Multiple Intelligences
Unit Plan Template
EDUC 522

<table>
<tr><td colspan="2">Unit Title: Simple Machines
Grade Level: 2nd</td><td colspan="2">Teacher: Jasmine Bobczynski</td></tr>
<tr><td colspan="2">Subject: Science, Math</td><td colspan="2">Time Frame: 2 weeks</td></tr>
<tr><td>Objective(s):

Students will be able to recognize simple machines and what they are used for. Students will also be able to define a lever and each of its components and create their own working lever to assist them in completing a simple task. Finally students will be able to collect and organize data in graph form and reflect upon their own learning in an online log.</td><td>Intelligences:

• Interpersonal
• Intrapersonal
• Verbal/Linguistic
• Logical/Mathematical
• Naturalist
• Bodily-Kinesthetic
• Musical
• Spatial</td><td>Technologies:

ELMO

Projector and Screen

Computers

Ipads

Smart Phone Video Cameras

Websites:

YouTube
https://www.youtube.com/watch?v=SprRX6mSsEg

Bill Nye Simple Machines
http://www.youtube.com/watch?v=sOnVFR1msPk

Museum of Science
http://www.msichicago.org/play/simplemachines/

Discovery Kids
http://discoverykids.com/games/catapult/

How Stuff Works
http://science.howstuffworks.com/transport/engines-equipment/question127.htm</td><td>Standards (Content Standards, Common Core and Technology Standards)

<u>2nd Grade Science and Engineering Standards</u>
Developing and Using Models
Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.
▪ Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)
Planning and Carrying Out Investigations</td></tr>
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		Online Journal **https://penzu.com/account/signup** **Create a Graph** **http://nces.ed.gov/nceskids/createagraph/**	Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ▪ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1) **Common Core 2nd Grade Math Standards** *Measure and estimate lengths in standard units.* CCSS.Math.Content.2.MD.A.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. *Represent and interpret data.* CCSS.Math.Conten

			t.2.MD.D.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units. CCSS.Math.Content.2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems[1] using information presented in a bar graph. **Common Core 2nd Grade Language Arts Standard** *Research to Build and Present Knowledge:* CCSS.ELA-Literacy.W.2.7 Participate in shared research and writing projects (e.g., read a

			number of books on a single topic to produce a report; record science observations). **<u>ISTE Standards</u>** *Creativity and innovation* *Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.* b.Create original works as a means of personal or group expression c.Use models and simulations to explore complex systems and issues *Communication and collaboration* *Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.* a.Interact, collaborate, and publish with peers, experts, or others employing a variety of digital

			environments and media d.Contribute to project teams to produce original works or solve problems *Research and information fluency* *Students apply digital tools to gather, evaluate, and use information.* b.Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media c.Evaluate and select information sources and digital tools based on the appropriateness to specific tasks *Critical thinking, problem solving, and decision making* *Students use critical thinking skills to plan* *and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources* c.Collect and

			analyze data to identify solutions and/or make informed decisions
Materials: **Day 1: Gallon jug of sand, pulleys, rope, ramp, crowbar, wagon with wheels. Dry Erase Board and Markers** **Day 2: Computer with internet access linked to projector and screen Student computers and headphones Museum of Science site listed above** **Day 3: 'The Mighty Lever" books by InfoTrek for grades K-3, Ruler, Pencils, Tape and Blocks (for the experiment) and Glossary and Question Handout** **Day 4: Computer with internet access linked to a projector and screen. YouTube video I Love a Lever (URL listed above) and I Love a Lever Lyric and Diagram Handout (attached below)** **Day 5: Computers or Ipads for whole class with internet access and access to the following sites How Stuff Works, Bill Nye Simple Machines, and Discovery Kids (all three URLs above)** **Day 6: Various catapult materials (rubber bands, plastic spoons, spools from thread, straws, etc….) as well as graph paper and sharpened pencils with good erasers.** **Day 7: Pencils, Blind Ballots, Catapult Designs, Materials for Catapult Build, Glue, Tape Etc.., Access to Computer and use of Penzu.com (URL above) or Smart Phone (with video capabilities) to keep a daily log.** **Day 8: Catapult Materials, Catapult Designs, Smart Phones or Ipads for filming, Cotton Balls for launch and Masking Tape and Yardstick to make a launch area.** **Day 9: Catapult Materials, Cotton Balls, Tape Measurers, White Board to mark distances, Dry Erase Markers, Ipads or SmartPhones for video footage and Computers with internet access to complete graphs.**			Intelligences: Day 1: Bodily/ Kinesthetic Logical/Mathematical Spatial Verbal/Linguistic Day 2: Intrapersonal Logical/Mathematical Spatial Day 3: Interpersonal Intrapersonal Verbal/Linguistic Spatial Day 4: Interpersonal Intrapersonal Musical Spatial Verbal/Linguistic Day 5: Intrapersonal Spatial Verbal/Linguistic Day 6: Intrapersonal Logical/Mathematical

Day 10: Access to computers, Ipads and Smartphones to complete project logs and graphs.	Naturalist Spatial Day 7: Interpersonal Intrapersonal Bodily/Kinesthetic Spatial Logical/Mathematical Day 8: Interpersonal Bodily/Kinesthetic Spatial Logical/Mathematical Day 9: Interpersonal Intrapersonal Logical/Mathematical Spatial Day10: Intrapersonal Interpersonal Spatial Verbal/Linguistic Logical/Mathematical
1. **Day 1:** Students will attempt to move a gallon jug filled with sand. They will then be asked if there is an easier way to move the jug. After several suggestions have been heard the teacher will attempt to move the jug using as many of the responses as possible. Then the class will discuss which ideas worked and why. At this point the instructor will introduce the topic for the two week unit Simple Machines/Levers and write the keywords that students will be learning about throughout the unit. 2. **Day 2:** The instructor will show students a simple machines game and demonstrate how to play it by projecting his/her computer screen. Then the students will play the game online by going to the Museum of Science + Industry site listed. The game asks players to use different simple	**Day 1:** **Logical/Mathematical** **Bodily/Kinesthetic** **Spatial** **Day 2:** **Spatial** **Intrapersonal** **Verbal/Linguistic** **Logical/Mathemati**

machines to help a character collect the parts needed to complete the robot he is building. The game is designed around the concept of simple machines and reinforces some of the terminology (such as: inclined plane, force, pulley, wheel and axle) that the students received the day before. 3. **Day 3:** The instructor will read the book "The Mighty Lever" out loud to the whole class. Using the ELMO so that all students can see the diagrams. He/She will perform the experiments in the book on the ELMO as well so the whole class can see. Students will then use the book's glossary to fill in missing words on a definition handout and answer the comprehension questions listed on the back of the handout. 4. **Day 4:** Students will watch and learn the "Love a Lever Song" from YouTube (see URL above) whole class before being split into groups to memorize an assigned section of the song from a handout (see below) containing its lyrics. As the groups finish the students will return to their seats and label the lever diagrams on the back of their lyric sheet individually. Finally the whole class will come together to sing the song through with each group doing their part. 5. **Day 5:** Students will research catapults/trebuchets online using sites like Discovery Kids, How Stuff Works, (see URLs above) or other Instructor approved resources. 6. **Day 6:** Students will be given some basic materials that they can use to create a catapult. They will also be allowed to bring materials from home or look in nature to find supplies. Once they have decided on their materials each student will draw their own original catapult design. 7. **Day 7:** Students will be separated into groups and vote on one design from their team members. As a team they will begin construction of their catapults. Each student will keep a daily log (online using Penzu see URL above or via video on a smartphone) discussing their catapult project and their involvement with their team. 8. **Day 8:** Students will complete initial construction of their catapults and run trials. This includes using a smartphone to film the launch in slow motion so they can use the feedback to determine what adjustments are needed. 9. **Day 9:** Students will make modifications to their catapults and bring them to the launch area for the final run. Their launch will be filmed and the results will be measured and added to a graph each student will create using create a graph (URL listed above).	**cal** **Day 3: Verbal/Linguistic Interpersonal Spatial** **Day 4: Musical Verbal/Linguistic Interpersonal Spatial** **Day 5: Intrapersonal Verbal/Linguistic** **Day 6: Naturalist Intrapersonal Spatial** **Day 7: Interpersonal Intrapersonal Bodily/Kinesthetic Logical/Mathematical** **Day 8: Interpersonal Intrapersonal Spatial Logical/Mathematical Bodily/Kinesthetic Naturalist** **Day 9: Interpersonal Intrapersonal Logical/Mathematical Spatial** **Day10: Intrapersonal**

10. **Day 10:** Students will complete their results graph and project log then a whole class discussion will take place as the instructor asks what worked and what didn't as well as how and why questions to encourage student reflection.

Interpersonal
Spatial
Verbal/Linguistic
Logical/Mathematical

Products:

Vocabulary/Comprehension and Lever Labeling Worksheet Rubric

	Below Expectation	At Expectation	Above Expectation
Vocabulary and Lever Labeling Handout	The worksheets are only 0-50% complete The worksheets are complete but only 0-50% correct and/or Illegible	The worksheets are 75-90% complete The worksheets are 75-90% accurate The worksheets are legible	The worksheets are 90-100% complete The worksheets are 90-100% accurate The worksheets are legible and detailed.

false

Online Project Log (with video footage of the team launch) Rubric

	Below Expectation	At Expectation	Above Expectation
Project Log	The log is only 0-50% complete The audio, video or written portion of the log is indistinguishable	The log is 75-90% complete The audio,video or written portion of the log is clear and distinguishable	The log is 90-100% complete The entries are not only distinguishable but reflective and detailed

false

Catapult Launch Graph Rubric

	Below Expectation	At Expectation	Above Expectation

Intelligences:

Product 1:
Verbal/Linguistic
Spatial

Product 2:
Intrapersonal
Verbal/Linguistic

Product 3:
Logical/Mathematical
Spatial

Graph	The graph is only 0-50% complete The graph is complete but only 0-50% correct and/or Illegible	The graph is 75-90% complete The graph is 75-90% accurate The work is legible	The graph is 90-100% complete The graph is 90-100% accurate The work is legible and detailed.	

Presentation Ideas and Notes: URL to Video Presentations Regarding Unit

Movie Trailer: Simple Machines Take Over
http://youtu.be/OWFHS-pYDDo

Unit Presentation: Simple Machines Take Over ; a behind the scenes look

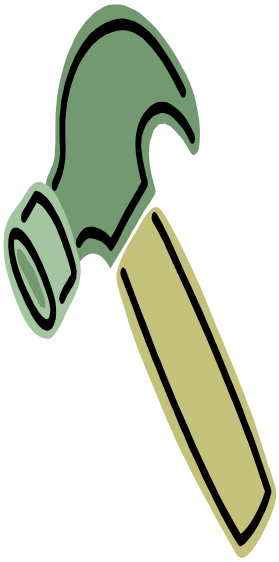
http://youtu.be/pyoeFNFzC3w

Optional: Instructor could create an Animoto presentation (https://animoto.com) using the video footage of the catapult launch set to music for the class and post it on the class webpage.

Label the parts of each LEVER

Name_____

Date_____



WORD BANK

Fulcrum

Lever

Force

Name_____ Date_____

Match the definitions with the word or words they describe from the word bank below

Something that is lifted or moved_____

The force needed to move something_____

The point on which the lever arm moves_____

A weapon from the past that used a lever to throw stones_____

A push or pull that changes the position of an object_____

Levers that have two lever arms_____

Tools that make work easier, using only muscle power_____

The point on which a lever arm moves_____

The bar that rests on the fulcrum_____

WORD BANK:

catapult

compound levers

effort

force

fulcrum

lever arm

load

simple machines

“LEVER LOVER”
By Belinda Ward

I love, love, love a lever
It may not seem like much at all
It may sound simple to you
But if you get to know a lever
Surely you would love it too
I love, love, love a lever
Yes I’m a lever lover can’t you see
I love, love, love a lever
A lever really works for me
The way it lifts a load
Makes my heart explode
Its pivoting is riveting to me
It carries weight with such ease
It leaves me weak in the knees
I love a lever endlessly
You know I love, love, love a lever
Yes I’m a lever lover thought I’d share
I love, love, love a lever
Yes I find levers everywhere
A seesaws a lever, a hammer is too, a broom is a lever
To name just a few
A scissors a lever well actually two
And so is a rake believe me its true
A shovel’s a lever and so is a bat
Your arm is a lever betcha didn’t know that
(your elbow is a fulcrum and your arm pivots on it)
I love, love, love a lever
Yes I’m a lever lover through and through
I love, love, love a lever
Levers work for me too
Pulleys are perfect and wedges are fine
A screw will do to but a lever's divine
Yes I love, love, love lever
Love a lever, love a lever
I’m a lever lover through and through
I’m a fool for the tool I am king for the machine
I love, love, love a lever
Love a lever, love a lever
Levers work for me and you
Levers work for me and you
Oh levers work for me and you
LEVERS!