

Acknowledgements – Lesson Intro

Graphs, diagrams, illustrations, images in this course, unless otherwise specified, are ILC created, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Intro Video, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Ergonomic: Wrong and correct sitting pose © iStock.com/bestsale.

Old books and magazines with alarm clock © iStock.com/Garsya.

Acknowledgements – Lesson 1

Sea waves © iStock.com/Kozyreva.

Old oscilloscope screen with multiple sinus waves, Lebazele/iStock/Getty Images

Sea waves © iStock.com/borchee.

Abstract particle waves, piranka/iStock/Getty Images

Splashing ocean waves © iStock.com/MRaust.

Wave on a String, University of Colorado, URL: https://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html, Accessed 14/05/2018, PhET Interactive Simulations, University of Colorado Boulder, <https://phet.colorado.edu> - Granted under Creative Commons Attribution 4.0 Generic (CC BY 4.0) License: <https://creativecommons.org/licenses/by/4.0/>.

Seamless waves, Ani_Ka/DigitalVision Vectors/Getty Images

Sound waves oscillating glow light, natrot/iStock/Getty Images

Woman with battle ropes in gym, aleksejplatonov/Creatas Video+/Getty Images

Transverse waves, Tycho Sleator, New York University, URL: https://physics.nyu.edu/~ts2/Animation/gauss_discrete_trans.m4v, Published 06/10/2007, Accessed 14/05/2018.

Longitudinal wave, Tycho Sleator, New York University, URL: http://www.physics.nyu.edu/~ts2/Animation/Trans_Long_Periodic_Waves.html, Published 06/10/2007, Accessed 14/05/2018.

Wave on a String, University of Colorado, URL: https://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html, Accessed 14/05/2018, PhET Interactive Simulations, University of Colorado Boulder, <https://phet.colorado.edu> - Granted under Creative Commons Attribution 4.0 Generic (CC BY 4.0) License: <https://creativecommons.org/licenses/by/4.0/>.

Periodic motion (Little girl swinging), PhotoMovieRu/Creatas Video+/Getty Images

Earth from space, alexsl/iStock/Getty Images

Following are Summaries from Two Chemistry Education Web Sites Concerning Significant Figure Rules, Diamond Bar High School, URL: <http://tournas.rice.edu/website/documents/SignificantFigureRules1.pdf>, Accessed 14/05/2018.

Girl swinging on a playground swing, © lunamarina/Adobe Stock.

Abstract concentric wave in turquoise water, photon64/iStock/Getty Images

Wave on a String, PHET Interactive Simulations, University of Colorado Boulder, URL: https://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html, Granted under Attribution 4.0 International (CC BY 4.0) License: <https://creativecommons.org/licenses/by/4.0/>.

Wave on a String, University of Colorado, URL: https://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html, PhET Interactive Simulations, University of Colorado Boulder, <https://phet.colorado.edu> - Granted under Creative Commons Attribution 4.0 Generic (CC BY 4.0) License: <https://creativecommons.org/licenses/by/4.0/>.

Wave on a String, University of Colorado, URL: https://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html, PhET Interactive Simulations, University of Colorado Boulder, <https://phet.colorado.edu> - Granted under Creative Commons Attribution 4.0 Generic (CC BY 4.0) License: <https://creativecommons.org/licenses/by/4.0/>.

Fixed end wave, SMU Physics Demos, Saint Mary's University, Halifax, NS, URL: <https://youtu.be/LTWHxZ6Jvjs>, Published 20/05/2010, Accessed 14/05/2018.

Free end wave, SMU Physics Demos, Saint Mary's University, URL: <https://youtu.be/aVCqq5AkePI>, Published 20/05/2010, Accessed 14/05/2018.

Man in a studio wearing headphones, puhimec/iStock/Getty Images

Talk through a String Telephone, Katherine Harmon, Scientific American, URL: <https://www.scientificamerican.com/article/talk-through-a-string-telephone-bring-science-home/>, Published 06/05/2011, Accessed 04/07/2018.

Tuning fork in water, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

How hearing works, The Hearing Foundation of Canada, URL: <http://www.hearingfoundation.ca/how-hearing-works/>, Accessed 14/05/2018.

Courtesy of Saskatchewan Education.

Tuning fork © iStock.com/Smileus.

Tuning Fork making a sound wave in air, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Tuning Fork making a rarefaction in air, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Tuning Fork making a compression in air, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Typical tuning fork, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Longitudinal wave, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Hand holding silver tuning fork, Smileus/iStock/Getty Images

Lightnings over city skyscrapers during thunderstorm © iStock.com/Maxiphoto.

Speed of Wave (Pulse demonstration), Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Doppler Effect, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Stationary source; Source moving to the right, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Ambulance sound, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Pregnant woman having ultrasound © iStock.com/monkeybusiness.

Theatre auditorium © iStock.com/gnagel.

Dolphins jumping © iStock.com/lg0rZh.

Use of echolocation by a dolphin, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Jacob Hamblin Arch © iStock.com/kojihirano.

Closeup fragment of ships navigation radar screen © iStock.com/Eugene Sergeev.

Sonar, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Banging Night, Ringing Ears, Action on Hearing Loss , URL: <https://www.instagram.com/p/Be8LAXCAbw8/?hl=en>, Constant Ringing, Action on Hearing Loss , URL: <https://www.instagram.com/p/Be0pQ-MAzuE/?hl=en>,

Wave, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Wave Pulse Interference and Superposition, ukukuku, GeoGebra Group, URL: <https://www.geogebra.org/m/dJrTcxYd>,

Superposition, Tycho Sleator, New York University, URL: <http://www.physics.nyu.edu/~ts2/Animation/Superposition.html>, Published 06/10/2007, Accessed 14/05/2018.

Constructive Interference Crests, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Constructive Interference Troughs, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Superposition 2, Tycho Sleator, New York University, URL: <http://www.physics.nyu.edu/~ts2/Animation/Superposition.html>, Published 06/10/2007, Accessed 14/05/2018.

Superposition 3, Tycho Sleator, New York University, URL: <http://www.physics.nyu.edu/~ts2/Animation/Superposition.html>, Published 06/10/2007, Accessed 14/05/2018.

Destructive Interference, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Constructive and Destructive Interference, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Displacement, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Displacement Solution, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Superposition, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Superposition Solution, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Tuning Forks, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Wave on a String, University of Colorado, URL: https://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html, PhET Interactive Simulations, University of Colorado Boulder, <https://phet.colorado.edu> - Granted under Creative Commons Attribution 4.0 Generic (CC BY 4.0) License: <https://creativecommons.org/licenses/by/4.0/>.

Blue Wave Red Wave, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Standing Waves, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Standing Waves, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

1st and 6th Nodes, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

“Sonic boom, PHAN(AW) Jonathan D. Chandler, U.S. Navy, URL: https://commons.wikimedia.org/wiki/File:Sonic_boom_050817-N-3488C-151.jpg, Published 25/02/2006, Accessed 24/08/2017. “

Supersonic Jet Noise, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

The Sound Barrier, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Periodic (transverse 1) Wave, Tycho Sleator, New York University, URL: http://www.physics.nyu.edu/~ts2/Animation/Trans_Long_Periodic_Waves.html, Published 06/10/2007, Accessed 14/05/2018.

Periodic (transverse 2) Wave, Tycho Sleator, New York University, URL: http://www.physics.nyu.edu/~ts2/Animation/Trans_Long_Periodic_Waves.html, Published 06/10/2007, Accessed 14/05/2018.

Musical Concept © iStock.com/XtockImages.

Tube, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Father pushing son on swing © iStock.com/KellyBoreson.

Four Pendulums, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Courtesy of TSG@MIT Physics.

Shattering Wine Glass, University of Salford, URL: <http://www.acoustics.salford.ac.uk/feschools/waves/wine3video.htm>, Accessed 24/08/2017.

Galloping Gertie: The Collapse of the Tacoma Narrows Bridge , Minodora4, Koyo Kim and Raluca Ifrim, URL: <https://www.youtube.com/watch?v=ASd0t3n8Bnc>, Published 39089, Accessed 43018.

Nodes and Antinodes, The University of Tennessee Department of Physics and Astronomy, URL: <http://electron6.phys.utk.edu/phys250/modules/module%201/standing-waves.htm>, Accessed 24/08/2017.

Rows of violins © iStock.com/Kativ.

Standing Wave Loops, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Standing Wave Loops, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Guitarist on stage for background, soft and blur concept © iStock.com/ipopba.

Tuning forks on resonance boxes, Copyright © 2018 The Ontario Educational

Communications Authority. All rights reserved.

Closed Air Column, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Standing Waves - First Resonant Length, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Standing Waves - Second Resonant Length, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Standing Waves - Third Resonant Length, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Standing Waves - First Resonant Length, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Standing Waves - Second Resonant Length, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Standing Waves - Third Resonant Length, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Wind musical instruments © iStock.com/Shedevrator.

Rows of violins © iStock.com/Kativ.

Speaking icon on a white background © iStock.com/crispyicon.

Silver Chrome Snare Drum with Sticks, Instrument on White Background © iStock.com/YinYang.

The Qilaut, Faculty of Music University of Montreal, CHIN, URL: <http://www.virtualmuseum.ca/edu/ViewLoitDa>

How Its Made - 960 Native Healing Drums, URL: <https://www.youtube.com/watch?v=YyIYYgRgTkA>, Accessed 22/05/2018.

<http://native-drums.ca/en/>.

Acknowledgements – Lesson 2

2016 Olympics in Rio: Women's 100m Freestyle Final, International Olympic Committee (IOC), URL: https://www.youtube.com/watch?v=GgK6u_CkTPs, Published 21/08/2016, Accessed 20/06/2018, All Olympic Footage available in this production is copyright of and reproduced only with the consent of the International Olympic Committee.

Hockey game, Adam Klepsteen, Freeimages.com, URL: <https://www.freeimages.com/photo/hockey-1-1251091>,

Austrian Airlines in sunset at Schwechat airport © iStock.com/spyderskidoo.

Four lane controlled-access highway in Poland, monticello/iStock/Getty Images

People riding a rollercoaster in an amusement park, bukharova/iStock/Getty Images

Man playing ice hockey © iStock.com/simonkr.

Speed VS Time - Positive Slope, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Speed VS Time - Positive Slope, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Speed VS Time - Horizontal Line, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Distance VS Time, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Non-Uniform Motion, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Curved line, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Positive Slope, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Horizontal Line, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Winding Road on a White Isolated Background with pin pointer, zmierkavabata/iStock/Getty Images

Streetscape in Tara's Hometown, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Position VS Time Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Position VS Time Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Position VS Time for a Remote-controlled car, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Moving sidewalk, LeafenLin/iStock/Getty Images

Distance VS Time for Trip Across Confederation Bridge, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Position VS Time Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Graphing Motion Problem Level 1, Frank McCulley, The Physics Aviary, URL: <http://www.thephysicsaviary.com/Physics/APPrograms/ConstantVelocityGraph/index.html>,

Position VS Time Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Position VS Time Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Position VS Time for Delivery of Cabbages, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Position VS Time for Delivery of Cabbages, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Penny Oleksiak Race Report, RaceTek Canadian Sport Initiative, Canadian Sports Institute, Accessed 12/11/2018.

Race Report, RaceTek Canadian Sport Initiative, Canadian Sports Institute, Accessed 12/11/2018.

Race Report, RaceTek Canadian Sport Initiative, Canadian Sports Institute, Accessed 12/11/2018.

Position VS Time, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Position VS time for a Walk Through the Neighbourhood, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Increasing Velocity Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Constant Velocity Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Velocity VS Time for a Rail Car, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Velocity VS Time for a Rail Car, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Area of a Triangle, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Velocity VS Time for a Bag of Groceries, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Velocity VS Time for a Bag of Groceries - Area 1 and 2, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Velocity VS Time for a Train, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Velocity VS Time for a Train - Area 1 and 2, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

A) Velocity VS Time, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

B) Velocity VS Time, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

C) Velocity VS Time, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Caution Bat eared fox! Traffic sign in Botswana, Africa, ClaraNila/iStock/Getty Images

Little boy playing football, baona/iStock/Getty Images

SWEET LAUGHTER, RubyRain/iStock/Getty Images

Young Woman Softball Player Pitcher Pitching Ball, EHStock/iStockphoto/Getty Images

Lady Golfer at TPC in Scottsdale © iStock.com/davepeetersphoto.

Man Throwing Dart © iStock.com/Baxternator.

Newton © iStock.com/erhui1979.

Galileo's Gravity Experiment, Lanny Lin , URL: <http://lannyland.blogspot.ca/2012/12/10-famous-thought-experiments-that-just.html>, Published 020/12/2012, Accessed 25/08/2017.

Apollo 15 Hammer-Feather Drop, Dr. David R. Williams, NASA, URL: https://nssdc.gsfc.nasa.gov/planetary/lunar/apollo_15_feather_drop.html, Published 08/1971, Accessed 14/05/2018.

Tennis Toss for Serve, Bill Oxford/iStock/Getty Images

Projectile motion, Bitesize, British Broadcasting Corporation, URL: http://www.bbc.co.uk/bitesize/intermediate2/physics/mechanics_and_heat/projectiles/revision/1/, Published 2014, Accessed 25/08/2017.

Shoot-n-Drop, Harvard Natural Sciences Lecture Demonstrations, Harvard University, URL: <https://www.youtube.com/watch?v=zMF4CD7i3hg>, "Shoot-n-Drop" footage courtesy Harvard Natural Sciences Lecture Demonstrations.

Ball Motion, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Velocity Vector for Ball B, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Ball Motion, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Velocity Vector for Ball B, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Female Striker, sturti/iStock/Getty Images

Soccer Ball Trajectory, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

A man tosses a coin into a fountain, tanyss/iStock/Getty Images

Throwing a stone. Beach background, Angel Gruber/iStock/Getty Images

Golfer swing © iStock.com/mkitina4.

Distance VS Time for a Bag of Carrots, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Position VS Time for Mouse, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

A) Velocity VS Time, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

B) Velocity VS Time, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

C) Velocity VS Time, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Man pushing door open, Ryan McVay/DigitalVision/Getty Images

Basketball, Jupiterimages/liquidlibrary /Getty Images

Scales © iStock.com/INchendio.

Spring Scale, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

The birdhouse, paleka19/iStock/Getty Images

The birdhouse, paleka19/iStock/Getty Images

Free Body Diagram, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Free Body Diagram, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Cancelled: Net Force Game Simple, Frank McCulley, The Physics Aviary, URL: <http://www.thephysicsaviary.com/Physics/Programs/Games/NetForceSimpleGame/index.html>,

Engraving of astronomer Galileo Galilei from 1870 © iStock.com/Grafissimo.

Silhouettes of people in a passenger bus, daniilphotos/iStock/Getty Images

Inertia © iStock.com/ttsz.

Balance coin on playing card, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Embed: Tablecloth Demonstration, The Physics Classroom, Tom Henderson, URL: <https://www.youtube.com/watch?v=JqZOUgACPF0>,

Egg Drop Inertia Challenge, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Postage stamp Germany 1993 Sir Isaac Newton 1642-1727, scientist © iStock.com/popovaphoto.

Trinity College and Newtons Apple Tree, Cambridge © iStock.com/Empato.

Gibraltar Isaac Newton postage stamp © iStock.com/PictureLake.

Light dispersion illustration © iStock.com/setixela.

Isaac Newton's Philosophiæ Naturalis Principia Mathematica published 5 July 1687 © iStock.com/satori13.

British Coins Full Frame Background © iStock.com/robynmac.

Issac Newton Quote, Issac Newton, URL: <https://www.brainyquote.com/quotes/quotes/i/isaacnewto135885.html>,

About Those Pads © iStock.com/jimbycat.

Chris Hadfield © Canadian Space Agency, 2013.

Upside Down & Inside Out, OK GO, BMG Rights Management, URL: <https://youtu.be/LWGJA9i18Co>, Accessed 06/09/2018.

Walking a trail © iStock.com/lmsvail99.

Filled shopping cart rushes down aisle showing exaggerated motion blur © iStock.com/RapidEye.

Soccer Player Kicking Ball © iStock.com/avid_creative.

Ice hockey background © iStock.com/BradCalkins.

Acceleration Calculation, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Baby First steps © iStock.com/lessismoregraph.

Skateboarding Action and Reaction Force, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Adult and Child on Skates, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Adult Pulling Children in A Wagon, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Gravity Explained, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Earth's Radius, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Why Do Astronauts Float Around In Space?, Rhett Allain, Condé Nast, URL: <https://www.wired.com/2011/07/why-do-astronauts-float-around-in-space/>, Published 07/09/2011, Accessed 07/09/2018.

OK Go Shot Their Latest Music Video in Microgravity, Danny Lewis, Smithsonian Institution, URL: <https://www.smithsonianmag.com/smart-news/ok-go-shot-their-latest-music-video-microgravity-180958132/>, Published 12/02/2016, Accessed 07/09/2018.

15 Years of the International Space Station, Gary Daines, NASA, URL: <https://www.nasa.gov/content/infographic-15-years-of-the-international-space-station/#.Wqx28ZMbP-Y>, Accessed 07/09/2018.

Kids having fun in winter sliding on snow with sleds © iStock.com/Imgorthand.

Friction between surfaces, CaoHao, Wikipedia, URL: https://commons.wikimedia.org/wiki/File:Friction_between_surfaces.jpg, Published 11/11/2014, Accessed 07/09/2018.

Couple moving into new house, Rawpixel/iStock/Getty Images

Man's legs © iStock.com/eranicle.

Car on road over sunny day © iStock.com/LuckyBusiness.

Modern Kitchen © iStock.com/gerenme.

wellingtons standing on ice, nico_65/iStock/Getty Images

Normal synovial joint anatomy. Healthy joint detailed illustration, TefiM/iStock/Getty Images

Three Treatments for Osteoarthritis of the Knee, The Agency for Healthcare Research and Quality (AHRQ), Eisenberg Center at Oregon Health & Science University, URL: <https://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0008368/>, Published 08/04/2009, Accessed 20/09/2018.

Car tires on winter road, AGrigorjeva/iStock/Getty Images

Airboat at Sunset © iStock.com/pelicanKate.

Acknowledgements – Lesson 3

Sprint start in blurred motion, stefanschurr/iStock/Getty Images

Frequency and Hearing © iStock.com/CSA-Printstock.

Cooking, gvictoria/iStock/Getty Images

The silhouette of the evening electricity transmission pylon, zhengzaishuru/iStock/Getty Images

Solarium beauty treatment, Vesnaandjic/iStock/Getty Images

Man ski jumping, simonkr/iStock/Getty Images

Springs, rozdesign/iStock/Getty Images

Fireplace, Tsuji/iStock/Getty Images

Nuclear power station aerial view in countryside landscape during sunset, Gregory_DUBUS/iStock/Getty Images

Sprint start in blurred motion, stefanschurr/iStock/Getty Images

Frequency and Hearing © iStock.com/CSA-Printstock.

Cooking, gvictoria/iStock/Getty Images

The silhouette of the evening electricity transmission pylon, zhengzaishuru/iStock/Getty Images

“Tanning bed solarium, Ridofranz/iStock/Getty Images”

Man ski jumping, simonkr/iStock/Getty Images

Springs, rozdesign/iStock/Getty Images

Fireplace, Tsuji/iStock/Getty Images

Nuclear power station aerial view in countryside landscape during sunset, Gregory_DUBUS/iStock/Getty Images

Firework extravaganza, Lakes4life/iStock/Getty Images

Smaller Flashlight © iStock.com/gregdh.

Multiple home appliances © iStock.com/Bet_Noire .

Tired young woman holding a paper shopping bag, GMint/iStock/Getty Images

Businessman pushing concrete wall away, BsWei/iStock/Getty Images

Hard work for less money, Drazen_/iStock/Getty Images

Long plank support for concrete and armature, Drazen_/iStock/Getty Images

Lifting Safety, tap10/E+/Getty Images

Old woman in wheelchair and young caregiver next to lake, RapidEye/E+/Getty Images

No head Boy, digitalhallway/iStock/Getty Images

Playtime, NurjanI/iStock/Getty Images

Crane lifts a container with cargo, Trifonenko/iStock/Getty Images

Ready for vacation, stock_colors/iStock/Getty Images

Businesswoman entering elevator, zoranm/iStock/Getty Images

Hair Dryer © iStock.com/Andyd.

Aquarium © iStock.com/Zadvinskii.

How Does a Heat Pump Work?, ttsz/iStock/Getty Images

EnerGuide Label, Natural Resources Canada, Government of Canada, URL: <https://www.nrcan.gc.ca/energy/products/for-participants/13068>, Published 43016, Accessed 29/08/2017.

EnerGuide Label, Natural Resources Canada, Government of Canada, URL: <https://www.nrcan.gc.ca/energy/products/energuide/label/13609>, Published 21/09/2018, Accessed 24/09/2018.

Lyndia Edwards Tweet, Lyndia Edwards, URL: <https://twitter.com/LyndaE222/status/957288494136569856> ,

The Salvation Army Tweet, @TSACentreofHope, The Salvation Army, URL: <https://twitter.com/tsacentreofhope/status/933051270318891008> ,

HealthRanger Tweet, HealthRanger, URL: <https://twitter.com/HealthRanger/status/874024787605114880>,

Christian Ramos Tweet, Christian Ramos, URL: <https://twitter.com/ChristianRam0s/status/859050921904533504>,

Robert M. Cutler Tweet, Robert M. Cutler, URL: <https://twitter.com/RobertMCutler/status/837401135514177536> ,

Mitzie Hunter Tweet, Mitzie Hunter , URL: <https://twitter.com/MitzieHunter/status/789587078317244416> ,

Ontario Energy Tweet, Ontario Energy , URL: <https://twitter.com/ONenergy/status/615852290423926784> ,

Design a Rollercoaster, Annenberg Foundation, URL: <https://www.learner.org/exhibits/parkphysics/coaster/>, Published ca. 2016, Accessed 24/09/2018.

Thomas Alva Edison, three-quarter length portrait, seated, facing front, Louis Bachrach, Library of Congress, URL: https://en.wikipedia.org/wiki/Thomas_Edison#/media/File:Thomas_Edison2.jpg, Published ca. 1922, Accessed 24/09/2018.

The Sun, alexandarilich/iStock/Getty Images

Clean energy concept The bulb is connected to a clutch of ground with a windmill and a solar battery 3d ernder, NosUA/iStock/Getty Images

Roller Coaster ride on tracks up high with blue sky, GomezDavid/iStock/Getty Images

Male shot putter, IPGGutenbergUKLtd/iStock/Getty Images

Children riding a roller coaster © iStock.com/kali9.

FALSE

Halfpipe, ZargonDesign/iStock/Getty Images

yellow hairdryer on white background, chert61/iStock/Getty Images

Stainless Toaster with Toast, ImageMediaGroup/iStock/Getty Images

Energy 14 Infographic Isometric, aurielaki/iStock/Getty Images

Air pollution. Factory or power plant smoke. Smoking factory concept, Photoplotnikov/iStock/Getty Images

Renewable Energy Sources- Infographic, mervin07/iStock/Getty Images

Blue lake amid mountain range and dramatic sky, fbxx/iStock/Getty Images

The three fundamental states of matter., ttsz/iStock/Getty Images

The three fundamental states of matter., ttsz/iStock/Getty Images

The three fundamental states of matter., ttsz/iStock/Getty Images

Convection current © iStock.com/blueringmedia.

Convection. Land Breeze and Sea Breeze © iStock.com/blueringmedia.

Solar energy! Blazing noonday sun in clear sky © iStock.com/RapidEye.

Casting cast iron © iStock.com/Westersoe.

Thermovision home image © iStock.com/ivansmuk.

Ice cold hands © iStock.com/Maridav.

Domestic Energy Efficiency By Reducing, hk-phy.org, URL: http://www.hk-phy.org/energy/domestic/heat_phy/images/conductors.jpg, Accessed 24/09/2018.

Lake Matheson, New Zealand, Puripatl/iStock/Getty Images

Fruit and leaves of orange tree covered by snow, AlonsoAguilar/iStock/Getty Images

Vacuum flask or Dewar flask, ttsz/iStock/Getty Images

Geothermal heat pump underfloorheating diagram, aurielaki/iStock/Getty Images

Nuclear Power - How it Works, OPGvideos, Ontario Power Generation, URL: <https://www.youtube.com/watch?v=v6mSw8Ddlml>, Accessed 29/08/2018.

How Does a Nuclear Power Plant Work?, Ontario Power Generation, URL: https://drive.google.com/file/d/10h-OK8RTyuGheVFMkjm_9JZwgrJAUOw2/view,

Nuclear Power Station in Germany © iStock.com/querbeet.

Danger Ionizing Radiation Sign © iStock.com/Gwengoat.

Mapped: The world's nuclear power plants, Rosamund Pearce and Simon Evans, Carbon Brief, URL: <http://googlemapsmania.blogspot.ca/2016/03/mapping-worlds-nuclear-power-plants.html>, Published 14/03/2016, Accessed 29/08/2017.

Hydrogen Isotopes, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Potassium material sign © iStock.com/nmcandre.

Atomic Nuclei and the Strong Force, British Broadcasting Corporation, URL: <http://news.bbc.co.uk/2/hi/science/nature/643791.stm>, Published 15/2/2000, Accessed 29/08/2017.

Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Radioactive Decay, GeoGebra, URL: https://dcc.ilc.org/ses4u/11/radioactive_decay/index.html,

Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Harold Johns, University Of Toronto - Faculty Of Medicine, URL: <http://www.radonc.utoronto.ca/harold-johns>, Accessed 29/08/2017.

Doctor and patient using digital tablet in hospital © iStock.com/Nikada.

X-Ray Lead Apron, Z & Z Medical, URL: <https://www.zzmedical.com/klingskuver-dental-x-ray-lead-apron-adult.html>, Accessed 29/08/2017.

Graph, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Nuclear Fission © iStock.com/7activestudio.

Nuclear Fusion © iStock.com/cosinart.

Reaction of Tritium with Proton © iStock.com/generalfmv.

Explosion nuclear bomb in ocean © iStock.com/RomoloTavani.

Map Japan Fukushima Nuclear Disaster © iStock.com/FrankRamspott.

The General Effects Of Atomic Bomb On Hiroshima And Nagasaki, Department of Defense, United States Government, URL: <https://archive.org/details/gov.dod.dimoc.27308>, Published 1975, Accessed 29/08/2017, CC0 1.0 Universal.

Nuclear Power Plants in Canada, World Nuclear Association, URL: <http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/canada-nuclear-power.aspx>, Published 40493, Accessed 29/08/2017.

CANDU Schematic Diagram, Jeremy Whitlock, Canadian Nuclear FAQ, URL: http://www.nuclearfaq.ca/cnf_sectionA.htm, Published 2011, Accessed 29/08/2017.

Radiation Risk Sign © iStock.com/imaginima.

Multiple yellow barrels of nuclear waste © iStock.com/bkindler.

FAQs: The foods irradiated in Canada and the safety issues, CBC/Radio-Canada, URL: <http://www.cbc.ca/news/health/food-irradiation-faq-1.3608013>, Published 01/06/2016, Accessed 26/09/2018.

Rollercoaster © iStock.com/wetcake.

Carefree woman having fun while rappelling from a zip line during canopy tour in nature, skynesher/iStock/Getty Images

Waterfalls in summer, ooyoo/iStock/Getty Images

Acknowledgements – Lesson 4

Hosting PHET: Circuit Construction Kit, University of Colorado, URL: https://phet.colorado.edu/sims/html/circuit-construction-kit-dc-virtual-lab/latest/circuit-construction-kit-dc-virtual-lab_en.html, Accessed 14/05/2018, PhET Interactive Simulations, University of Colorado Boulder, <https://phet.colorado.edu> - Granted under Creative Commons Attribution 4.0 Generic (CC BY 4.0) License: <https://creativecommons.org/licenses/by/4.0/>.

Watching tv and using remote control, gpetric/iStock/Getty Images

Conventional Current, Mukesh Kumar, Electrical Market Plus, URL: <https://www.sciencebuddies.org/science-fair-projects/references/electricity-magnetism-electromagnetism-tutorial#currentelectricity>, Published 42248, Accessed 29/08/2017.

In the Dryer, trekandshoot/iStock/Getty Images

Amp meter © iStock.com/pack_zero.

Rechargeable NiMH batteries on charge © iStock.com/clubfoto.

Energy Passing Through Lightbulb, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Voltmeter measuring potential difference, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.

Rubbing Hands Together © iStock.com/pink_cotton_candy.

Electronic © iStock.com/MarcoMarchi.

Ohm's Law, Copyright © 2018 The Ontario Educational Communications Authority. All rights reserved.