. work 3. inclined plane<br/>4. ramp 5. wedge 6. screw<br/>7. lever 8. fulcrum 9. rod<br/>10. wheel 11. axel 12. pulley</p>   |
| <p><b>Enfòmasyon:</b><br/>Zouti ki gen yon sèl pyès oswa de pyès se yon machin senp. Machin senp sèvi ak enèji mekanik pou chanje entansite, direksyon, oswa vitès yon fòs.<br/><b>Travay</b> tankou soulve, koupe, fouye, sere ak deplase yon bagay pi fasil lè nou utilize yon machin senp.</p> <p><b>Plan Encline:</b><br/>Yon planch ki gen sifas lis se yon plan. Lè yon planch oswa on sifas encline li ede nou deplase on bagay de yon distans a on lòt. Yon ranp se yon plan encline. Li pi fasil pou deplase yon bwat lou si nou glise l desann oswa monte li sou yon ranp.</p> <div data-bbox="360 1348 592 1545" data-label="Image"> </div> <p><b>Kwen</b><br/>Lè ou sèvi ak rebò yon planch ki encline pou separe on bagay, plan encline a tounen on goyin</p> | <p><b>Content:</b><br/>Tools with only one or two parts are known as simple machines. Simple machines use mechanical energy to change the strength, direction, or speed of a <b>force</b>. <b>Work</b>, such as lifting, cutting, prying, tightening, and moving objects, is easier when we use simple machines.</p> <p><b>Inclined Plane</b><br/>A smooth board is a plane. When the board, or plane, is slanted, it can help us move objects across distances. A ramp is a common inclined plane. Moving a heavy box is easier if we slide the box up or down a ramp.</p> <p><b>Wedge</b><br/>When you use the pointed edges of an inclined plane to push things apart, the inclined plane is a</p> |

ki sèvi pou fann yon moso bwa, se on kwen. Yon hach, yon klou, yon kouto tout se kwen

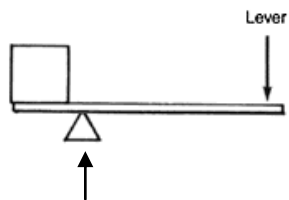
**Vis**

Yon vis se on machin senp ki kenbe bagay ansamn. Anpil kouvèti bokal gen yon gwo vis plat pou kenbe kouvèti a. Moun sèvi ak vis tou pou kenbe bwa oswa moso metal ansanm. Yon vis se on plan encline ki vlope toutotou yon tij. Tank ou vire yon vis se tank li ede kenbe bagay yo ansanm.



**Levyè**

Se yon zouti ki desere yon bagay oswa ki ede ou souleve li ak yon mouvman tankou ou ap leve bra ou, se yon levyè. Si nou sèvi ak yon tounvis pou nou louvri kouvèti yon mamit penti nou mete pwent tounvis la anba kouvèti a. Konsa rebò kouvèti mamit la sèvi kòm **pwent dapui** pou kenbe tounvis la anplas. Ansuit nou pouse lòt bout tounvis la desann. Pwen dapui a chanje direksyon fòs la e sa lakòz lòt pwent tounvis la pouse kouvèti a monte. Yon pèl oswa yon baskil nan on pak se lòt egzan levyè.



Fulcrum – pwent dapui

**Wou ak Aks**

Yon lòt kalite machin senp se wou avèk aks. Wou a vire aks la, sa lakòz mouvman. Bourèt se yon

wedge. A chisel, when used to split a piece of wood, is a wedge. An axe, a nail, and knife are wedges, too.

**Screw**

A screw is a simple machine that holds things together. Many jar lids have a large, flat screw that holds the lid to the jar. People also use screws to hold wood or metal pieces together. A screw is really an inclined plane wrapped around a rod. Every turn of a screw helps hold things together.

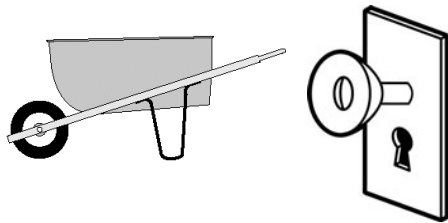
**Lever**

A tool that pries something loose or that lifts with an arm-like motion is a lever. If we use a screwdriver to pry open the lid of a paint can, we place one end of the screwdriver under the lid of the can. The screwdriver is held up by the edge of the can —or **fulcrum**. Then, we push down on the other end of the screwdriver. The fulcrum changes the direction of the force, causing the other end of the screwdriver to push up on the lid. A shovel or a playground seesaw can be another example of lever.

**Wheel and Axle**

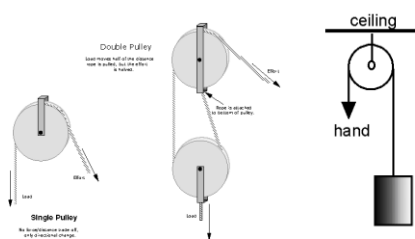
Another kind of simple machine is the wheel and axle. The wheel turns the axle, which causes

bon egzanp pou wou ak aks. Wou a vire toutotou aks la, konsa brouèt la deplase. Yon lòt egzanp se manch on pòt ki se on wou tou. Aks la se yon tij ki pase atravè pòt la epi li konekte nan manch pòt la. Lè nou vire yon manch pòt, nou vire aks la. Lè sa a aks la deplase yon lòt pati nan manch pòt la e sa fè pòt la ouvri.



**Pouli**

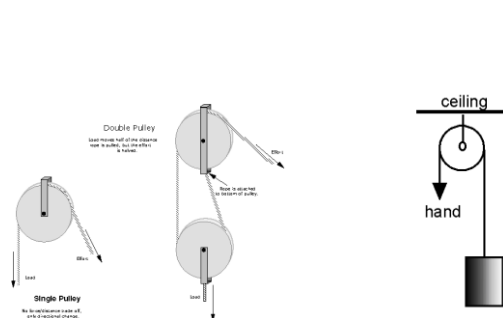
Yon wou ki fè on kòd vire ale tounen se yon pouli. Nan yon pouli kòd la vlope toutotou wou a, konsa lè wou a vire kòd la deplase. Ou ka sèvi ak kòd pou souleve on bagay, oswa pou desann li. Egzanp, yo sèvi ak on pouli pou desann on drapo ki nan on ma drapo. Pafwa tou, yo konn sèvi ak plizyè pouli pou deplase bagay. Moun sèvi ak plizyè pouli ansann pou yo deplase bagay ki lou tankou bato, pyano, ak kòfrefò. Plis kòd nou sèvi pou soutni chay la long, plis entansite fòs k ap souleve chay la ogmante.



movement. An example of the wheel and axle is the wheelbarrow. The wheel below rotates on the axle and the wheelbarrow moves. A doorknob is another example. The knob is the wheel. The axle is the rod that goes through the door. The axle connects the two knobs. When we turn a doorknob, we turn the axle. The axle then moves another part within the doorknob that makes the door open.

**Pulley**

The wheel can also rotate a rope. This is a pulley. In a pulley, a rope wraps around a wheel. As the wheel rotates, the rope will move. The rope can be used to raise and lower objects. For example, a flag on a flagpole is raised and lowered by a pulley. Sometimes a number of pulleys are used to move objects. People use groups of pulleys to move heavy loads, such as boats, pianos, and safes. The more ropes used to hold the load, the stronger the force acting on the load.



| <b>Revizyon</b>   | <b>Review:</b>  |
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| <ol style="list-style-type: none"><li>1. Ki sa on machin senp ye?</li><li>2. Ki machin senp ki gen yon pwen dapui?</li><li>3. Ki jan moun sèvi ak pouli pou fè travay?</li><li>4. Lè ou soulve on boul ak pla men ou, ou sèvi ak bra ou kòm levye. Ki kote pwen dapui a ye?</li><li>5. Bay twa machin senp ki baze sou on plan encline?</li></ol> | <ol style="list-style-type: none"><li>1. What are simple machines?</li><li>2. Which simple machine has a fulcrum?</li><li>3. How do people use pulleys to do work?</li><li>4. When you lift a ball in the palm of your hand, you use your arm as a lever. What is the fulcrum?</li><li>5. Which three simple machines are based on inclined planes?</li></ol> |

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| <p><b>Lide kle 3.2</b><br/>Obsève, dekri kouman fwotman afekte kantite chanjman ki fèt nan on bagay.</p>   | <p><b>Key Idea 3.2</b><br/>Observe and describe how the amount of change in the motion of an object is affected by friction.</p>  |
| <p><b>Tèm Syantifik</b><br/>1. fwotman 2. fòs-presyon 3. fwote 4. lis<br/>5. graj 6. sifas</p>   | <p><b>Scientific Terms:</b><br/>1. friction 2. force 3. rub 4. smooth<br/>5. rough 6. surface</p>   |
| <p><b>Enfòmasyon:</b><br/><b>Fwotman</b> se yon <b>fòs</b> ki ralanti oswa kanpe deplasman on bagay. <b>Fwotman</b> se sa ki pase lè de bagay fwote yon ak lòt. Fwotman ki fèt ant sifas <b>lis</b> mwens pase fwotman ki fèt ant <b>sifas graj</b>.</p> <p>Fwote yon moso papye aliminyòm sou on mòso bwa pa lakòz anpil friksyon. Lè ou fwote on papye sable sou on moso bwa sa lakòz plis friksyon. Fwote papye sable a alevini sou moso bwa a lakòz papye a ansanm ak bwa a vin cho lè ou manyen yo paske se de sifas graj ki fwote youn kont lòt. Fwotman an ralanti mouvman an epi li bay chalè. Wou ki nan on bourèt rann li pi fasil pou rale bourèt la paske nan on machin senp wou ak aks yo diminye fwotman ak kantite fòs ou ta bezwen pou deplase on bourèt.</p> <p>Fwotman ede ou ak bagay ou fè chak jou tankou fwotman ki fèt ant soulye ou ak twotwa yo ede ou mache. Si pa t gen fwotman ou tap glise epi ou tap tonbe. Fwotman pèmèt nou kanpe lè n ap mache epitou li anpeche kawoutchou machin glise sou wout yo.</p> | <p><b>Content:</b><br/><b>Friction</b> is a <b>force</b> that slows down or stops moving objects. When an object <b>rubs</b> against another object, friction results. The friction between <b>smooth</b> surfaces is less than the friction between <b>rough surfaces</b>.</p> <p>Rubbing a piece of foil over wood does not cause much friction. Rubbing a piece of sandpaper over wood does cause friction. When you rub a piece of sandpaper back and forth across a piece of wood, the sandpaper and wood will feel warm when you touch them. The surfaces rub against each other; the roughness of the surfaces slows the movement and produce heat. The wheels on your wheelbarrow make it easier to pull. That’s because the simple machine of wheels and axles reduces friction and reduces the amount of force needed to move the wheelbarrow.</p> <p>Friction helps you do things every day. The friction between your shoes and the sidewalk helps you walk. Without friction, you would slip and fall. Friction makes you stop. Friction helps keep tires from slipping on the road.</p> |
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| <p><b>Revizyon:</b></p> <ol style="list-style-type: none"> <li>1. Ki sa ki lakòz fwotman?</li> <li>2. Kouman fwotman chanje mouvman yon bagay?</li> <li>3. Ki jan ou ka diminye fwotman ant de bagay ka p fwote ansanm?</li> </ol>  | <p><b>Review:</b></p> <ol style="list-style-type: none"> <li>1. What causes friction?</li> <li>2. How does friction change an object’s motion?</li> <li>3. How can you reduce the friction between two objects rubbing together?</li> </ol>   |
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| <p><b>Lide Kle 3.3</b><br/>Obsève, dekri kouman pozisyon oswa direksyon mouvman on bagay ka chanje lè ou pouse l oswa rale l.</p>   | <p><b>Key Idea 3.3</b><br/>Observe and describe how the position or direction of motion of an object can be changed by pushing or pulling.</p>  |
| <p><b>Tèm Syantifik:</b><br/>1. pouse 2. rale</p>   | <p><b>Scientific Terms:</b><br/>1. push 2. pull</p>   |
| <p><b>Enfòmasyon:</b><br/>Imajine ou gen on kabwèt vid ou vle deplase on ti distans. Ou ka <b>pouse</b> kabwèt la oswa ou ka <b>rale</b> li. Kèlkilanswa, ou itilize fòs pou deplase kabwèt la. Fòs se lè nou pouse oswa rale yon bagay. On bagay tankou on kabwèt deplase sèlman lè ou pouse li oswa nou rale l.</p> <p>Pouse yon kabwèt monte pran plis fòs pase pouse kabwèt la desann. Ti mòn lan se tankou yon machin senp nou rele plan encline ki chanje mouvman bagay la. Anmenmtan, nou itilize plis fòs kont pezanntè ka p rale kabwèt la tounen.</p> | <p><b>Content:</b><br/>Imagine you have an empty wagon that you want to move a short distance. You might <b>push</b> the wagon or you might <b>pull</b> it. Either way, you would use force to move the wagon. A force is a push or a pull. An object, such as the wagon, starts to move only when something pushes it or pulls on it.</p> <p>Pushing a wagon uphill would take more force than pushing the wagon downhill. The hill acts like a simple machine called an inclined plane, which changes the motion of the object. At the same time, we have to use more force against the gravity that pulls the wagon back to Earth.</p> |
| <p><b>Revizyon:</b></p> <ol style="list-style-type: none"> <li>1. Ki sa k ap rive si ou pouse on bagay oswa ou rale l?</li> <li>2. Esplike sa k ap mande plis fòs: pouse on treno sou glas ak de moun oubyen ak yon sèl moun sou li.</li> </ol>   | <p><b>Review:</b></p> <ol style="list-style-type: none"> <li>1. What will happen if you push or pull a small object?</li> <li>2. Explain whether it will take more or less force to push a sled over ice with two persons than one person on it.</li> </ol>   |

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| <p><b>Lide Kle 3.4</b><br/>Obsève kouman fòs pezantè rale bagay nan direksyon sant latè?</p>  | <p><b>Key Idea 3.4</b><br/>Observe how the force of gravity pulls objects toward the center of the Earth.</p>   |
| <p><b>Tèm syantifik:</b><br/>1. pezantè 2. òbit</p>   | <p><b>Scientific Terms:</b><br/>1. gravity 2. orbit</p>   |
| <p><b>Enfòmasyon:</b><br/>Pou ki sa bagay nou voye anlè tounen desann? Repons la se <b>pezantè</b>. Pandan 17yèm syèk la, Isaac Newton mande pou ki sa lalin vire otou latè a. Li te mande tou pou ki sa pòm tonbe nan pye pòm yo. Newton te dekouvri fòs pezantè. Pezantè se yon fòs atraksyon ki gen ant diferan bagay. Li rale pòm lan nan direksyon sant latè epitou li kenbe lalin la nan <b>òbit</b> li otou latè a.</p> <p>Pezantè egziste sou lalin tou. Paske lalin pi piti pase latè, pezantè lalin lan mwens pase pezantè latè. Se poutèt sa, lalin lan pa tonbe sou latè tankou yon pòm. Si pa te gen pezantè, deplasman lalin lan ta dwe yon wout dwat nan direksyon opoze ak latè. Fòs atraksyon pezantè lalin ak fòs atraksyon pezantè latè lakòz mouvman lalin lan se on mouvman koube nan yon òbit otou latè.</p> <p>Pezantè travay nan gaz, likid, ak solid. Lè rete ozalantou latè akoz pezantè. Dlo lanmè pa vole nan lespas akoz pezantè. Wòch ak tè rete anplas sou latè akoz pezantè. Noumenm tou pezantè fè nou rete atè. Si nou vole anlè pezantè ap rale nou desann atè. Monte yon mòn sou bisiklèt mande plis fòs pase lè pou desann mòn lan paske pezantè rale w desann ansanm ak bisiklèt la. Si pa te gen pezantè, pa gen anyen ki tap atire gaz, likid ak solid nan sant latè. Yo tout ta pwobableman rete</p> | <p><b>Content:</b><br/>Why do things come back down if you throw them up in the air? The answer is <b>gravity</b>. In the 17<sup>th</sup> century, Isaac Newton wondered why the Moon orbits the Earth. He also wondered why apples fall from apple trees. What Newton discovered was the force called gravity. Gravity is a force of attraction between objects. It pulls apples toward the center of the Earth and it also keeps the Moon in <b>orbit</b> around the Earth.</p> <p>The Moon has gravity too. Because the Moon is smaller than the Earth, its gravity is less than Earth’s. Therefore, the Moon doesn’t fall to Earth like an apple. If there were no gravity, the motion of the Moon would be a straight path away from the Earth. The pull of gravity of both the Earth and the Moon causes the path of the Moon to curve in an orbit around Earth.</p> <p>Gravity works through gases, liquids, and solids. Air stays around the Earth because of gravity. Oceans do not fly off into space because of gravity. Rocks and soil stay on Earth because of gravity. You stay on Earth because of gravity too. If you jump up, the gravity will pull you down to the ground. Riding a bicycle uphill would take more force than riding downhill because the gravity keeps pulling you and your bicycle down. Without gravity, gases, liquids,</p> |



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| flote nan lè a.  | and solids would not be pulled to the center of Earth. They all would probably be floating in the air.   |
| <p><b>Revizyon:</b></p> <ol style="list-style-type: none"> <li>1. Ki sa ki pezantè?</li> <li>2. Ki diferans ki tap gen nan mouvman lalin si pa te gen pezantè?</li> <li>3. Ki sa ki tap rive si pa te gen okenn pezantè sou latè?</li> </ol> | <p><b>Review:</b></p> <ol style="list-style-type: none"> <li>1. What is gravity?</li> <li>2. How would the motion of the Moon be different if there were no gravity?</li> <li>3. What would happen if there were no gravity on Earth?</li> </ol> |

| <b>Repons</b>  | <b>Answer Key</b>  |
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| <p><b>3.1</b></p> <ol style="list-style-type: none"> <li>1. Machin senp yo se zouti ak kèk pyès mobil oswa san pyès mobil ki rann travay pi fasil.</li> <li>2. Levye gen yon pwen dapui.</li> <li>3. Moun itilize pouli pou rale bagay monte, desann oswa sou kote.</li> <li>4. Koud nou se on pwen dapui.</li> <li>5. Kwen, plan encline, ak vis se twa machin senp ki baze sou on plan encline.</li> </ol> | <p><b>3.1</b></p> <ol style="list-style-type: none"> <li>1. Simple machines are tools with few or no moving parts that make work easier.</li> <li>2. The lever has a fulcrum.</li> <li>3. People use pulleys to move objects up, down or sideways.</li> <li>4. The elbow is the fulcrum.</li> <li>5. Wedges, inclined planes, and screws are three simple machines based on the inclined plane.</li> </ol>                   |
| <p><b>3.2</b></p> <ol style="list-style-type: none"> <li>1. Lè ou fwote de bagay ansanm, sa lakòz fwotman.</li> <li>2. Sifas ki pa lis ralanti mouvman on bagay.</li> <li>3. Ajoute wou nan on bagay rann li pi fasil pou rale l paske aks ak wou on machin senp diminye kantite fwotman ak kantite fòs kit ta nesèsè pou deplase yon bagay.</li> </ol>  | <p><b>3.2</b></p> <ol style="list-style-type: none"> <li>1. Rubbing two objects against one another causes friction.</li> <li>2. The roughness of the surfaces slows down the movement of the object.</li> <li>3. Add wheels to the object. Wheels will make it easier to pull. That’s because the simple machine of wheels and axles reduces friction and reduces the amount of force needed to move the object.</li> </ol> |
| <p><b>3.3</b></p> <ol style="list-style-type: none"> <li>1. Bagay la ap deplase.</li> <li>2. Ajoute yon lòt moun sou on treno fè li peze plis. Ou ap bezwen plis fòs pou ou deplase l paske li pi lou.</li> </ol>  | <p><b>3.3</b></p> <ol style="list-style-type: none"> <li>1. The object will move.</li> <li>2. Adding another person to the sled makes it weigh more. It will take more force to move a heavier object.</li> </ol>  |
| <p><b>3.4</b></p> <ol style="list-style-type: none"> <li>1. Pezantè se on fòs atraksyon ant de bagay.</li> <li>2. Wout li ta dwe yon liy dwat nan direksyon opoze ak latè olye yon trajektwa koub toutotou latè.</li> <li>3. Tout bagay tap flote anlè.</li> </ol>   | <p><b>3.4</b></p> <ol style="list-style-type: none"> <li>1. Gravity is the force of attraction between two objects.</li> <li>2. Its path would be a straight line away from the Earth instead of a curved path around Earth.</li> <li>3. Everything would float up in the air.</li> </ol>  |