

Newton's Laws of Motion and the Limón Technique

Topic, or Concept, and Goal (if the lesson is part of a learning experience or a unit plan)

Utilizing Newton's 3rd Law of Motion in Modern Dance – The Limón Technique

Grade

Class/Lesson Number

Grades: 6-8

State Dance and/or Physical Education (Dance Arts) Standards 2020

Virginia Standards - Science

Force, Motion, and Energy

6.2 The student will investigate and understand basic sources of energy, their origins, transformations, and uses.

National Dance Society *National Dance Education Standards Framework*

Strand(s) 6

Standard(s) 6.2 Dance, arts, and media literacy in interdisciplinary learning

Performance Indicator (6-8) Design a dance study and explain how parts of the study illustrate the steps in a math, science, or another discipline process

Learner Objectives or Outcomes (must include one "real world" objective or outcome for assessment)

Psychomotor: The student will feel and understand the physical response by lending the body weight to gravity as opposed to placing the body in a specific shape.

Cognitive: The student will understand that the Limón technique is based in Newton's Third Law of Motion: For every action there is an equal and opposite reaction.

Affective: The student will respond to other students dance studies by providing feedback through description of the movement; analyzing how it is constructed by sections or choreographic devices; interpreting the intent of the choreographer or determine what the choreographer is trying to communicate; and finally establishing the value of the work by its artistic merit or if the choreographers succeeded in both constructing a work that is aesthetically pleasing or communicated the intent of the work.

Rubric	Exceptional (4)	Accomplished (3)	Developing (2)	Beginning (1)
Psychomotor	The student fully understands and demonstrates the use of weight and gravity to implement the movements in the Limón Technique of Fall and Recover. Knees track over the toes in both parallel and turned-out positions in plié.	The student shows an understanding of utilizing weight and gravity to generate movement. Generally, always fully executes the movement. Almost always executes proper alignment in parallel or turned-out in plié.	The student cannot always demonstrate the use of weight and gravity to generate movement. Does not always fully execute the movement. Does not always execute proper alignment in parallel or turned-out in plié.	The student is unable to demonstrate the use of weight and gravity to generate movement. Does not maintain proper alignment in parallel or turned-out positions in plié.
Notes: I am looking for this movement quality in the drop-swings, leg swings, and plié combinations				
Cognitive	The student is capable of analyzing Newton's Third Law of Motion and applying it to movement qualities such as swinging and swaying in the "free fall" or "Fall and Recover" technique. The student can further demonstrate the "suspension" before the "free fall."	The student is somewhat capable of analyzing Newton's Third Law of Motion and applying it to movement qualities and Limón Technique. The student sometimes demonstrates the "suspension" before the "free fall."	The student demonstrates some understanding of Newton's Third Law of Motion but is not always capable of analyzing and applying it to movement. The student is not always able to demonstrate "suspension" before the "free fall."	The student is not able to demonstrate an understanding of Newton's Third Law of Motion or capable of analyzing and applying it to movement. The student cannot demonstrate "suspension" before the "free fall."
Notes: Newton's Third Law of Motion: with every action there is an equal and opposite reaction. I use the example of a roller coaster ride to demonstrate the suspension before a fall. I use the ride of DaVinci's Cradle at Busch Gardens to give the image of Newton's Third Law of Motion.				

Affective or social and emotional learning	The student is able to always respond appropriately to other students work and analyze the work by utilizing the critique process in a unique and mature fashion. Student digs deeply into the value of the work in terms of depth and complexity.	The student is able to sometimes respond appropriately to other students work and analyze the work by utilizing the critique process. Their responses are not always deeply or well thought out.	The student does not always respond appropriately to other students work. The analysis of the process is generally weak and not well thought out.	The student does not respond appropriately to other students work. The analysis of the process is not complete.
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Materials, Resources, Space Requirements, and Suggested Music

Materials: Blank form of the Critique Process:
Resources: <https://thesecondprinciple.com/instructional-design/threedomainsoflearning/>
References:
McCutchen, B. 2006. *Teaching Dance as Art in Education*. Champaign, IL: Human Kinetics.

Vocabulary terms (with definitions—see NDS *National Dance Education Standards Framework Glossary* for additional vocabulary terms.)

Fall and Recovery – part of the Limón terminology that refers to the body free falling in response to gravity and then rebounding in the opposite direction in alignment with Newton’s Third Law of Motion; for every action there is an equal and opposite reaction.

Apollo and Dionysian – a way of giving visualization to the terminology “Fall and “Recovery” by referring to the Greek gods, Apollo and Dionysus and their particular attributes. Apollo, who is strong and powerful, relates to the moment before the “fall,” and the “recovery” by coming back in control of oneself; while Dionysus, goddess of wine, is out-of-control and resembles the moment of falling and lending one’s control to gravity.

Weightiness – a feeling of heaviness or sinking of one’s weight into the floor; grounded.
Free Fall – releasing the control of a body part and allowing gravity to pull it towards the floor or earth (i.e., torso and head for a forward fall (Drop Swing) in the sagittal or frontal plane, or the thigh releasing on and attitude leg swing)

Suspension – the moment before the fall when the body part or full body suspends momentarily (i.e., like a roller coaster at the height before plunging to the bottom)

Tracking – making sure that the body remains in proper bodily alignment; in particular that while in parallel or turned-out positions, the center of the knee (patella) travels straight forward down

the shin and generally over the second or third toe while the knees bend in plié or in a turned-out position the knees do not come forward in front of the feet.

Turned-out – an external rotation that originates with the femur in the hip socket that continues through the lower leg and feet.

Parallel – an internal rotation that originates with the femur in the hip socket that continues through the lower leg and feet so that the feet are facing straight forward similar to railroad tracks.

High Release – a subtle lift of the upper torso so that the face lifts upward as well. Anatomically the trapezius is contracting while the pectoralis major is elongating, keeping the back of the neck long.

“C” curve – a forward flexion of the spine with the knees bent, keeping the image of going over a ball, to resemble the letter “C.” The upper arms and elbows can lift *in the sagittal plane as well to aid the image.

Side-curve – a lateral flexion of the spine with the knees straight or bent, leading with the head so it is hanging heavily in Limón Technique.

Dance Lesson Instruction:

The **dance lesson instruction sequence** includes **Introduction** or **Warm-up** (time), **Exploratory Experiences** (time), **New Material** (time), **Recap of Learning** (summary) and **Cool Down** (time), **Closure** (time), and **Assessment** (time). Timing of each dance lesson plan section is determined by the teacher.

Each of these instructional topics **may** require **management** (diagrams), **transition** (between each lesson component place and content), **teaching process** (the how), and **teaching points or cues** (technique or music).

Teacher’s pre-assessment of the students in class, continued observation and assessment throughout the dance instruction sequence.

Introduction/Warmup (20-25 minutes)

Management: *Rolling Down the Spine* – two demi pliés, drop the chin to the chest and roll down, one vertebra at a time until fully creased in the hip joint. Two demi plié, unroll up the spine. Elevé. Arms float up to a “open” high 5th position. Open the chest to “High Release.” Center the torso and then plié. Perform in parallel 1st, turned-out 1st, parallel 2nd, and turned-out 2nd.

Teaching Process: Modern dance is generally performed in bare feet. However, based upon your classroom and teaching situation, you might need to adjust accordingly.

Use the weight of the head to act as traction on the spine to open the spaces between each vertebra to re-align the spine.

Teaching Points or Cues: Heavy head, heavy arms. Hold in the abdominals. Make sure knees are tracking over the toes.

Management: *Feet* – in parallel and turned-out 1st

Forced arch, full, forced arch, close into position in 4 counts, 2 counts, and twice in 1 count.

Arms in Cecchetti 1st for parallel 1st, arms in 2nd for turned-out 1st.

Teaching Process: Do not allow the foot to roll to the outside of the ankle (sickled).

Teaching Points or Cues: Push the toes against the floor, peel the foot off the floor.

Management: *Drop Swings in Sagittal Plane* – in hip-width parallel. Breathe in, allow the arms to float up to an “open” high 5th position. Leading with the top of the head, allow the torso to free fall. The torso will rebound off of the thighs and come back to a vertical posture. On the third drop-swing, allow the arms to circle backwards and scoop up to high release.

Teaching Process: Since the students are in hip-width parallel position, the tendency is for the knees to roll-in. Also, from the momentum up into the High Release, the students will sometimes pop out the rib cage.

The swing can also be performed in the Frontal Plane – hang forward and let the torso swing right then left, then over the top through high release.

In the Horizontal Plane – in turned-out 2nd. Allow the arms to open to the sides, spiral the body to the right and wrap into a curve. The legs will change to a parallel lunge in plié. Repeat to the left. You can add a roll to the floor on the third curve.

Teaching Points or Cues: Repeat combo as many times until you feel they have the weightiness in the movement and are really lending their weight to gravity to allow for the rebound. You can see when they are trying to control the movement.

Fall like the arms are like an elephant truck swaying heavily from side to side. You can also use the image of a pendulum clock like a Grandfather clock.

Management: *Leg Swings in turned-out attitude* – arms in 2nd position

Start with the leg in attitude derriere, let the leg drop through turned-out 1st and swing to attitude devant. Repeat through count 7 and step forward on count 8, lifting the left leg to attitude derriere. Repeat on 4 counts and then twice on 2 counts.

Transition: To increase the difficulty, you can add half turns and torso pendulum swings on the turns.

Teaching Process: Pull down on the trapezius in the back and lift the triceps to hold the arms and add stability and to lift the torso in the pendulum swings.

Management: *Brush to forward curve, side curve and High Release*

Starting in turned out 1st position, brush the right leg forward degagé, arms swing out to side, fall to forward curve, legs in a front turned-out lunge, arms will naturally fall into a crossed position in front of the torso, push off from the lunge to return to vertical.

The arms continue to drop open and close; repeat to side degagé, side lunge, side-curve and back degagé, back leg bends, front leg straight, with high release.

Teaching Process: In the forward curve, maintain the “c” curve; in the side curve, keep the body facing flat to the front, support the head in the High Release to the back.

Teaching Points or Cues: Lead with the “top” of the head. Let the weight of the arms just fall. Do not “place” the arms in any position.

Exploratory Experiences (5-10 minutes)

Management: Diamonds- have students stand in groups of four, in a diamond shape. Each student will act as a leader of movement as the group follows. When the leader is finished, they will execute a ¼ turn in movement and the next leader takes over.

Teaching Process: Stay true to your facing – front person faces front, side right person faces side right, back person faces back, and side left person faces left. This occurs from the ¼ turn to the right

Teaching Points or Cues: Smooth transition from one leader to the next by completing their movement phase seamlessly into your own.

New Material (20 minutes)

Management: In small groups (4-5) students will develop their own movement study based in the ideas of Newton’ Laws of Motion.

Transition: Students will transition to their small groups and be given a space to works.

Recap of Learning and Cool Down (15-20 minutes)

Teaching Process: If only performing the Limón Technique, the lesson would continue with movement across the floor such as side-curve drags, chassé with a high release to a “C” curve in the sagittal plane.

Teaching Points or Cues: This lesson will take place over several classes and continue to grow in depth and complexity in both the Limón Technique and the development of their own Movement Study.

Closure and Assessment (time) (must include one “real world” assessment)

Management: See Rubric and review for informal assessment or use the rubric for formal formative assessment. Students will present their works in front of all the students. Students will give informal verbal feedback to their classmates. Students will either choose, or be assigned, which group, or their own group, that they will complete the Critique Process. Their own choreographic work will be graded based on the “Creative” rubric. Students will be given informal assessments as the teacher provides instruction and feedback during the Limón Technique class.

Extensions: (Interdisciplinary topics, special populations such as Gifted and Talented, inclusion of individuals with disabilities)

They can do further research on Newton’s other Laws of Motion and include that research into their Movement Study.

Lesson Reflection and Next Teaching Steps:

The technical portion of the lesson will continue to grow in both depth and complexity as we work through the technique. The Limón Technique tends to work well with students with little to no technical dance training. It is also more difficult for technically trained dancers to “let go” and allow their various body parts to “free fall” especially the arms. Once you have the concept of Fall and Recover, you can apply it to any type of movement to change the movement qualities.

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