

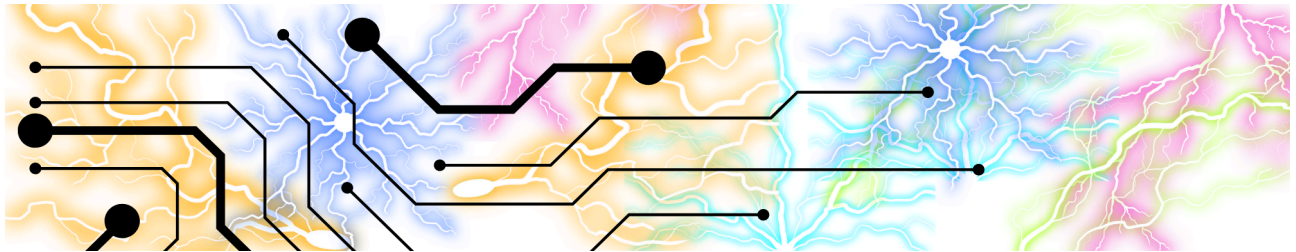
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Integrated learning solutions

ELECTRICITY IGNITES! MAY THE FORCE BE WITH YOU IMPROVISATIONS

Grade Band: 9-12

Content Focus: Theatre & Science



LEARNING DESCRIPTION

The room will buzz with movement as students put gravity and magnetic fields into their bodies while playing "Gravity Groove" and "Magnetic Field Milling". They will then explore the golden rule of improvisation, "Yes..and" by playing "You are a...Yes, I am". The lesson concludes with students creating improvised scenes with given Force of Nature Scenarios (Gravity, Magnetism, Electricity, Friction, Inertia). This challenging and hilarious lesson will catapult students' imaginations and get them out of their comfort zones.

LEARNING TARGETS

Essential Questions	"I Can" Statements
How can improvisation help me understand the forces of nature?	I can use my body to explore different aspects of electricity.
What is the difference between negating and accepting others' ideas?	I can use my imagination to learn about science.
How can I embody radical acceptance in my life and the world around me?	I can create stories with characters and dialogue to bring electricity to life. I can use improvisation to make stories about what I am learning in science.

	I can build upon others' ideas.
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GEORGIA STANDARDS

Curriculum Standards	Arts Standards
<p>Physical Science: SPS10 Obtain, evaluate, and communicate information to explain the properties of and relationships between electricity and magnetism.</p> <p><i>Additional Science standards that can be taught using these theatre strategies:</i></p> <p>Human Anatomy & Physiology: SAP4. Obtain, evaluate, and communicate information to analyze the processing of matter and energy in the cardiovascular, respiratory, digestive and urinary systems.</p> <p>Physics: SP1. Obtain, evaluate, and communicate information about the relationship between distance, displacement, speed, velocity, and acceleration as functions of time.</p> <p>SP2. Obtain, evaluate, and communicate information about how forces affect the motion of objects.</p> <p>SP3. Obtain, evaluate, and communicate information about the importance of conservation laws for mechanical energy and linear momentum in predicting the behavior of physical systems.</p> <p>SP4. Obtain, evaluate, and communicate information about the properties and applications of waves.</p>	<p>TAHSFT.CR.1 Organize, design, and refine theatrical work.</p> <p>b. Incorporate dramatic elements through improvisation.</p> <p>TAHSFT.PR.1 Act by communicating and sustaining roles in formal and informal environments.</p> <p>a. Observe and demonstrate aspects of verbal and non-verbal techniques in common human activity for performance (e.g. voice, breathing, posture, facial expression, physical movement).</p>

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
<p>Physics: P-PS2-3. Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the effect of a force on a macroscopic object during a collision</p> <p>P-PS2-5. Plan and conduct an investigation to provide evidence that an electric current can</p>	<p>Anchor Standard 1: I can create scenes and write scripts using story elements and structure.</p> <p>Anchor Standard 3: I can act in improvised scenes and written scripts.</p>

produce a magnetic field and that a changing magnetic field can produce an electric current.

P-PS3-5. Develop and use a model to illustrate the forces between two objects and the changes in energy of the objects due to their interaction through electric or magnetic fields.

Additional Science standards that can be taught using these theatre strategies:

Biology:

B-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.

B-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

Earth & Space Science:

E-ESS1-4. Use mathematical or computational representations to predict the motion of orbiting objects in the universe due to gravity.

E-ESS2-1. Use evidence to argue how Earth's internal and external processes operate to form and modify continental and ocean-floor features throughout Earth's history.

E-ESS2-3. Develop a model based on evidence of Earth's interior that describes cycling of matter through convection processes.

KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none">● <u>Attract</u> - When two objects pull toward each other due to magnetic or electric forces; opposite charges or poles attract (e.g., a north pole and a south pole of a magnet)● <u>Repel</u> - When two objects push away from each other due to magnetic or electric forces; like charges or poles repelling (e.g., two north poles of a magnet)	<ul style="list-style-type: none">● <u>Body</u> - Actors use their body to become a character through body posture and movement. What your mind thinks, what your emotions feel, all of this is supposed to show up in your body.● <u>Posture</u> - How an actor holds their shoulders and chest to portray a character's motivations, emotions, and traits.

- Positive (+) - A type of electric charge or magnetic property. It repels other positive charges and attracts negative charges.
- Negative (-) - A type of electric charge or magnetic property. It repels other negative charges and attracts positive charges.
- North Pole (N) - One of the two ends of a magnet where the magnetic force is the strongest
- South Pole (S) - The opposite end of a magnet where the magnetic force is the strongest
- Gravity - The force that pulls all objects with mass towards each other, causing things to fall to the ground and keeping planets in orbit
- Friction - A force that opposes motion when two surfaces come into contact
- Inertia - The tendency of an object to resist a change in motion; an object at rest stays at rest, and an object in motion stays in motion unless acted on by an outside force (Newton's First Law of Motion)
- Magnetism - The force that is created by the movement of tiny charged particles called electrons and causes some materials, like iron, to attract or repel each other
- Magnetic field - The invisible area around a magnet where the force of magnetism acts, attracting or repelling other magnets and magnetic materials like iron
- Imagination - Actors use their imagination to envision things that are not real. It is an essential tool in an actor's ability to bring a character, scene, etc. to life.
- Facial Expressions - Using your face to show emotion
- Improvisation - A moment in a play that is not rehearsed or "scripted", or acting without a script. For example: if an actor forgets a line, he/ she may improvise the line in the scene.
- Rules of Improvisation -
 1. Say "Yes, and..."
 - Always accept what your scene partner says or does.
 - Build on it by adding your own ideas instead of shutting theirs down.
 2. Avoid asking too many questions.
 - Instead of just asking, add information to keep the scene moving.
 3. Make bold choices and commit.
 - Don't be afraid to fully commit to your character and actions.
 - Even if something feels silly, own it!
 4. Keep the scene moving forward.
 - Scenes shouldn't stall—always contribute to the action.
 - If things slow down, introduce a new action, emotion, or obstacle.
 5. Stay in the moment.
 - Listen to your scene partners and respond genuinely.
 6. Make your partner look good.
 - Improv is about teamwork, not competition.
 - Support each other and help the scene succeed instead of trying to be the funniest.
 7. There are no mistakes, only opportunities.
 - If something unexpected happens, go with it!
 - Mistakes can lead to hilarious or creative moments in a scene.
 8. Keep it appropriate.

MATERIALS

- Positive/Negative cards—index cards with one word on each: Positive (+), negative (-) (one card per student)
- North/South cards—index cards with one word on each: North (N), South (S) (one card per student)
- [Rules of Improvisation](#)
- Force of Nature Scenarios for "May the Force Be With You" improvisations.
 - 1 - "Magnetic Mystery" (Magnetism, Electricity)
 - Scenario: A town is experiencing strange magnetic disturbances—cars, phones, and even metal trash cans are flying toward a mysterious magnetic field! A group of scientists must figure out what's causing it before everything metal disappears into the sky.
 - Forces in action:
 - Magnetism—students can act as metal objects being pulled toward an invisible force
 - Electricity—powering the magnet on/off to control the chaos
 - 2 - "Frenzy Friction" (Friction, Inertia)
 - Scenario: A group of skiers is competing in a downhill race, but as they reach the bottom, they realize the snow has melted into a super slippery ice patch! With almost no friction, they can't stop and must figure out how to slow down before crashing.
 - Forces in action:
 - Friction—acting out different surfaces: rough snow versus slick ice
 - Inertia—skiers keep moving unless something stops them
 - 3 - "Elevator Drop" (Electricity, Gravity)
 - Scenario: A group of people is in an elevator when the power goes out! Without electricity, the elevator stops moving. Then, the emergency backup kicks in, but gravity starts pulling it too fast. Can they figure out how to stop the elevator before it crashes?
 - Forces in action:
 - Electricity—powers the elevator, but it fails
 - Gravity—pulling it down when the power is lost
 - Friction—brakes activating to slow it down
 - 4 - "Rollin' Coaster" (Inertia, Friction, Gravity)
 - Scenario: A brand-new roller coaster malfunctions, and instead of slowing down at the end, it keeps speeding up! The riders must find a way to stop the ride before they launch off the tracks.
 - Forces in action:
 - Gravity—pulling the coaster down steep drops
 - Inertia—coaster keeps moving unless stopped
 - Friction—brakes trying to slow it down

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

EXTREME ZING! (Magnetism & Electricity)

- Explore the words attract and repel and how they look on our bodies.
 - Repel jumps away.
 - Attract comes together.
- Explore the words positive and negative and how they look with our bodies, faces, and voices.

- Positive - Tall body, high level that goes from small to big, face goes small to big, voice with pitch and volume that grows
- Negative - Small body, low level that goes from low to high, face from big to small, voice with pitch and volume that decrease
- Discuss how attract and repel relate to positive and negative charges.
 - Opposites attract.
 - Likes repel.
- Have students mill about the room.
- Tell students:
 - When I say "1, 2, 3...Action" you will mill about the room as your positive or negative character.
 - When I say "1, 2, 3...ZING!" you will freeze opposite the person/character closest to you.
 - Physically react to your partner/other character:
 - If they are opposites (+ and -) or (North and South), they must move toward each other (slow-motion magnetization).
 - If they are like charges (+ and +) or (North and North), they must dramatically push apart like an invisible force is pushing them.
 - I will then say "1, 2, 3...Action" and you will mill about the room again until I call out "1, 2, 3.. ZING".
- Give each student a positive/negative card and a north/south card.
- Keep playing for several rounds.
- Then, add the third action: Neutral!
 - Students freeze, representing an uncharged object.

GRAVITY GROOVE

- Discuss how gravity changes movement.
- Ask students to move around the room normally.
- Call out different gravity levels:
 - Zero gravity:
 - Students move in slow motion, floating like astronauts.
 - Moon gravity:
 - Students take big, slow steps, like walking on the Moon.
 - Extreme gravity:
 - Students act as if they are being pulled down with heavy weight.
 - Coaching note:
 - Encourage students to exaggerate their movements and facial expressions to tell a strong non-verbal story.

MAGNETIC FIELD MILLING

- Discuss the meaning of a magnetic field.
- Play music.
- Explain the game. Say:
 - When I play the music, you will walk around the room like a magnetic particle floating in space.
 - When I stop the music, I will call out a scenario.
 - You need to use your whole body, facial expression, and imagination to embody the scenario without words.
- Start the music. Asking questions as students mill about the space.
 - How would that feel in your body?
 - How would your legs react?
 - How would your arms react?
- Stop the music and call out a scenario:

- Strong magnet!
 - Students rush to the center of the room acting like a strong magnetic field pulling them in.
 - Coaching questions:
 - How would this change the pace of your movement?
 - How would the magnetic field pull you?
 - What part of your body would lead?
- Weak magnet!
 - Students lazily move in all directions showing a weak attraction.
 - Coaching questions:
 - How would this change the pace of your movement?
 - How would your face react?
 - What part of your body would lead?
 - How would your posture change?
- Magnet turned off!
 - Students collapse like the magnet lost power.
 - Coaching questions:
 - How would you fall to the ground?
 - Add a sound when you are turned off.

Work Session

IMPROVISATION

- Introduce the [Rules of Improvisation](#).
- Watch the video: [Minute Improv Yes And](#).
- GAME: "YOU ARE A....YES, AND I AM"
 - Have students get into partners around the room.
 - Partner #1 tells the other what character they are/have.
 - #1 says, "You are a _____."
 - #1 claps three times while Partner #2 becomes the character.
 - Partner #2 immediately physicalizes and embodies the character said to them.
 - Then says, after the claps, "Yes, I amand....I _____", adding in a detail and acting it out.
 - Partner #1 gives Partner #2 three character suggestions. Then, the partners switch.
 - Partner #2 gives Partner #1 three character suggestions.
 - Example:
 - #1 says, "You are a monkey" then claps three times.
 - #2 becomes a monkey with body, voice, and sounds.
 - #2 says, "YES, I am a monkey, AND I eat bananas!".
 - Repeat this twice and then switch.

MAY THE FORCE BE WITH YOU

- Say, "Now, let's practice and play with improvisation; let's make up scenes on our feet as we go along".
- Ask three student volunteers to come to the front of the room.
- Read the scenario: "Lost in Space" (Gravity, Inertia).
 - *A team of astronauts is on a spacewalk when their spaceship's gravity generator malfunctions! Suddenly, they are floating in zero gravity. A planet's gravitational pull pulls them in as they struggle to move. Can they escape before they get sucked into the atmosphere?*
 - Ask students which forces are at work. This scenario deals with gravity and inertia.
 - Ask students to explore ways that would look in their bodies in each scenario.
 - Gravity–weightlessness in space versus strong pull from a planet

- Inertia—astronauts floating in motion until they push off something
- Ask students to freeze in a pose as if they are floating in zero gravity.
- Call "Action" and have students come to life.
- Coaching notes as students improvise.
 - If a student negates something, ask them to repeat it with "Yes, and..."
 - Tell students:
 - Project your voice so that we can hear you.
 - Listen to your partner.
 - Build on what your partner is saying.
 - Bring in the focus of nature.
- When students are finished, call "Lights out."
- Have students bow.
- Ask the students in the audience what they thought each actor did well.
- Ask them what worked and didn't work about the dialogue.
- Assign groups of students a Force of Nature Scenario (Gravity, Magnetism, Electricity, Friction, Inertia).
 - Give students ten minutes to rehearse.
 - Have students share scenes.
 - Keep coaching as scenes are being performed to help direct the scenes if needed.

Closing/Reflection

- Say, "Improvisation is radical cooperation and acceptance. Why do you think people say that about improv?"
 - Have students turn and talk to a neighbor about the following:
 - Was improvisation easy or hard for you, and why?
 - Think about how saying "Yes...and" might change some of your school, home, and work relationships.

ASSESSMENTS

Formative

- Walk around the room and listen to collaboration to assess students' comprehension of the material.
- Observe students' understanding of improvisation and comfort level throughout the lesson.

Summative

- Assess students' content comprehension through the scenes that they create. Check to make sure they include the forces and create dialogue.

DIFFERENTIATION

Accelerated: Accelerated students can revise and edit their scripts. Then, type them out and create blocking to perform in front of the class. *Blocking is the physical arrangement of actors on a stage that facilitates the performance of a play.*

Remedial: The class can work as one team and develop a simple script for each scenario. Then, they can read them aloud in class.

ADDITIONAL RESOURCES

- [Minute Improv Video: Yes And](#)

This integrated lesson provides differentiated ideas and activities for educators that are aligned to a sampling of standards. Standards referenced at the time of publishing may differ based on each state's adoption of new standards.

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