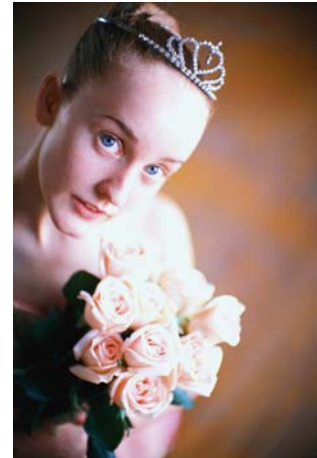


The History of Ballet

Ballet is a form of dancing performed for theatre audiences. Like other dance forms, ballet may tell a story, express a mood, or simply reflect the music. But a ballet dancer's technique (way of performing) and special skills differ greatly from those of other dancers. Ballet dancers perform many movements that are unnatural for the body. But when these movements are well executed, they look natural.



The beginnings of ballet can be traced to Italy during the 1400's at the time of the Renaissance. During the Renaissance, people developed a great interest in art and learning. At the same time, trade and commerce expanded rapidly, and the dukes who ruled Florence and other Italian city-states grew in wealth. The dukes did much to promote the arts. The Italian city-states became rival art centers as well as competing commercial centers. The Italian dukes competed with one another in giving costly, fancy entertainments that included dance performances. The dancers were not professionals. They were noblemen and noblewomen of a duke's court who danced to please their ruler and to stir the admiration and envy of his rivals.

Catherine de Medici, a member of the ruling family of Florence, became the queen of France in 1547. Catherine introduced into the French court the same kind of entertainments that she had known in Italy. They were staged by Balthazar de Beaujoyeux, a gifted musician. Beaujoyeux had come from Italy to be Catherine's chief musician. Ballet historians consider one of Beaujoyeux's entertainments, the Ballet Comique de la Reine, to be the first ballet. It was a magnificent spectacle of about 5 1/2 hours performed in 1581 in honour of a royal wedding. The ballet told the ancient Greek myth of Circe, who had the magical power to turn men into beasts. The ballet included specially written instrumental music, singing, and spoken verse as well as dancing--all based on the story of Circe. Dance technique was extremely limited, and so Beaujoyeux depended on spectacular costumes and scenery to impress the audience. To make sure that the audience understood the story, he provided printed copies of the verses used in the ballet. The ballet was a great success, and was much imitated in other European courts.

French leadership. The Ballet Comique de la Reine established Paris as the capital of the ballet world. King Louis XIV, who ruled France during the late 1600's and early 1700's, strengthened that leadership. Louis greatly enjoyed dancing. He took part in all the ballets given at his court, which his nobles performed, but stopped after he became fat and middle-aged. In 1661, Louis founded the Royal Academy of Dancing to train professional dancers to perform for him and his court.

Professional ballet began with the king's dancing academy. With serious training, the French professionals developed skills that had been impossible for the amateurs. Similar companies developed in other European countries. One of the greatest was the Russian Imperial Ballet of St. Petersburg, whose school was founded in 1738.

The French professional dancers became so skilled that they began to perform publicly in theatres. But in 1760, the French choreographer Jean Georges Noverre criticized the professional dancers in his book *Lettres sur la danse, et sur les ballets* (Letters on Dancing and Ballets). Noverre complained that the dancers cared too much about showing their technical skills and too little about the true purpose of ballet. This purpose, he said, was to represent characters and express their feelings. Noverre urged that ballet dancers stop using masks, bulky costumes, and large wigs to illustrate or explain plot and character. He claimed that the

dancers could express these things using only their bodies and faces. So long as the dancers did not look strained or uncomfortable doing difficult steps, they could show such emotions as anger, joy, fear, and love. Noverre developed the ballet d'action, a form of dramatic ballet that told the story completely through movement.

Most of Noverre's ballets told stories taken from ancient Greek myths or dramas. But during the early 1800's, people no longer cared about old gods and heroes. The romantic period began as people became interested in stories of escape from the real world to dreamlike worlds or foreign lands.

Ballet technique was expanded, especially for women, to express the new ideas. For example, women dancers learned to dance on their toes. This achievement helped them look like heavenly beings visiting the earth but barely touching it. Romantic ballet presented women as ideal and, for the first time, gave them greater importance than men. Male dancers became chiefly porters, whose purpose was to lift the ballerinas (leading female dancers) and show how light they were.



The Italian choreographer Filippo Taglioni created the first romantic ballet, *La Sylphide* (1832), for his daughter Marie. She danced the title role of the Sylphide (fairylke being) in a costume that set a new fashion for women dancers. It included a light, white skirt that ended halfway between her knees and ankles. Her arms, neck, and shoulders were bare. Marie Taglioni, with her dreamlike style, became the greatest star of the Paris stage. But soon afterward, her chief rival, the Austrian ballerina Fanny Elssler,

danced in Paris and gained many followers. Her style expressed strong, human feelings. She was outstanding in the title role of *La Gypsy* (1839), and also became famous for her lively Spanish character dances.

Another Italian ballerina, Carlotta Grisi, combined the qualities of Marie Taglioni and Fanny Elssler in *Giselle* (1841), the outstanding ballet of the romantic period. In the first act, she portrayed a simple peasant girl who dies for love. In the second act, she played the spirit of the dead girl in an unearthly style.

Paris remained the capital of the ballet world during the early 1800's. But many dancers and choreographers who trained and worked there took their technique to cities in other countries. Perhaps the most important of this group was Marius Petipa, who joined the Russian Imperial Ballet of St. Petersburg (now the Kirov Ballet). He helped to make St. Petersburg the world centre of ballet. Petipa's speciality was creating spectacular choreography for women. The leading roles in his *Sleeping Beauty* and *Swan Lake*, created in the 1890's, are still the parts desired most by ballerinas. The St. Petersburg company produced some of the greatest ballet dancers of all time. Among the best known were Anna Pavlova and Vaslav Nijinsky. Pavlova became world famous for her outstanding grace. Nijinsky thrilled audiences with his great expressiveness and his magnificent leaps, during which he seemed to float through the air. Both Pavlova and Nijinsky also danced with another famous Russian company, the Diaghilev Ballets Russes. Sergei Diaghilev, one of the world's greatest ballet producers, established the Ballets Russes in 1909. Michel Fokine was the first choreographer of the Ballets Russes. He had worked earlier with the St. Petersburg company, which did not accept his advanced ideas. Fokine urged that technique be a means to express character and emotion. He felt that a dancer's entire body, rather than separate mimed gestures, should express the story at all times. He also urged that all the arts involved in a ballet be blended into a harmonious whole. With Diaghilev's company, Fokine had the opportunity to carry out his ideas. He created such

brilliant works as Prince Igor (1909), The Firebird (1910), and Petrouchka (1911). Diaghilev's company broke up with his death in 1929. His dancers and choreographers then joined companies in many parts of the world, and strongly influenced ballet wherever they went.

The growth of ballet in the United States was largely a result of Russian influence. George Balanchine, who worked for Diaghilev's Ballets Russes as a young man, cofounded the company that became the world-famous New York City Ballet. Mikhail Mordkin, a principal dancer from Moscow, started the company that eventually became American Ballet Theatre under the direction of Lucia Chase. American-born choreographers and dancers also contributed to the development of American ballet. Choreographers such as Ruth Page, Agnes de Mille, and Jerome Robbins created dances to specifically American themes. American dancers who have gained fame in the 1900's include Maria Tallchief, Suzanne Farrell, Cynthia Gregory, Edward Villella, and Arthur Mitchell.



During the mid-1900's, many choreographers based their works on dramatic action. For example, Pillar of Fire (1942), by Antony Tudor of the United Kingdom, told a story of rebellion and repentance. Fancy Free (1944), by the American choreographer Jerome Robbins, featured three sailors looking for fun in New York City. In Germany, the British choreographer John Cranko created full-length ballets for the Stuttgart Ballet based on plots from works by William Shakespeare and Alexander Pushkin.

Today, many choreographers prefer to display dancing without a story--either as an expression of the music or as a study in a particular style of movement. The greatest influence in this type of ballet was George Balanchine of the New York City Ballet. Balanchine's works included a series of collaborations with the Russian-born composer Igor Stravinsky, which reached its height in the masterpiece Agon (1957). Balanchine also created choreography for more romantic music, such as Vienna Waltzes (1977). Sir Frederick Ashton of the United Kingdom's Royal Ballet also choreographed nondramatic ballets, such as Symphonic Variations (1946) and Monotones (1966). Outstanding teachers of the art of ballet during the 1900's have included the Irish-born Dame Ninette de Valois, founder of the company that eventually became the Royal Ballet; the Polish-born British ballet director Dame Marie Rambert; and the gifted Russian-British teacher Vera Volkova.

Contemporary ballets reflect a wide variety of styles. During the 1970's, some ballet companies began to perform modern dance works. For example, the American Ballet Theatre commissioned modern-dance choreographer Twyla Tharp for Push Comes to Shove (1976).

Several third party sources were used to compile this information and thus, it is not necessarily the complete work of anyone involved @dance4it.

Ballet: Choreography



A ballet's choreography (arrangement of dance movements) may be based on such sources as a story, a musical composition, or a painting. If a choreographer's idea comes from a story, the dancers take the roles of the story's characters. If a choreographer's idea comes from

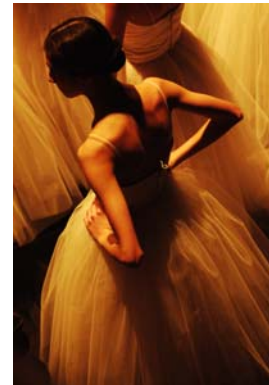
music or a painting, the dancers create a mood or image like that of the original work.

Few choreographers know what they are going to do when they start to rehearse a new ballet. Choreographers usually have only basic plans about what they want to create and the style of movement they want to use. They develop these plans with dancers at a rehearsal. It is almost impossible for choreographers to picture what the ballet will look like. Unlike most other artists, they cannot create alone.

Choreographers seldom use words to develop and teach a new ballet. Most of them can dance, and they show the dancers the movements they want. The dancers imitate the movements until they learn their roles. Some choreographers demonstrate steps exactly. Others give a general demonstration, watch the dancers try it, and then get more ideas from them. Sometimes the choreographer may simply say something like "Please waltz around a bit," and then adapt something a dancer happens to do. Although all choreographers have their own methods, most of these specialists are influenced by the dancers with whom they work.

Ballet : Music, Scenery and Costumes

Music may be written especially for a ballet. But original music is expensive, and only a few large ballet companies can occasionally afford it. A choreographer usually selects music that has already been written, such as a symphony or a concerto. The music may even have given the choreographer the idea for the ballet. Most ballets are composed to music that is no longer protected by copyright. Therefore, no payment is required to use it. Existing music. When choreographers select music that has already been written, they think first about what appeals to them. There is no rule for selecting the music. Most people would agree that the lovely, melodic music of Franz Schubert is danceable. They might also agree that the harsh, jagged sounds and rhythms of Arnold Schoenberg's music are not danceable. But choreographer Antony Tudor composed one of his greatest ballets, *Pillar of Fire* (1942), to the music of a work by Schoenberg.



After selecting the music, choreographers listen to it until they feel they understand its mood and structure. Then they begin work on the choreography of the ballet with the dancers and a pianist or a recording of the music.

Many people believe that the most musical choreographers are those who make the ballet movements follow the music's rhythms exactly. But any beginner can do that--and such a ballet would be dull. Skilled choreographers want their ballets to express more than the music expresses. Instead of following the beats of the rhythm, they arrange dance steps that go with the longer phrases of music. To create special effects or dramatic effects, choreographers may make the steps go against the music.

Ballet: Dancers and their Training



A ballet dancer can perform the difficult steps of ballet only after many years of hard training. The best age for a person to begin ballet lessons is when he or she is between 8 and 10 years old. A serious student—one who plans a professional dancing career--may be taking three to six lessons a week by the age of 12. Most dancers become professionals before they are 20, and retire by 45. It is difficult for a dancer to practice at home, and most dancers go to a studio and enroll in a class. Practice requires the space of a studio, and a piano accompaniment is helpful.

Even professional ballet dancers practice daily to remain skilled and to stay in top physical condition. During a performance, they should show no sign of strain or effort, and should appear to be completely absorbed in their dramatic role or in the music. The audience should be aware only of the beauty and expressiveness of the performance, not its technical difficulties.

To dancers, technical ability is a means to an end, not the goal itself. For example, they develop the skill to stay in balance while standing on one leg and extending the other backward. But a dancer who takes this position is not saying to the audience: "See what I can do." Instead, he or she may be saying: "I am striving to reach something so beautiful that it does not seem to belong to this world."

The Nutcracker

It is Christmas Eve as we see the eccentric Herr Drosselmeyer putting the finishing touches on a special toy, a nutcracker doll in the form of a soldier, for his goddaughter, Clara. He arrives at her house and she is absolutely delighted with the gift, but unsure of his mysterious behavior. Clara falls asleep with her beloved nutcracker doll, but is frightened by the sounds of mice scurrying about. The figure of Drosselmeyer appears as if his magical powers were the controlling force of the fantasy to come. An enormous Mouse King appears and her nutcracker doll has become a soldier, battling the Mouse King.



Just at the point when all might be lost, good triumphs over evil. Clara saves the day by throwing her slipper at the Mouse, felling him in one blow and winning the battle. For this act of such devotion, Clara's nutcracker is transformed into a handsome prince. He invites her to accompany him through a magical snow-covered forest to the Kingdom of Sweets.

PAUSE

Angels guide the couple on their way to the Kingdom of Sweets. Upon their arrival at the court, they are greeted by the Sugar Plum Fairy and her Cavalier. Clara and the Nutcracker Prince tell of their adventure and the battle with the Mouse King. In honor of Clara's bravery, a grand divertissement of majestic entertainment is ordered. Dances from far-away countries will be performed: a chocolate dance from Spain, a coffee dance from Arabia, a tea dance from China, a traditional Russian dance, a dance of three sugar sticks played as flutes, Mother Ginger with her candy canes, a beautiful waltz of flowers, and a grand pas de deux with the Sugar Plum Fairy and her Cavalier.

As the whole court joins in a final waltz, the court begins to fade, despite Clara's desire that they remain with her. Had this been a little girl's fantasy or some magical reality created by the amazing Herr Drosselmeyer?

Cast of Characters in order of appearance:

Herr Drosselmeyer
Clara
Mouse King
Nutcracker Prince
Dance of the Snowflakes

(PAUSE)

Angels
Pages

Sugar Plum Fairy
Cavalier
Spanish Dance
Arabian Dance
Chinese Dance
Russian Dance
Dance of the Flutes
Mother Ginger
Candy Canes
Dewdrop
Waltz of the Flowers
Grand Pas De Deux of Sugar Plum Fairy and her Cavalier

About the Composer



Pyotr Ilyich Tchaikovsky was born in Votkinsk, Russia, in 1840, the second son of Il'ya and Aleksandra Tchaikovsky. By the age of six, he could read not only Russian, but also French and German. After hearing a piece by Mozart played on a music box, he asked his parents for piano lessons. The piano upset his nerves, though. The music going through his mind kept him awake at night.

When Tchaikovsky was ten, his mother took him to St. Petersburg, to a school that would prepare him to study law. He was very attached to his mother and had a hard time saying good-bye to her. Tchaikovsky's classmates described him as a good student who was well liked, though a bit absentminded. In 1854, Tchaikovsky's mother died.

Tchaikovsky began writing music while in school. One of his first pieces is called "Anastasya Waltz" and was named after a favorite governess from his childhood. While attending law school, Tchaikovsky also took singing and piano lessons. It is surprising that his music teachers did not recognize his talent.

Tchaikovsky graduated from law school in 1859 and got a job with the government. He was evidently a good worker but had much more fun after work going to the opera, ballet, and theater. In 1860, the Russian Musical Society started offering music classes to the public, and Tchaikovsky was one of their first students. He kept working for a while, but in 1862, when he was denied a promotion, he quit his job and enrolled as a full-time student at the St. Petersburg Conservatory. There he studied music theory, composition, flute, piano, and organ. When he graduated in 1865, he had learned everything he needed to be a good composer. Soon after his graduation from music school, he moved to Moscow to teach music theory at the Moscow Conservatory. This teaching position allowed Tchaikovsky to earn a living while he continued to compose music.



Money may have been one of the reasons why he married his friend Antonina Milyukova in 1877. He needed money, and she was going to receive an inheritance. Some people also say that Antonina threatened to kill herself if Tchaikovsky didn't marry her. After only nine weeks of marriage, though, it was Tchaikovsky who tried to kill himself by diving into an icy river. He and Antonia never lived together again, although they never officially go a divorce.

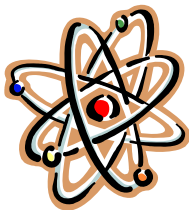
As it turned out, Tchaikovsky didn't need Antonina's money. A very rich widow, Nadezhda von Meck, loved Tchaikovsky's music and decided to send him a regular allowance. One condition for the allowance was that Tchaikovsky and von Meck would never meet each other. Instead, they wrote letters back and forth for fourteen years. They accidentally saw each other a few times but always turned and went the other way. For some reason, in 1890, they ended this relationship.

Tchaikovsky died in October of 1893. Some people believe he died from cholera after drinking unclean water. Others believe he poisoned himself because he thought he was going to be blackmailed. It is likely that no one will ever know for sure.

The Nutcracker is one of Tchaikovsky's most famous works. This ballet is performed thousands of times every winter holiday season. The engaging tunes from The Nutcracker have probably gotten more people interested in classical music and ballet than any other work.

Facts About Tchaikovsky

- Tchaikovsky wrote his first ballet, Swan Lake, in 1875.
- In 1891, Tchaikovsky conducted for the opening night of the concert season at Carnegie Hall in New York City.
- Tchaikovsky is well known for his symphonic music, which includes six symphonies, the 1812 Overture, and the overture to Romeo and Juliet.



Physics and Dance: A Brief Exploration

Dance, and in particular ballet, connects to a multitude of disciplines, spanning the curriculum. There is math in working with music, choreography and pattern of movement. There is language arts and storytelling in the performance of a work. There are history and social studies connections to be made with the historical context in which works were created or focusing on composers and famous dancers of the past. As you can see, the connections are there, a little research at the library or on the internet can unlock and create many activities for your classroom. In this packet, we are going to concentrate on a few areas in which physics and dance can be observed together in action, but this is only the beginning.

Physics and dance represent remarkably complementary approaches to human body movement - the scientific approach of classical mechanics, and the aesthetic approach of the popular art form of dance. People involved with dance, those having some familiarity with science, and those who might be unfamiliar with both topics can all find intriguing and challenging food for thought.

The science of physics deals with motion and interaction of forces and bodies. Many classroom experiments are available in which students use a variety of manipulatives to explore these forces and interactions, but they may also be explored while actively observing a ballet performance.

Balance

Balance can be defined as a condition in which the body is in stationary equilibrium without the tendency to topple due to the effect of gravity. Your students will see several examples during the ballet of dancers being *en pointe*, which means standing while balanced on the toes of one foot. This is an extremely difficult position in which to maintain balance and it only through practice and training that the effect is achieved.



For a person standing on two feet, in a “normal” standing position, the center of gravity is located in the abdominal region. This center is typically higher in the male body than the female body due to muscle mass distribution (men have it higher, women lower). If a person extends



his or her leg out to the side, back or front, part of the mass of the rest of the body must be displaced to maintain balance. This displacing of mass may cause a person to lean in the opposite direction of the extended leg. When a dancer is *en pointe*, the center of gravity must be in a vertical line above the toe position (see image at left). The dancer in the diagram is in a position known as *arabesque*. You can see that for the dancer to maintain her balance, arm and leg position, as well as torso position are used to hold the center of gravity in place. If the center of gravity is not in line, the dancer will topple. The more out of line the center of gravity, the faster the toppling will occur.

It is not uncommon for a dancer to find herself off-balance in a practice session. The body usually corrects itself in order to once again achieve a state of balance. However, from time to time a dancer may topple. This is why practice and training are so important. It is one thing to fall in a practice, it is another to do so in front of an audience!

Other things to look for during a ballet are dancers who may even hop while *en pointe* or when performing a pirouette – a complete turn of the body while on one foot.

In the Classroom

A simple experiment can be done in the classroom to demonstrate how the body automatically corrects for an off-balance situation. Have a student stand with his or her back to either the teacher or another student. Tell the student to imagine that he or she is on the edge of a table and certainly doesn't want to fall off. Let the student know that you or another student will gently push them on the back. Tell the other students to watch what happens as the student's body fights to maintain balance. Perform push. Some students will take a step forward to regain their balance. If the student were truly on a table, over they would have gone! However, other students may bend their body forward at the waist and even move their arms in a windmill-like fashion. This is the body's attempt to compensate for a sudden shift (the push) in balance.

There are 3 single elements that affect movements for dancers . There is ALIGNMENT of the body. Practice your body alignment with stationary balances, weight shifts or transfers (from 2 legs to 1 and back again) Try tilting the upper body forward or backwards. Incorporate a circling motion of one leg on the floor or in the air.

There is FORCE, the amount of push or pull . Newton's 3rd law – to every action or force applied there is equal or opposite reaction. A dancer is drawn to the floor by gravity and the floor exerts equal or opposite force against the dancer.

There is FRICTION. Try simple steps wearing shoes with different types of soles, try one foot with a sock and go barefoot on the other.

Motion

Acceleration from Rest

When a dancer begins to move, there is also physics involved in the process. In order for a motionless dancer to begin to move, or accelerate, they must move one leg forward while exerting a backward force on the foot remaining in place. This can easily be demonstrated by having students pay attention to the way they begin to walk from a still position. At the same time a foot moves forward, a backward force is applied to the foot remaining still. This process is repeated over and over and allows us to walk. In the case of a dancer, the process can be even more dramatic by increasing the force with each motion and gaining momentum.

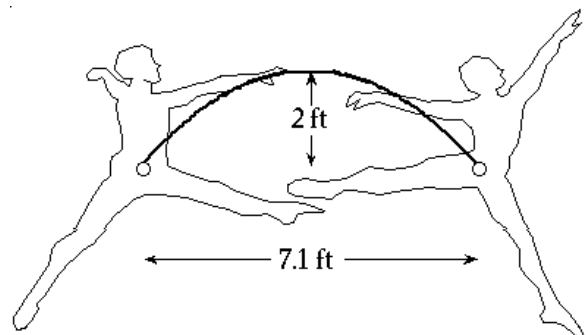
Motion in a Curved Path

The term acceleration not only refers to a change in speed, but also a change in direction of motion. One such change in direction often used in ballet is motion in a circular path. As a dancer travels around the stage in a circular path, there is a force on the body as the dancer pushes off the floor which is directed toward the center of the circle. This force causes a constant change in motion which allows the dancer to travel on the curved path. The dancer will also lean toward the center of their circular path as they travel. This lean will prevent the dancer from leaving the circular path.

Jumps

All jumps involve vertical acceleration and forces. In order for a dancer to jump, they must exert a force downward, against the floor, which is greater than their weight. To increase the force created by a dancer, many vertical jumps begin from the plié position, or from a position with bent legs. The motion leading into a jump is important also. A jump from a plié at rest position is less effective than a jump moving into and out of the plié in one smooth motion.

Jumps can also be performed with horizontal motion. These moves produce trajectories, or paths of motion through space. Many forces come into play here including friction and gravity. Once the dancer loses contact with the floor, the dancer's center of gravity will follow a parabolic trajectory, or curved path, that is determined by the conditions of motion at the beginning of the jump. The dancer may change the shape and configuration of the body while in flight, but the path will remain the same. The path will be a combination of a motion rising with decreasing speed, an instant with no vertical speed and finally an accelerated downward motion. This is shown in the diagram. The arc shown by the black line is the parabolic path of the jump. You can also see that the dancer only jumped two feet vertically, but traveled over seven feet horizontally.



The effectiveness of jumps also depends on the strength, height and weight of the dancers performing them. For example, in vertical jumps with a partner, a shorter dancer might have a harder time jumping high enough to fill the time if the music is of a slow tempo. However, a taller dancer's attempt might not be as impressive since the audience sees the height of a jump as compared to the dancers overall height.

In the Classroom

Projectile motion: Leaping dancers are cannonballs!

Demonstration: Stand in front of the classroom tossing a soft ball (tennis, beach) across the room. Have students describe the shape of the path of the ball- a parabola. Use this demonstration to discuss the path of projectiles and the relationship between free flying objects in motion and gravity.

Were it not for the force of gravity, when we jump up, we would keep moving up in a straight path.

When dancers leap, they are following the same type of path, a projectile. One other characteristic of a projectile is that the vertical velocity that the object moves approaches zero at the top of the projectile path and then accelerates once it/ he/ she begins to descend.

The PLIE (the bend that takes place before the jump) is critical in applying a force against the floor that is greater than the dancers own body weight. The FORCE generated by the soles of the feet against the floor is not enough. Try jumping from a straight leg. The PLIE must be enough to create sufficient acceleration to cause the dancer's body to become airborne. Too great a bend can make the jump less productive. Another factor affecting the dancer's jump is the ankle's range of motion and for the ballet dancer use of the turned out position also diminishes the force a bit. All jumps have a vertical acceleration, but leaps also must have horizontal acceleration. This is acquired through FRICTION.

How do dancers turn?

Much of the dancer's ability to turn is balancing and body ALIGNMENT. With the addition of torque, the twisting/ angular FORCE, the dancer can cause their body to rotate a few times on one leg. Larger preparations provide more torque than small ones (from 5th position) because the legs are further away from the rotational axis and generate more FORCE. Preparations that are smaller, however, enable the dancer to find body ALIGNMENT more easily by lesser shifting of the weight from 2 legs to 1. Single leg preparations happen with less FRICTION available to help generate force but allow for minimal weight shift change.

Partnering with Lifts and Turns

Partnering is another very important part of ballet and many types of dance. Partners add an entirely new aspect to dance. There must be a sense of trust between the partners especially when performing lifts and turns.

Turns

One move that is performed in many ballets and is part of many of the pas de deux, or dances for two, sections of these works is the supported pirouette. A dancer is en pointe, and turns with the help of a partner. An experienced ballerina will perform this move in as close to a balanced position as possible. This way, the partner only needs to apply subtle forces as he assists her in turning. Again, this is where training and experience come into play. If a dancer is off balance and the partner overcompensates, the result will be falling out of position. In the same way, if the dancer en pointe attempts to



regain her own balance while the partner applies his own force to correct the situation, another loss of position will occur. In any partnered turn, controlling both the balance and the rate of turn requires the cooperation of both partners.

Lifts



Lifts are another dramatic act performed by partners, often during a pas de deux. Lifts allow dancers to achieve greater height and duration of movement than can be achieved by a single dancer.

In a straight lift, one dancer (usually a male) lifts another dancer by his hands at her waist. Even though this is a simple lift, there are many considerations that must go into this motion as well. It would seem that the smaller the dancer being lifted, the easier it is for the one lifting. However, the smaller dancer must bend lower in preparation of the movement and lifting a person is much more difficult when a lift must start close to the floor. Also, the lifting partner does not do all of the work. The partner being lifted must also jump to assist in the process. Through training, dancers gain valuable experience in preparation and timing of these moves.

Overhead lifts are much more dramatic and impressive to audiences than the simpler front lifts, but the danger is also much greater. A flawed overhead lift may result in injury to both dancers. In all of these lifts, the dancers must trust one another and work together to achieve the desired effect. If hand positions are not just right by the lifting partner, the result could be the loss of control of the lift. The partner being lifted can also adjust her position to some degree to help control her center of gravity relative to the supporting hands of the lifting partner.

In the Classroom

Support base:

Below is a compilation of physical exercises that will help students understand and appreciate the skills of the performers. These activities should be done in a safe, opened area in small groups of 2-3 students. These exercises could be conducted during a gym class. Demonstrate and/or have students work through this progression of movements first attempting them with the support of a partner- holding the hand or shoulder.

For objects or people to maintain balance/ stability the center of gravity must be located over the base of support otherwise they will topple. Our center of gravity is somewhere behind our navel. In working through this sequence of exercises students should be able to detect better stability when holding onto a partner which enlarges their support base. When they do the same exercise without holding onto a partner, point out to them that the base of support is greatly reduced and for them to be able their center of gravity must be directly above their area of contact with the floor (feet, foot, toes.) Discuss with them adjustments they had to make to maintain balance- what were they doing with their CG.

Activity:

- Standing on two feet
- Standing on one foot
- Standing on one foot with the other extended forward
- Standing on one foot with the other extended backward
- Standing **balanced** on toe/ balls of the foot (the purpose is not to be on the tip of the toe but to balance on a smaller support base than the entire foot)

- Standing on the ball of the foot with the other extended forward
- Standing on the ball of the foot with the other extended backward
- Turn forward on one foot
- Turn backwards on one foot

Going Further

We only touched on a few examples of the partnership between physics and dance. There are many other areas in which these two seemingly different disciplines are interrelated. For further exploration, we recommend these resources both for the further exploration of dance and physics as well as *The Nutcracker*.

The Physics of Dance

Physics, Dance and the Pas de Deux

By Kenneth Laws and Cynthia Harvey

Schirmer Books/McMillan Publishing, New York. 1994.

To find out more on The Physics of Dance, GOOGLE “dance physics” for many available sites with additional information.

The Nutcracker Ballet

The Story of the Nutcracker Ballet by Diane Goode

The Nutcracker by Jane B. Mason

Woodland Nutcracker by Avril Tyrrell

The Nutcracker by Daniel Walden

General Ballet

The Illustrated Book of Ballet Stories by Barbara Newman

Of Swans, Sugarplums, and Satin Slippers by Violette Verdy

Ballet School by Naia Bray-Moffat

Dance Me a Story: Twelve Tales from the Classic Ballets by Jane Rosenberg





Content Standards and Objectives for the Science of Dance/Ballet

Note: Below are the CSO's for grades kindergarten through sixth grade.

Science Subject Matter/Concepts Objectives
Students will:

Position and Motion of Objects

SC.O.K.2.09 explore and state different ways objects can be moved(e.g.,straight, circular, fast, slow).

Unifying Themes Objectives

Students will:

SC.O.1.3.01 identify that systems are made of parts that interact with one another.

Science Subject Matter/Concepts Objectives

Students will:

Position and Motion of Objects

SC.O. 1.2.12 describe the changes in the motion of objects (e.g.,slowing, speeding up, curving).

Science Subject Matter/Concepts Objectives

Students will:

Position and Motion of Objects

SC.O. 2.2.10 compare the effects of force on the motion of an object.

Scientific Design and Application Objectives

Students will:

SC.O. 2.3.04 recognize that common objects and events incorporate science (e.g., CD players, Velcro, or weather) to solve human problems and enhance the quality of life.

History and the Nature of Science Objectives

Students will:

SC.O. 3.1.03 explore science careers in the community.

Science Subject Matter/Concepts Objectives

Students will:

Position and Motion of Objects

SC.O.3.2.11 recognize that it takes work to move objects over a distance.

SC.O.3.2.12 examine the relationships between speed, distance, and time.

SC.O.3.2.13 recognize that the greater a force is exerted on an object, the greater the change of its motion.

SC.O.3.2.14 identify examples of potential and kinetic energy.

Science Subject Matter/Concepts Objectives

Students will:

Position and Motion of Objects

SC.O.4.4.21 relate motion of an object to its frame of reference.

SC.O.4.4.22 predict and investigate the motion of an object if the applied force is changed.

Science Subject Matter/Concepts Objectives

Students will:

SC.O.5.2.01 demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.

Structure and Function in Living Systems

Position and Motion of Objects

SC.O.5.2.16 describe how the variables of gravity and friction affect the motion of objects.

Motion and Forces

SC.O.6.2.20 correlate the relationship of mass to gravitational force (e.g., larger the mass the larger the gravitational force, the closer the objects the stronger the force).

SC.O.6.3.05 research everyday applications and interactions of science and technology.

SC.O.7.3.07 explore the connections between science, technology, society and career opportunities.

Note: Watching this performance may be used to augment the curriculum standards for grades seven through twelve.

Content Standards and Objectives for Dance/Ballet

Note: Below are the CSO's for Levels I and II (grades nine through twelve.)

Dance Subject Matter/Concepts Objectives

Dance Communication

Students will:

D.O.LI.1.02 recognize and communicate abstract ideas through movement.

D.O.LI.1.03 identify and conclude the distinguishing moment when movement becomes dance (when movement takes on purpose and intent it becomes dance)

Dance Subject Matter/Concepts Objectives

Movement, Elements, and Skills

Students will:

D.O.LI.2.03 understand rhythm and timing as it relates to movement

D.O.LII.2.05 Articulate the importance of projection while performing dance skills.

Dance Subject Matter/Concepts Objectives

Healthy Living

Students will:

- D.O.LI.3.03 identify lifestyle choices and their affect on the dancer.
- D.O.LII.3.02 Describe how specific lifestyle choices affect the dancer.
- D.O.LII.3.03 Research historical and cultural images of the body as it relates to dance.

Dance Subject Matter/ Concepts Objectives

Culture and Historical Periods

Students will:

- D.O.LI.4 examine and demonstrate dance from cultures and historical periods.
 - D.O.LI.4.02 identify the four dance forms and give examples of each.
 - D.O.LI.4.03 research and answer questions about dance and dancers prior to the twentieth century.
 - D.O.LI.4.04 discuss dance and dancers as perceived in contemporary media when compared to other time periods and cultures.
- D.O.LII.4.03 answer questions about dance and dancers within the twentieth century.
- D.O.LII.4.04 research and analyze how dance and dancers are perceived in contemporary media when compared to other time periods and cultures.

Dance Subject Matter/Concepts Objectives

Connections with Other Disciplines

Students will:

- D.O.LI.7 Connect dance to other disciplines
 - D.O.LI.7.03 Identify and discuss commonalities and differences between dance and other disciplines with regard to fundamental concepts such as materials, elements and ways of communicating meaning.
- D.O.LII.7 Connect dance to other disciplines

Dance Subject Matter/Concepts Objectives

Students will:

Critical and Creative Thinking Skills

- D.S.LI.5 employ critical and creative thinking skills in dance.
- D.S.LII.5 employ critical and creative thinking skills in dance.
- D.O.LII.5.03 formulate and answer aesthetic questions based on a performance.

Note: Watching this performance may be used to augment the curriculum standards for grades seven through twelve or higher levels.

Glossary

Ballet Terms

Choreographer	Person who creates the steps and the dances for the ballet. Sometimes they also create the story, idea, or the mood of the ballet.
Composer	Person who writes the music. Some famous ballet composers are Tchaikovsky, Minkus, Delibes, Adam, and Stravinsky
Corps de Ballets	Refers to the group and ensemble dancers that create beautiful formations and designs, often performed around a soloist dancer. Sometimes the function of the corps de ballet is purely decorative, embellishing yet not distracting from the principal dancers. In a story ballet, their reaction with appropriate emotions enhance and help define the dramatic situation. To execute these movements in unison takes a lot of rehearsal for the dancers to really learn the steps, the directions, and to hear the musicality the same way.
Jete	In French, it means "to throw". For use as a ballet term, it means a jump throwing your weight from one leg to the other. It can be in a very small form such as a petite jete or a big leap that is called a grand jete.
Pas De Deux	In French, it means "step of two or dance for two". For use in ballet, it usually refers to the adagio that the principal man and woman dancer does together. His support of her movements enables her to do more turns, hold her balance longer in poses, and his lifts add spectacular movements to the dance.
Plie	Pronounced <i>plee ay</i> . The bend of the knees and ankles. Originates from the French verb plier "to bend"
Pirouette	A general term used to describe turns on one leg. <i>i.e. pirouette en dedans or pirouette en dehors</i>
Staging	Person who arranges a traditional ballet like Swan Lake, Sleeping Beauty, or Nutcracker to suite a particular company or dancer. They make slight adjustments to the order of dances, steps, or sequences of movements. Sometimes this includes modifications to choreography, music, sets, and costuming.

Physics Terms

Acceleration	Rate of change in velocity.
Center of Gravity	Point at which gravitational force on a body may be considered to act.

Force	The magnitude and direction of “push” or “pull.” The total of the forces acting on a body determines its rate of change of momentum.
Mass	The inertial resistance to a change in linear motion. A large mass will accelerate less than a small mass in response to a particular force.
Momentum	A quantity of motion, equal to the product of mass and the velocity of a body.
Speed	The magnitude of velocity, ignoring direction
Velocity	Rate of change of position with magnitude and direction both specified. Velocity and speed are often used interchangeably.

The Charleston Ballet and Avampato Discovery Museum would like to thank you for taking part in our programming this year. We hope to see you again soon. For information on future Ballet and Museum programs, feel free to call us or check us out online:

Charleston Ballet: (304) 342-6541
www.thecharlestonballet.com

The Clay Center: (304) 561-3500
www.theclaycenter.org

*This CD was funded by grants from **The McGee Foundation and
The Katharine B. Tierney Charitable Foundation***