GLOBAL ARTS:

Performances For Schools

Presents

Cirque Mechanics
Boomtown

Thursday, March 22, 2011 at 10am
Fine Arts Center Concert Hall

Study Guides for Teachers are also available on our website at www.fineartscenter.com - select *Global Arts* under *Resident Presenters, then select Resource Room.*

Please fill out our online surveys at http://www.umass.edu/fac/centerwide/survey/ppeef.html Thank you!

Welcome

Information for Teachers and Parents

Our goal is to offer high quality performances for young people in a safe and comfortable setting. Please help us by following the below guidelines.

Please arrive early. You should arrive at the theatre 30 minutes prior to the noted start time. Allow for travel time, parking, being seated and bathroom visits. It is important that we begin our performances on time so that all schools can meet their lunch and/or dismissal times.

Be sure to check the location of the performance when making your bus reservations. Performances take place in the Fine Arts Center Concert Hall or Bowker Auditorium in Stockbridge Hall. Please see the map at the end of this guide for driving and drop-off instructions.

Upon arrival your group will be greeted by an usher either at your bus or in the lobby. We do not issue individual tickets for performances. Your usher will direct your group to their reserved seats.

Both theaters are accessible for Mobility Impaired members. An infrared listening system is available in both theaters. Access parking is available adjacent to the theaters. An Access permit should be clearly visible in the parked vehicle. To better meet your needs, please inform us of any special seating requirements one month prior to the performance by calling 413-545-2116.

For the comfort of all our seated patrons, we request that backpacks, lunches and other gear be left on the bus. Also, please remove all hats when seated in the theater.

Food, drinks other than water, smoking, candy and gum are all not allowed in the theater. The use of cell phones, portable music players, cameras or any other recording device, including non-flash photography and cell phone cameras, is strictly prohibited. PLEASE BE SURE TO TURN OFF ALL CELL PHONES.

Any teasing, disruptive and rude behavior by students towards each other or to others seated close-by during a performance is not acceptable. Teachers and chaperones will be held responsible for any such incident reported to the Fine Arts Center staff. All complaints received will be forwarded to the schools involved. Repeated offences from the same school/s may result in cancellation of future reservations for shows.

Theatre Etiquette

Please read and review the following information with your students.
WE expect everyone to be a good audience member.
Good audience members……..

- Are good listeners
- Keep their hands and feet to themselves
- Do not talk or whisper during the performance
- Do not eat gum, candy, food or drink in the theater
- Turn off all cell phones and do not use portable music players, cameras or any other recording devices
- Stay in their seats during the performance
- Do not disturb their neighbors or other schools in attendance

Curriculum Frameworks

This performance and guide provide opportunities for your students to explore a variety of topics. For your convenience we list below applicable Massachusetts learning standards. This list is by no means exhaustive. Please use this list as a guide to assist with creating lesson plans.

Grades PreK-2:
Science Standards 3-5: Position and Motion of Objects

Grades 6-8
Science Standard 11: Motion of Objects
Art Connections, Standard 6.3: Purposes and Meanings in the Arts
Art Connections, Standard 7.2: Roles of Artists in Communities

Grades 9-12
Science Standard 1: Newton's laws of Motion and Forces
History USI.26 : Westward Expansion
Art Connections, Standard 6.7, 6.8: Purposes and Meanings in the Arts
Art Connections, Standard 7.9, 7.10: Roles of Artists in Communities

Table of Contents

"**Theatre is not theatre without an audience**."
Live theatre differs from watching television or movies. Remember that

performers can see and hear you. As an audience member you are a vital contributor to the performance experience that you and those around you will have. How you behave and how you react to the show will affect the artists' performances. That is why each performance is a unique experience, it will never be repeated exactly the same. Talking to your neighbor, sending text messages, and other similar behaviors are distracting to the rest of the audience and to the artists. Please be respectful of the artists on stage performing for you by listening quietly. Of course, it is appropriate to react to what you are seeing – some things may make you laugh, gasp out loud, or you may be asked to respond by answering questions from the performers, singing along or clapping. Most of all, it is important to be present "in the moment" by being attentive and enjoy the performance. And of course – show your enthusiastic appreciation by applause at the end of the performance!

SHOW DESCRIPTION

Be transported to the 1860's small frontier town of Rosebud, where two ambitious saloon owners have set up shop in the hopes of cashing in on the town's gold rush frenzy. The circus that ensues when they begin to feud for the townsfolk patronage, leads to a series of explosive events, exciting brawls, an unexpected romance and a lucrative discovery.

Once again, as with their previous production Birdhouse Factory, Cirque Mechanics explores the relationship between man and machine. Inspired by early mining equipment and the spirit of adventure that brought prospectors and entrepreneurs alike out west searching for gold, Boom Town, features innovative and one of a kind mechanical apparatus that serve both as scenery and performance prop. You will find performers climbing up swaying telegraph poles, dancing on a swinging chandelier, flying high and fast on a revolving crane, flipping and jumping on moving ore carts or balancing on whiskey jugs.

Boom Town takes you beyond the town and deep into the mine to join in the excitement of exploration and experience the thrill of discovery. You'll be inspired to pick up your picks and pans, hop in an ore cart and come along for the ride!

INTRODUCTION

Cirque Mechanics Boom Town presents various educational opportunities and provides the platform for many discussions and lessons not only about the theater and the circus, but also about Science, Mathematics, American History and Art.

This Study Guide will focus on the following subjects to be used as jumping points for further teaching and discussion:

SCIENCE

There are several basic scientific principles repeatedly demonstrated in the show by the circus acrobats and/or the mechanical props.

HISTORY AND SOCIAL STUDIES

The frontier town c. 1880's, the "period" costumes and the music give Boom Town historical perspective, richness and value, and provide a look at western expansion and pioneer life in the American West.

ART

The artistic influence for Boom Town comes directly from classic western films, television and books.

SIMPLE MACHINES

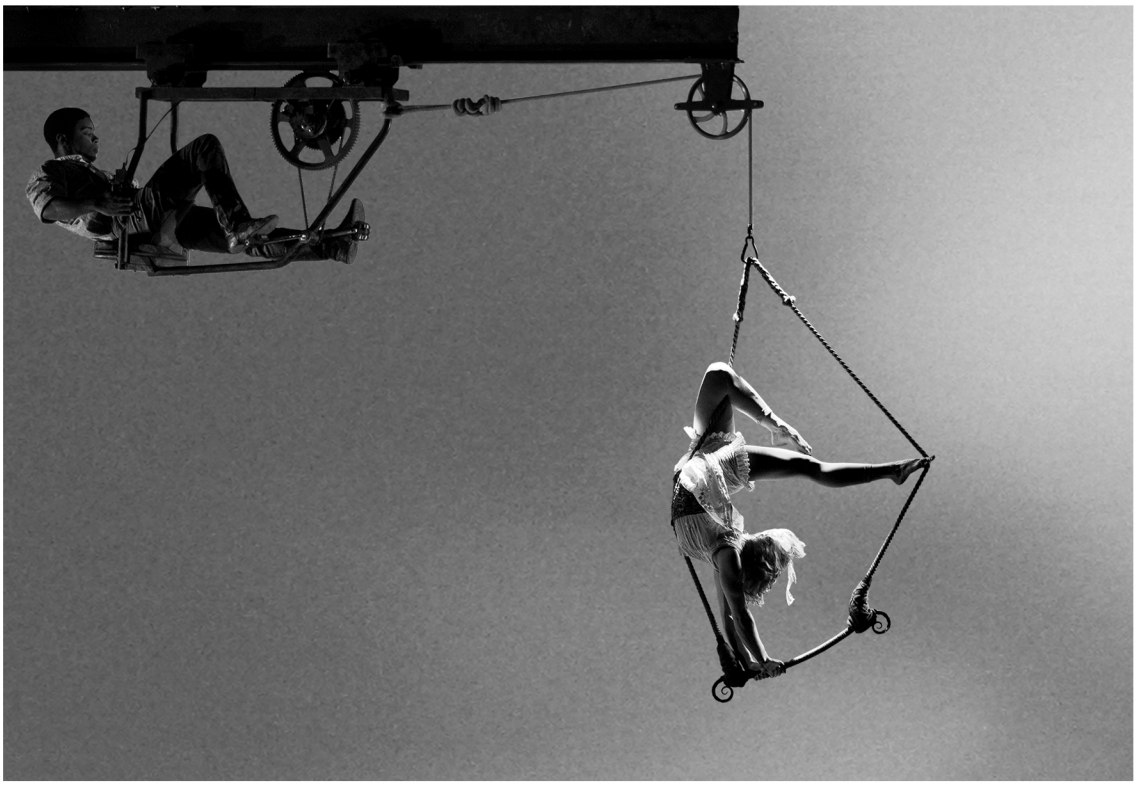
Simple machines are tools that make work easier. They have few or no moving parts. These machines use energy to work. There are several simple machines used throughout the performance of Boom Town.

PULLEY

This simple machine is made up of a wheel and a rope. The rope fits on the groove of the wheel. One part of the rope is attached to the load. When you pull on one side of the pulley, the wheel turns and the load will move. Pulleys let you move loads up, down, or sideways. Pulleys are good for moving objects to hard to reach places. It also makes the work of moving heavy loads a lot easier.

PULLEY IN BOOM TOWN

A pulley can be seen at the end of the long beam of the crane. The pulley directs the rope from the horizontal pulling location to the aerialist below.



WHEEL AND AXLE

The wheel and axle is another simple machine. The axle is a rod that goes through the wheel. This lets the wheel turn. It is easy to move things from place to place with wheels and axles.

WHEEL AND AXLE IN BOOM TOWN

The wheel and axle can be seen on the bicycle device that is suspended from the overhead crane. An acrobat sits in the chair and pedals the unit. The pedals drive a large gear which functions like a wheel. This gear has an axle through it which helps to attach it to the bicycle device. The acrobat pedals this bicycle away from the pulley lifting the aerialist.

Another place you can find other wheels would be the ore carts. The wheels and axles on the ore carts allow for the trampolines to roll along the rails and for the acrobats to travel along the tracks while they leap and flip.

INCLINED PLANE

An inclined plane is a simple machine. It is a flat surface that is higher on one end. You can use this machine to move an object to a lower or higher place. Inclined planes make the work of moving things easier. You would need less energy and force to move objects with an inclined plane

INCLINED PLANE IN BOOM TOWN

The planks that are used as acrobatic slides are examples of inclined planes. The artists use these to walk up and over each other and to flip off of creating a kind of springboard.

NEWTON'S LAWS OF MOTION

SIR ISAAC NEWTON BRIEF BIOGRAPHY

Sir Isaac Newton (4 January 1643 – 31 March 1727) was an English physicist, mathematician, astronomer, natural philosopher, and alchemist. His treatise Philosophiae Naturalis Principia Mathematica, published in 1687, described universal gravitation and the three laws of motion, laying the groundwork for classical mechanics, which dominated the scientific view of the physical universe for the next three centuries. He showed that the motion of objects on Earth and of celestial bodies are governed by the same set of natural laws by demonstrating the consistency between Kepler's laws of planetary motion and his theory of gravitation, thus removing the last doubts about heliocentrism (the sun at the center of the universe) and advancing the scientific revolution.

MOTION

Motion is one of the key topics in physics. Everything in the universe moves. It might only be a small amount and very slow, but movement does happen. Don't forget that even if you are standing still, the Earth is moving around the Sun and the Sun is moving around our galaxy. The movement never stops. Scientists also use the term mechanics to describe motion. Over the years, scientists have discovered several rules or laws (like Newton's Laws of Motion) that explain all motion you might find.

MOMENTS OF MOTION/MECHANICS IN BOOM TOWN

There are many examples of motion in Boom Town both human and mechanical. There is motion in dancing and acrobatics and even in setting the stage and shifting scenery and props.

FIRST LAW

I. Every object in a state of uniform motion tends to remain in that state of motion unless acted upon an external force.
Once moving at a steady speed...in a straight line...it will continue moving...at a steady speed...in a straight line.
Once standing still...it will stay still.

First Law of Motion in Boom Town

It takes a lot of energy to push the ore carts and get them to roll.

SECOND LAW

II. Acceleration is proportional to the force and inversely proportional to the mass (F=ma). Simply stated, a force causes an object to accelerate.

It accelerates in the direction... that you push it.If you push twice as hard... it accelerates twice as muchIf it gets twice the mass...it accelerates half as much.

Second Law of Motion in Boom Town:

This concept too can be illustrated by the ore carts. It is much more difficult to push the large ore cart. It takes two people to get it moving quickly, but the small ore cart is much lighter and can be pushed by one person alone.

THIRD LAW

III. For every action there is an equal and opposite reaction.
If you push on it...it pushes on you.

Third Law of Motion in Boom Town:

The trampoline beds and spring illustrate this point. As the artists bounce on the trampoline ore cart the bed of the trampoline flexes and the strings and springs stretch, they springs then rebound and push against the artist propelling them into the air.

Simple and Complex Movement

There are two main ideas when you study mechanics. The first idea is that there are simple movements, such as if you're moving in a straight line, or if two objects are moving towards each other. Ideas like acceleration and velocity are simple ideas to physicists.

Simple Movement:

There are also more complex movements for which not all of the laws apply. Ideas like work or complex combinations of forces fall into this category. These examples stretch the limits when you learn about mechanics. Examples of complex motion include motion that happens in a circular direction. You might be looking at angular acceleration or centripetal forces as you spin a ball that is tied to a string.

Complex Movement:

When the aerialist runs in a large circle on the floor and is lifted into the air she swings in a circular path. You can also see complex movement as the crane rotates very quickly causing the aerialist to swing out creating an even larger circular flight.

HISTORY

The time in history that inspired the creators of Boom Town was that of the American Westward Expansion and the great Gold Rush (1804-1890). This was a time of exploration and discovery.

The discovery of gold profoundly affected the American social, political and cultural landscape. Boom Town attempts to display, in a dynamic and lighthearted way, daily life in a pioneer town. Boom Town is sprinkled with historically accurate elements that add realism to the fictional characters and storyline.

Gold Rush : What started it all?

A small sparkling particle, the size of half a pea set off the events in history know as the Gold Rush, it was January 24, 1848 when James W Marshall discovered gold in the American River at Sutter's saw mill in California. The news of the gold discovery quickly spread across the country and soon thousands of men had caught "gold fever". They left their homes and families behind with the hopes of striking it rich.

Why did they rush?

It seems difficult to comprehend why men abandoned their families and risked their lives traveling across treacherous territory for gold. But in 1849 a prosperous farmer made about $300 a year, a factory worker about $1 a day and a skilled craftsman could make up to $1.50/day. But in California, gold was free to anyone who could find it. A miner could take $25 to $35 of gold a day–or more – out of a riverbed.

Were miners rich?

Tales of great discoveries and stories of miners becoming instantly wealthy spread across the country. Sadly only a select few truly struck it rich! Most miners were not so lucky. Mines were quickly claimed and promptly picked clean.

Was anyone rich?

Entrepreneurs! Many people became rich without ever having to dig for gold. Smart businesspeople opened supply stores and offered services to the miners at a steep price. A pound of sugar for example sold for $2.00 (more than it costs today!) and a pound of coffee sold for $4. Women would charge $25 for a home cooked meal and could earn up to $50 a week to wash shirts.

Who was a miner?

Miners came to America from all over the world in search of their share of the gold. Fighting broke out between Americans and foreign miners from Mexico, Chile, Peru and China over land rights and claims.

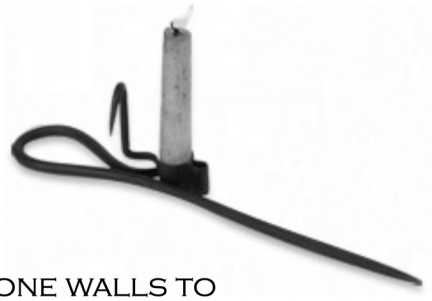
Was all the gold picked?

Eventually, much of the gold that could be found by hand had been mined and heavy equipment was needed to dig out the rest. Many miners went back home penny less, many lost their lives to diseases like chol era, mining accidents or on their journeys. Yet others stayed in California and started businesses in the boom towns or farmed the lands.

Classroom Fun:

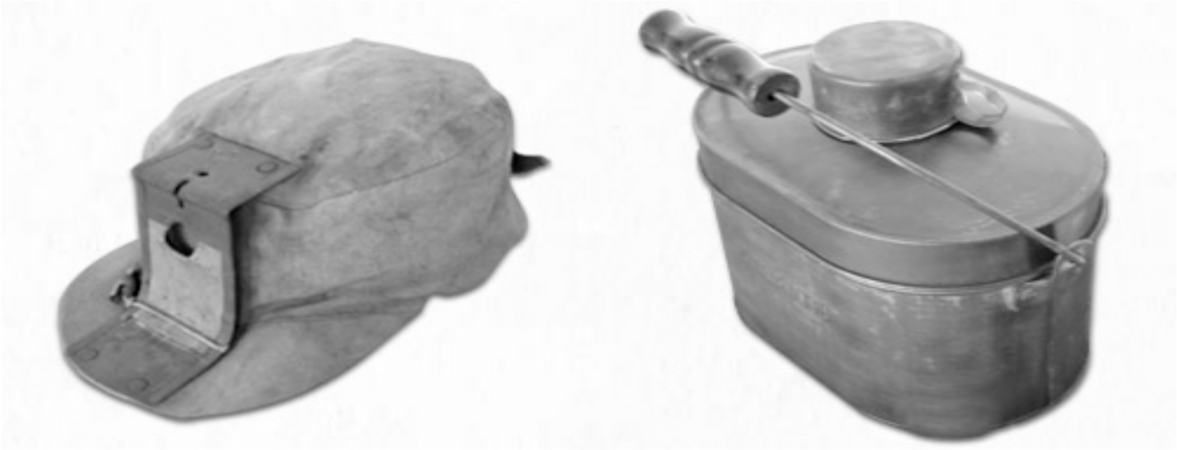
1. Mining Town Diorama: Construct a shoebox diorama of a gold town. Include miners' camps, staked-out claims, and various mining techniques.
2. Make your own gold nuggets: spray small pebbles or stones with metallic gold paint to simulate gold nuggets. Simulate panning for gold.

TOOLS OF THE TRADE



Miner's Candlestick

Sometime in the 1860's, Comstock area miners invented the miner's candlestick by bending the end of a spike to hold the candle. The spike then could be jabbed into wooden support beams or crevices in the stone walls to light the way. The first candlestick was patented in 1872 and sometime soon after a hook was added to the many emerging designs. Like the lump of clay, the hook on the candlestick enabled the miner to attach a candle to his cap, creating a 19th century version of a headlamp.



Mining Hats

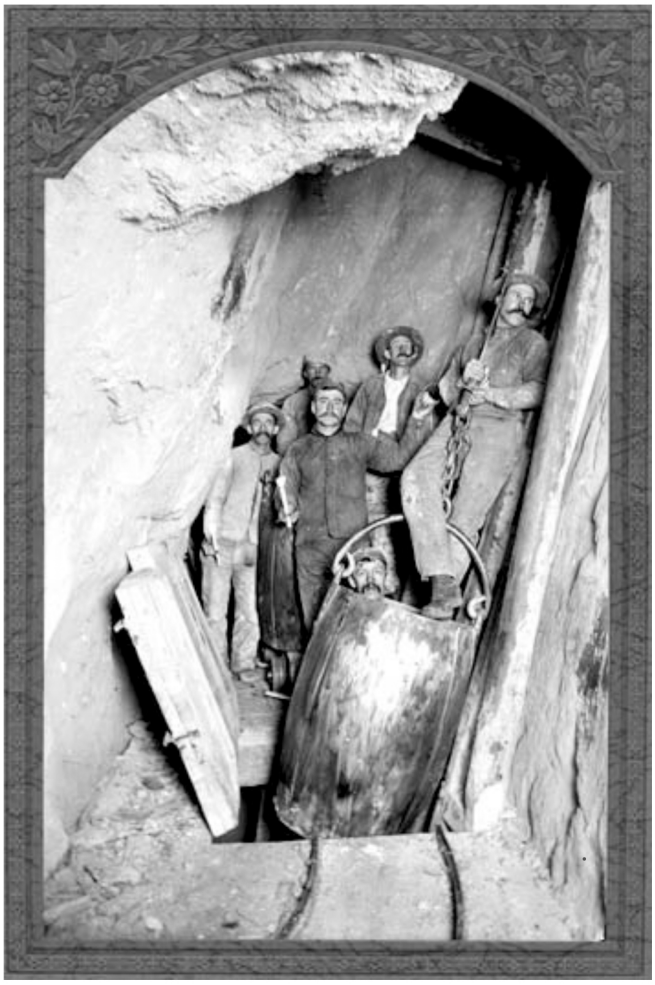
Prior to the mid-1800s, miners secured candles to their caps or the rocky walls of the mine using a clump of clay. In the 1800's, miners did not have hard hats to protect their heads. Instead they wore cloth miner's caps like this one or simply used their everyday felt hats. Note the metal plate on this hat with a small hole at the top. The hook of a candlestick or an oil wick lamp would fit into the hole, allowing the miner to light his way while keeping his hands free for other tasks.

Miner's Lunch Bucket

Like many elements of hard-rock mining, the miner's lunch bucket came to America with the Cornish miners who left the failing tin and copper mines of Cornwall to seek new opportunities abroad. Containing two, and sometimes three, compartments, the lunch pail readily met the miner's needs. The lower compartment contained tea that could be heated by the flame of a candle beneath it. The second compartment, created by a drop-in tray, held the traditional Cornish pasty, a mixture of meat, potatoes, and vegetables tucked inside a folded pasty shell. If a third compartment existed, created by a second tray, it typically held a dessert. Finally, in order to drink the tea, the miner attached a tea cup to the lunch bucket's lid.

Ore bucket

While some mines in the 19th century had tunnels entering the side of a mountain, many had shafts that went straight down. These deep and dangerous pits posed a challenge for transporting men up and down. Cages built on platforms were generally used in the larger mines. For the smaller mines, the ore bucket was the ride of the day. Large enough for a man to climb inside, the bucket could conveniently carry more than one person by having an additional miner or two stand on the bucket's rim. You can imagine how scary that would be if the ride was jerky.

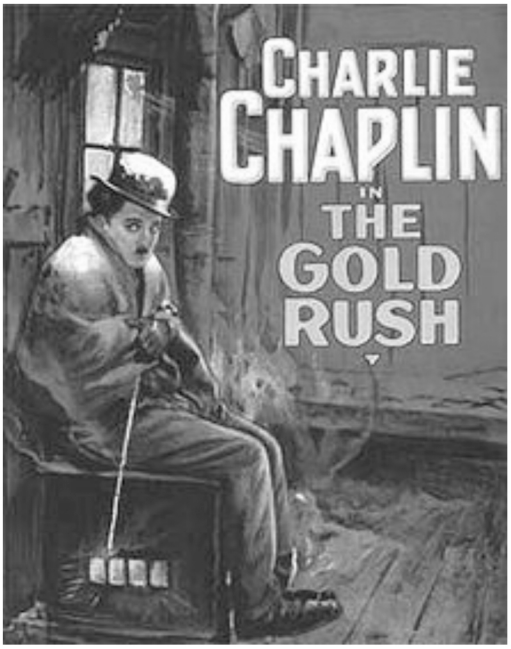


Pans

Gold panning is mostly a manual technique of sorting gold. Wide, shallow pans are filled with sand and gravel that may contain gold. The pan is submerged in water and shaken, sorting the gold from the gravel and other material.

As gold is much denser than rock, it quickly settles to the bottom of the pan. The panning material is usually removed from stream beds, often at the inside turn in the stream, or resting on the bedrock bed of the stream, where the density of gold allows it to concentrate. This type of gold found in streams or dry streams are called placer deposits.

ART



Sir Charles Spencer Chaplin, Jr. (1889-1977), better known as Charlie Chaplin, was a British comedy actor famous for his involvement in silent films.

The main character in many of Chaplin's movies was "The Tramp" a pleasant and good mannered vagrant. The character wears a tight coat, over sized trousers and shoes, a derby, carries a bamboo cane, and has a signature toothbrush mustache. In the 1925 silent film, Gold Rush, Charlie Chaplin's The Tramp travels to the Yukon to take part in the Klondike Gold Rush where he soon gets mixed up with some burly prospectors and falls in love with the beautiful and lonely saloon girl, Georgia.

The gold Rush enjoyed great box office success, it is in fact the highest grossing silent comedy film in history. Though a silent film, The Gold Rush received an Academy Awards nomination for Best Sound Recording. In 1992 The Gold Rush was selected for preservation in the United States National Film Registry by the Library of Congress as being "culturally, historically, or aesthetically significant". Charlie Chaplin proclaimed, after its original release, that this was the film for which he wanted to be remembered.

The comedic characters of the dueling saloon owners and the lovely saloon girl in Boom Town were inspired by Chaplin's characters in The Gold Rush.

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http://www.isu.edu/~trinmich/teacher.html

Learning Activity

Demonstration of Newton's Three Laws of Motion and the Law of Gravitation

Objectives:
The students will:
1) give examples of each of Newton's three laws as they occur in everyday experiences
2) visualize and differentiate the difference between a direct proportion and an inverse proportion using the formula F=ma
3) understand how the gravitational law affects the tides of the earth
4) calculate the actual gravitational force between the sun and earth and the moon and earth to conclude which has the stronger influence

Background Information
Isaac Newton summed up motion in three laws. Today we take these laws for granted as we grow up assuming they are true. We do not realize the struggles scientists went through in attempt to understand the world around them. The following activities use brainstorming, discussion, and simple labs to illustrate the laws.
Newton's Three Laws:
1) An object which is moving at a constant velocity or at a state of rest does not change its state unless a force acts upon it.
2) Acceleration of an object increases as the amount of force causing the acceleration increases when mass is constant.
3) For every force, there is an equal and opposite force.

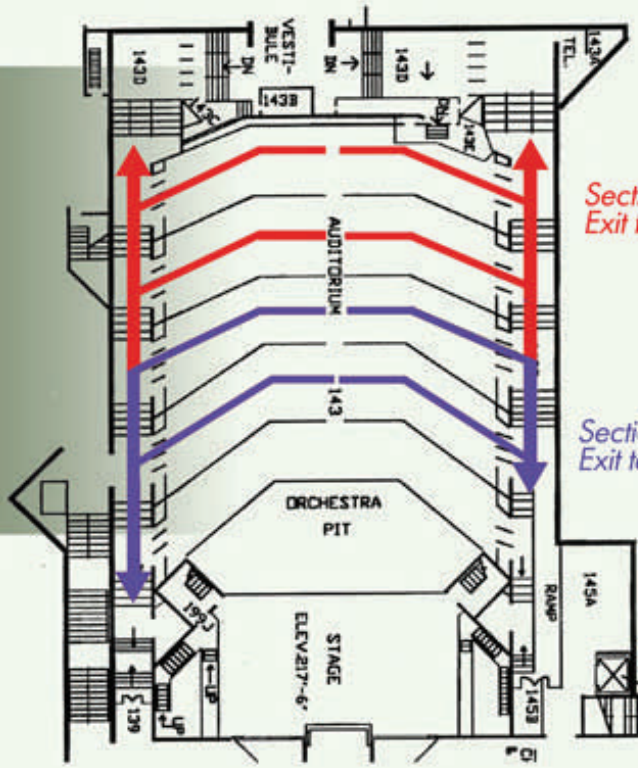
ACTIVITY #1:
Newton's First Law 20 min
MATERIALS: CHALK AND BLACKBOARD
PROCEDURE:
1) Brainstorm everyday examples of the first law.
2) Present a lecture to students, including the following necessary background information: Just prior to Newton's time Galileo had worked with the idea of acceleration. Galileo could only guess about time since precise clocks had not been invented. This is why he rolled metal balls down smooth ramps. Since he noticed how a ball slowed when rolling across the floor, he concluded that friction was the cause. Thus friction was responsible for the idea that objects in motion naturally come to rest. But 'rest' is just one kind of constant velocity. The concept of inertia and Newton's 1st law emerged from this insight.
3) Use some of the following examples to explain to the students how Newton's first law occurs in everyday events:
a) car suddenly stops and you strain against the seat belt
b) when riding a horse, the horse suddenly stops and you fly over its head
c) the magician pulls the tablecloth out from under a table full of dishes
d) the difficulty of pushing a dead car
e) lawn bowling on a cut and rolled lawn verses an uncut lawn
f) car turns left and you appear to slide to the right

For the remaining activities please visit:
http://www.clas.ufl.edu/users/ufhatch/NSF-PLANS/2-2_NEWTON.htm

Evacuation Procedures

In the event of an emergency requiring evacuation of the building, procedures are in place to ensure that the audience can exit safely.

Concert Hall



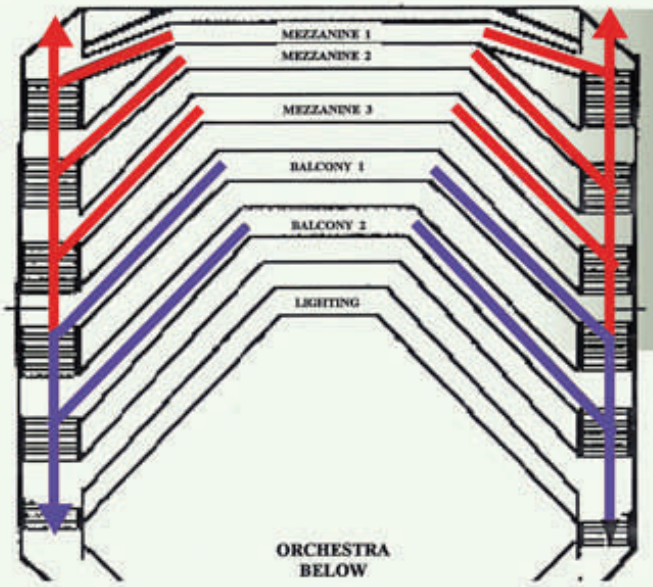
Sections 4, 5, 6
Exit through the lobby.

Sections 1, 2, 3 & Pit
Exit toward stage.

Note: Interior house conditions may necessitate alternate exit routes.

Balconies

Mezzanine 1, 2, 3
Exit rear through lobby.



Balconies 1, 2 exit toward stage, up two flights and down interior fire escape

PARKING AND DIRECTIONS FOR THE FINE ARTS CENTER'S
CONCERT HALL and RAND THEATER

School Bus Parking: Students should be dropped-off at Haigis Mall off of Massachusetts Avenue. University Security will direct buses to an appropriate parking lot during the performance (typically by the football stadium). PLEASE BE SURE YOUR BUS DRIVER KNOWS THAT ALL PERFORMANCES LAST APPROXIMATELY 1 HOUR AND THEY SHOULD RETURN A FEW MINUTES BEFORE THE ANTICIPATED END TIME. If drivers are not with the buses, they may miss the radio call from security asking them to return for pick-up, resulting in unnecessary delays returning to your school.

Individual cars: If necessary, individuals may drop-off students with a chaperone at Haigis Mall (you will be directed by security to the mid-point turn of Haigis Mall – see map) prior to parking. **We recommend parking in the Campus Center Parking Garage to avoid searching for a metered space.** It is a five-minute walk to the Concert Hall. All other available parking during weekdays is at meters. Available lots and pricing (current as of 1/1/07) are listed below:

Parking in the Garage is available to our patrons at a discounted rate of $1. To receive this rate you MUST give the Garage attendant a parking pass. To receive your pass, please call our office to let us know that you will be arriving by car. Parking passes are sent with the invoices. Please call (413) 545-2116 if you didn't receive one.

Parking meters are enforced Monday – Friday, 7AM – 5PM. Meter rates are $1.00 per hour.

Parking Garage – near Campus Center, across from the Mullins Center off Commonwealth Avenue
Lot 34 – Behind Visitors Center with 3, 5 & 10-hour meters available
Haigis Mall – 2 hour maximum on meters
Lot 62 - Adjacent to Fernald Hall with 3 hour maximum on meters, limited spaces available.

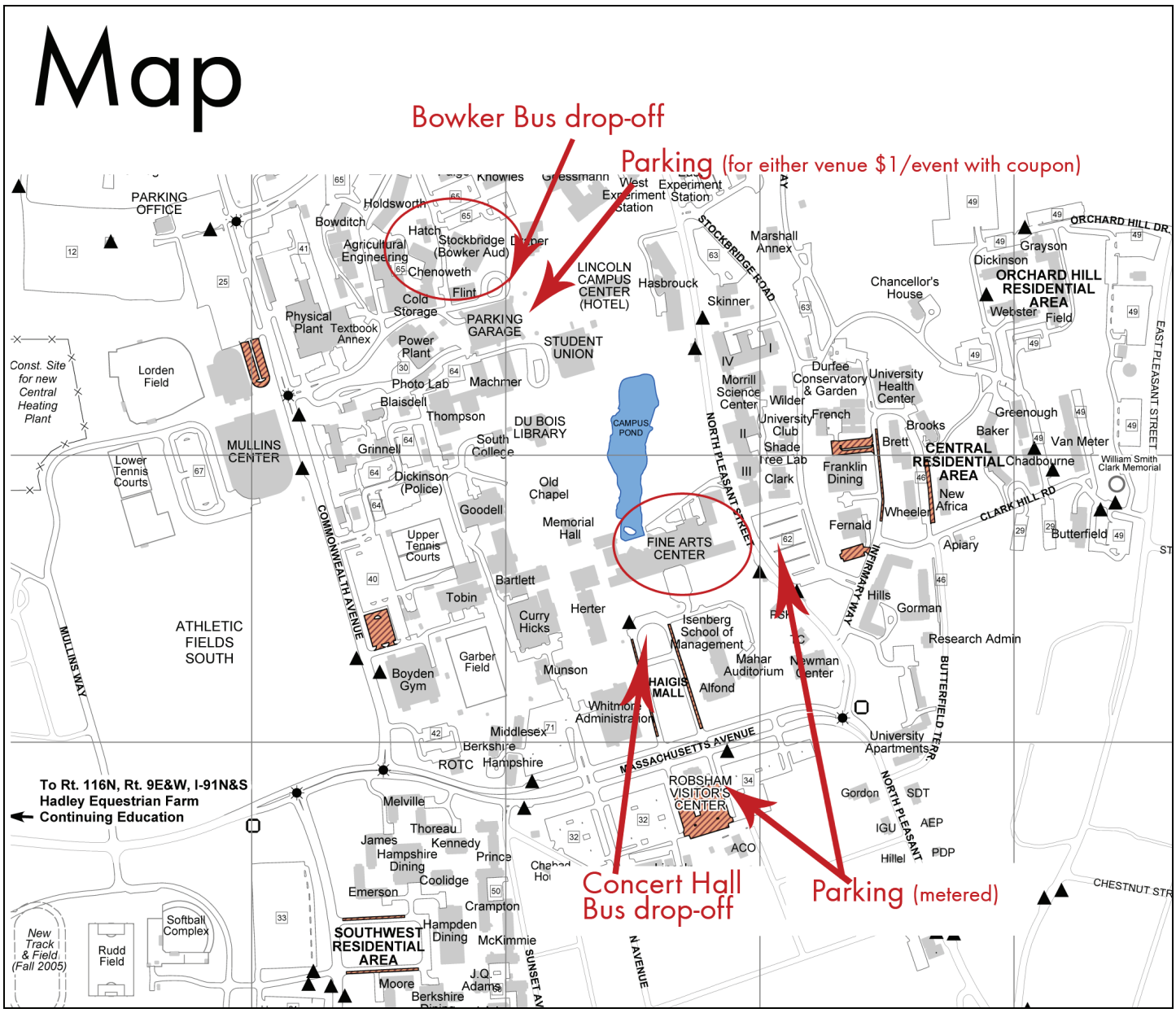
From the North: (Vermont, Greenfield) I-91 south to Route 116. Follow signs on 116 "To the University of Massachusetts." Exit ramp leads to Massachusetts Avenue. Turn left (east) on to Massachusetts Avenue toward the campus. Continue through one light and watch for Lot 34 by the Visitors Center on your right and the entrance to Haigis Mall on your left.

From the South: (Springfield, Holyoke) I-91 north to Route 9. Turn right (east) on Route 9 over the Coolidge Bridge and through Hadley. Turn left (north) on Route 116 (across from Staples) heading toward campus. Turn right at first exit at "University of Massachusetts," then bear right onto Massachusetts Avenue toward campus. Continue through one light and watch for Lot 34 by the Visitors Center on your right and the entrance to Haigis Mall on your left.

From the West: (Northampton, Pittsfield) Route 9 east through Northampton and over Coolidge Bridge. Follow remaining directions under "From the South".

From the East: (Belchertown, Ludlow) North on Routes 21, 181 or 202 to Route 9 into Amherst. Right on to North Pleasant Street (main downtown intersection), north through center of town. Turn left at Triangle Street (Bertucci's Restaurant on your right), rejoining North Pleasant Street. To reach Lot 34 and Haigis Mall continue on main road, which becomes Massachusetts Avenue. Haigis Mall will be on your right, Lot 34 on your left.

Map



For Concert Hall, Rand Theater and Bowker Auditorium – Patrons traveling by car are encouraged to park in the parking garage. Discounted parking is available in the garage for $1. A parking permit is required for discounted parking in the garage. Please call the Arts & Educational Programs Office if you require permits at (413) 545-2116. All other parking on campus is at available meters at the rate of $1 per hour. Parking is enforced Monday – Friday, 7AM – 5 PM.

Buses will drop-off students as indicated on map. Buses will be given parking instructions by Campus Security.