

Force & Motion, Science & Dance 5-Day Residency with Sheila Kerrigan

A SAMPLE OF SCIENCE STANDARDS THAT CAN BE DANCED

- 2.P.1 Understand the relationship between sound and vibrating objects.
- 2.P.2 Understand properties of solids and liquids and the changes they undergo.
- 3.P.1 Understand motion and factors that affect motion.
- 3 & 4.P.2 Understand the structure and properties of matter before and after they undergo change [or interaction gr.4].
- 3.P.3 Recognize how energy can be transferred from one object to another.

- 4.P.1 Explain how various forces affect the motion of an object.
- 4.P.3 Recognize that energy takes various forms that may be grouped based on their interaction with matter.
- 4.E.1 Explain the causes of day and night and phases of the moon.

- 5.P.1 Understand force, motion and the relationship between them.
- 5.P.2 Understand the interactions of matter and energy and the changes that occur.

NC ELA SCoS CCR Standards

Anchor Standard RI.1 – Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. **Anchor Standard RI.2** – Determine central ideas (RI) or themes (RL) of a text and analyze their development; summarize the key supporting details and ideas.

2.3. Describe the connection between...scientific ideas or concepts...in a text. **3.3** Describe the relationship between...scientific ideas or concepts...using language that pertains to time, sequence, and cause/effect. **4.3** Explain events, procedures, ideas, or concepts in a...scientific text... **5.3** Explain the relationships or interactions between two or more...events...or concepts in a ...scientific...text....

NC ELA SCoS CCR Anchor Standard SL.1 – Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

DANCE STANDARDS

- 3-5.CP.1** Use choreographic principles, structures, and processes to create dances that communicate ideas, experiences, feelings, and images.
- 3-8.CP.1.3** Create dance movement sequences to represent words, ideas, experiences, stories, images, abstractions, and/or feelings.
- 3-8 CP.2** Understand how to use performance values (kinesthetic awareness, concentration, focus, and etiquette) to enhance dance performance.
- 3-8.R.1** Use a variety of thinking skills to analyze and evaluate dance.

SOME DANCE ELEMENTS

<p><u>Time</u></p>

Tempo
fast, slow
accelerating, decelerating

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Space

direct-indirect
locomotor-non-locomotor

Weight

strong
heavy, light

Flow

bound, free

SOME SCIENCE CONCEPTS K-4

EARTH in the UNIVERSE
EARTH/MOON/SUN SYSTEM
Relative Motion & Position
EARTH SYSTEMS
Cycling of Matter
Atmosphere

ENERGY

CONSERVATION & TRANSFER
Conduction Radiation
Convection Absorption
Scattering

TEMPERATURE
Expansion Contraction

ENERGY
Kinetic Potential Transformation Transference

SIMPLE MACHINES

MATTER

Elements
Heat
Pure Substances
Chemical Changes

FORCES & MOTION

Waves, Light, Sound
Electromagnetic Spectrum
Balanced & Unbalanced Forces
Position, Direction, Speed

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LESSON PLAN

N.B.: This residency takes place after students have been introduced to the Science concepts we will be exploring. They have been assigned the small groups they will work with.

Day One

Introduction

Who am I?

What will we be doing?

State and post goals.

Agree on guidelines for behavior and critical response process.

Warm up:

Personal space, internal focus, non-locomotor movement

Attend to your body: Experiment with rotation, inclination, translation, cross-body, stretch

Control Game with Elements of Dance

Personal space, internal focus, locomotor movement

Explore and combine **Dance elements and movement qualities:**

Time (fast-slow, accelerating-decelerating),

Space (direct-indirect, locomotor-non-locomotor),

Weight (strong, heavy-light),

Flow (bound-free).

Reflect

Look for connections between the vocabulary of dance and science.

Prepare for small group work

Teacher Reviews Science concept(s) we are exploring.

Explain group roles, hand out roles cards to each group.

Small Groups Assign Roles: facilitator, focus-keeper, note-taker, time-keeper, director/choreographer

1) Focus-keeper reads aloud the selected Science Standard and supplemental information.

2) Facilitator leads discussion: Do we understand the vocabulary? What does it mean?

3) Group does any needed research to clarify meaning.

4) Facilitator helps group agree on the meaning and explanation.

5) Note-taker writes down the meaning and explanation; hands it in.

Reflect

How did group work go? What have we learned so far?

What has someone done or said that you want to acknowledge?

Day Two

Introduction

Recall yesterday's work.

Look at goals.

Review guidelines: any changes?

Hand back meaning and explanation of scientific concept from Day One.

Warm up:

Personal space, internal focus, non-locomotor movement.

Attend to your body: stretch in various directions explore angles, diagonals, experiment with isometrics, explore force, potential energy.

Control Game with Forces and Motion

Personal space, internal focus, locomotor movement

Light & heavy, strong & weak, direct & indirect,

Explore relationship between force and speed

Partners test force and motion together

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In cooperative pairs, explore push-pull, lean, support, varying force and angles and speeds.
Some partners show one shape or repeated motion they invented.

Reflect

Analyze what you see in terms of force, angle, speed.

Whole Group Does Rounds on the Scientific concept in question

Go-round: one person gets up at a time and does a half-baked idea using dance elements to communicate the scientific principle. Everyone else watches silently and takes notes.

Reflect

Rounds Critical Response: you saw that you liked, how you might use it, expand it, connect it, etc.

Review steps and rules of round,

Hand out group roles cards, groups rotate roles.

Hand out cards with steps and rules to the focus-keeper of each group.

Small Groups do rounds on their scientific concept, exploring how to use dance elements to communicate the meaning of their concept.

Focus-Keeper makes sure they follow the steps and rules of rounds.

Facilitator leads discussion: what you saw that you liked, how you might use it, etc.

Director/choreographer decides how the group will communicate their scientific principle using dance elements, tells the group members what to do, rehearses them.

Facilitator leads discussion of what they did, what works, how to improve.

Note-taker writes down ideas.

Reflect

Group work?

Thoughts and questions about dance, science.

What has someone done or said that you want to acknowledge?

Day Three

Introduction

Review yesterday's work.

Check in with agreements, goals.

About the creative process—constantly improve, delve deeper, repeat.

Warm up

Personal space, internal focus, non-locomotor movement.

Variations on Force, push-pull, dance elements.

Control Game

Force variations, dance elements, energy variations & energy transfers

Partners

Explore energy transfers: light, electricity, heat, sound, magnetism

Some pairs show something they invented.

Groups

Review and rotate roles.

Review rules for rounds.

Group does a second round on their scientific concept, working to incorporate dance elements that relate to it.

Facilitator leads discussion: what you saw that you liked, how you might use it.

Director/choreographer decides how the group will communicate their scientific principle using dance elements, tells the group members what to do, rehearses them.

Facilitator leads discussion of what they did, yesterday & today, what works best, how to combine the best and improve.

Note-taker writes down the ideas.

Reflect

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How is it going? Group work? Questions?

What has someone done or said that you want to acknowledge?

Day Four

Introduction

Remember agreements, especially around critical response.

Warm up

Attend to your body: Experiment with rotation, inclination, translation, cross-body, stretch.

Control Game

Exploring elements of dance as they relate to science.

Partners

Play with forces together: electricity, magnetism, light, sound.

Some partners show something they discovered.

Groups

Rotate roles

Note-taker reads notes from yesterday's rehearsal & discussion.

Facilitator leads discussion of what they can change to be as clear as possible in their communication of their scientific principle, and which dance elements help communicate it.

Director decides what to do, tells others, rehearses group.

Groups

Show their work to another group, get and receive feedback. Note-takers write down feedback.

Reflect

What has someone done or said that you want to acknowledge?

Day Five

Warm up

Groups

Rotate Roles

Note-taker reads aloud feedback from yesterday.

Facilitator leads discussion of changes to make.

Director listens to the ideas, revises, rehearses.

Whole Group: Audience Etiquette: Attend, Applaud, Appreciate, Analyze

Groups show their dance pieces to whole class. Class discusses: What dance elements and qualities of movement do you see? What scientific concepts are they communicating to you?

After analysis, group says the summary of the meaning of their Science Standard.

Reflect, Affirm, Evaluate

What did we do & why did we do it?

What have we learned?

What has someone done or said that you want to acknowledge?