

Thematically Linked Integrated Item Set Dance

Task Administrator Information

Overview of Assessment Task

People who know about mathematics can appreciate that the content area has an “aesthetic” (a set of ideas about beauty and what is beautiful) of its own. Likewise, those who know about dance recognize that dance movements use many elements of mathematics, such as lines and angles. In this assessment task, students will be asked to apply their learning in these complementary content areas. They will be asked to:

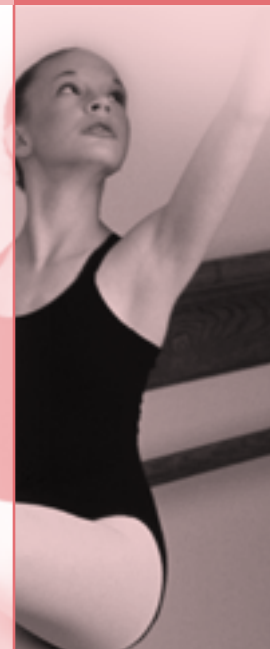
- Define a selection of mathematical (geometry) terms or concepts;
- Plan and execute a movement sequence that will be captured photographically and/or on videotape that kinesthetically conveys an understanding of the selected mathematical terms and concepts;
- Evaluate their own as well as a classmate’s choreography for this project; and
- Provide a written explanation of how their images contribute to students’ understanding of the mathematical concepts they have kinesthetically conveyed.

Recommended Instructional Context

This integrated, thematically linked item set may be administered to students in a variety of timeframes and instructional contexts. For example, teachers may:

- Administer the assessment to students enrolled in a grade 8 dance course at any point after they have provided instruction that addresses the grade 8 dance VSC objectives identified;
- Administer the assessment to students in the context of a physical education class at any time after a unit on dance that addresses the objectives identified below has been completed; or
- Administer the task as a team effort of dance and mathematics instruction.

This integrated, thematically linked item set may be used as either a formative or summative assessment. Depending on the course in which the task is introduced, one or more preliminary activities may be modeled as part of instruction leading up to the scorable evaluation activities. For example, teachers may wish to share with the class examples of books showing illustrations of dancers, decorative alphabets, and other relevant resources.



Voluntary State Curricula (VSC) Objectives Addressed (By Content Area)

Grade 8 Dance

- Objective 1.1.a: Analyze various dances to determine how the elements of dance are used to communicate meaning
- Objective 1.1.b: Incorporate the elements of dance to develop dances that interpret a variety of stimuli
- Objective 2.3.b: Analyze ways in which the knowledge, skills, and processes of other disciplines are related to those of dance
- Objective 2.3.c: Create and analyze movement sequences that demonstrate relationships between dance and other disciplines
- Objective 3.1.c: Create dances individually and in groups using the improvisational process
- Objective 3.2.b: Create dances by selecting and applying choreographic forms to communicate meaning
- Objective 3.2.d: Organize dances by combining elements, aesthetic principles, and choreographic forms
- Objective 3.3.a: Demonstrate consistent application of awareness of space, concentration, physical discipline, projection, and clarity in rehearsals and dance performances
- Objective 4.1.a: Critique dance performances using the elements of dance, aesthetic principles, choreographic forms, and performance competencies as criteria to determine aesthetic value
- Objective 4.1.e: Articulate rationales to explain conceptualizations, aesthetic decisions, and effectiveness of personal performances, improvisations, and choreography

Middle School Mathematics

Standard 2: Geometry

- Objective 2.A.1.a (Grade 6): Identify (and) describe points, lines, rays, vertices, angles, planes
- Objective 2.A.1.c (Grade 6): Identify and describe parts of circles (radius, diameter, circumference)
- Objective 2.A.2.b (Grade 7): Identify and describe vertices, adjacent, complementary, supplementary angles
- Objective 2.A.2.c (Grade 7): Identify and describe parts of right triangle, obtuse, acute, right angle
- Objective 2.A.1.b (Grade 8): Identify and describe the relationship among parts of a right angle
- Objective 2.A.2.b (Grade 8): Apply right angle concepts to solve real-world problems
- Objective 2.C.1.c (Grade 8): Construct triangles (congruent to a given triangle)

Grade 8 Reading/English Language Arts (Optional)

- Objective 4.3.A: Write to inform

Administration of Assessment Task

Task Title: The Geometry of Graceful Movement

Overarching Idea: Key concepts in geometry can be expressed through “kinesthetics” (the use of gestures and movements of the body for non-verbal communication).

Topic/Theme: Using Kinesthetics to Express Geometric Concepts

Materials/Equipment Needed:

For each student:

- Access to an array of simple props that may include:
 - A yardstick
 - A hoop
 - A long, sturdy jump rope (approximately 6 feet in length)

For the class:

- Copy of *Dance*, written by Bill T. Jones with photographs by Susan Kuklin (New York: Hyperion Books for Children, 1998)

NOTE: Lois Greenfield’s *Breaking Bounds* (pages 1, 14, 27, 28, 31, 40, 41) or *Airborne* (pages 11, 31, 39, 40, 44) may be used in addition to or if *Dance* is unavailable.

- A few sample “decorative alphabets” (books that present the alphabet using unusual forms such as flowers, tools, animals, or the human body); may be borrowed from any media center or public library
- A digital or conventional camera (digital is preferable) and/or video camera and videotapes

Suggested Timeframe:

Pre-assessment: One class period

Activities 1-4: One-two class periods

Activity 5: One class period to plan and rehearse, followed by the number of classes necessary for all students to perform (and observe classmates’ performances)

Activity 6: One class period

Activity 7: One class period (or part of one class period)

Background

In this task, students will first be introduced to a type of book called “decorative alphabets.” These books use plant forms, animal forms, or human forms, among others, to represent the letters of the alphabet. Other books similar to decorative alphabets that pictorially illustrate numbers, concrete objects, or abstract concepts may also be used.

Students will consider which mathematics terms and concepts are best illustrated by means of a single sustained movement and which call for continuous movement. They will also consider which concepts may be demonstrated solo and which require that students work with one or more other classmates.

This work will culminate in production of a movement sequence captured on videotape for purposes of evaluating proficiency in dance, and supplemented as necessary with still, photographic images (based on the mathematics concepts illustrated) which, together with the videotapes, could be used as teaching tools for students learning concepts of geometry.

Finally, students will evaluate their own as well as classmates’ choreography and performance for this project and write about the usefulness of the finished products to help other middle school students learn about mathematics.

Task Administrator Script

Directions

[NOTE: INSTRUCTIONS TO THE TASK ADMINISTRATOR APPEAR IN BOLD AND/OR CAPITAL LETTERS AND SHOULD NOT BE READ TO STUDENTS]

Pre-Assessment Activity

THE INTRODUCTION AND PRE-ASSESSMENT DIRECTIONS MAY BE ADMINISTERED ORALLY TO STUDENTS, IN WHICH CASE STUDENTS SHOULD BE PROVIDED WITH THE DIRECTIONS AND INSTRUCTED TO FOLLOW ALONG AS YOU READ ALOUD.

THE BOOK EXAMPLES MAY BE MADE AVAILABLE TO STUDENTS PRIOR TO THE BEGINNING OF THIS TASK. STUDENTS MAY BE INSTRUCTED TO PERUSE THEM ON THEIR OWN WITHIN A SET PERIOD OF TIME PRIOR TO THE START OF THIS TASK.

Dance is widely accepted as a form of communication, similar to a language. Like all languages, that of dance may be considered to have an “alphabet” of component parts that can be put together in different ways for different expressive purposes. Over the next few _____ (CLASS PERIODS/DAYS) you will be using the language of dance to create another type of “alphabet,” one that helps others to understand the area of mathematics called geometry.

The expressive nature of dance was captured as a photo essay in a book on dance aptly titled *Dance*, which was written by Bill T. Jones. As a modern dance choreographer, the author uses dance movements to introduce young children to his ideas about the purposes and potential of dance. Take a look at how he uses his body to show the ideas relayed in the text.

IF USING ONLY LOIS GREENFIELD BOOK or BOTH BOOKS: The expressive nature of dance was (also) captured in two books of photos by Lois Greenfield, titled *Breaking Bounds* and *Airborne*. The dancers are captured in action and often in the air. Their bodies show the relationship between geometry and dance. Take a look at the photos and see how many geometric concepts you can identify.

SHOW SAMPLE ILLUSTRATIONS FROM THE BOOK(S).

Just as these illustrations of a dancer help convey ideas about movement, the movements of the human form may also be used to convey other ideas and concepts. We can use the rich “vocabulary” of movement to convey mathematical concepts that are introduced to students through the study of geometry. A book that uses images of dancers in motion can help students learn, understand, and remember some key geometry concepts.

Using the human form to define or communicate images of an idea is not new. An example of this concept is seen in a traditional book art form, the decorative alphabet book. In such books, the letters of the alphabet are formed from other shapes such as flowers, machines, animals, and the human body in various positions.

Look at one or more decorative alphabets to see how letters are created out of unusual and imaginative forms. Then, with a partner, take turns, individually and together, making a few letters of the alphabet by moving your own bodies.

AFTER PROVIDING SUFFICIENT TIME FOR STUDENTS TO PRACTICE, THE TASK ADMINISTRATOR MAY INVITE STUDENTS TO SHARE SOME OF THEIR LETTER-FORM MOVEMENTS WITH THE WHOLE CLASS BEFORE CONTINUING WITH THE ASSESSMENT TASK.

Activity 1

No specific VSC match is indicated for Activity 1. (This match depends on the mathematical term that teachers assign for this task.)

PROVIDE STUDENTS WITH DIRECTIONS AND INSTRUCT THEM TO FOLLOW ALONG AS YOU READ ALOUD.

Instead of illustrating letters of the alphabet, for this project you will be illustrating some key geometry concepts. In the space provided, explain each of the geometry terms or concepts listed. You may do so either by:

- Writing a definition, or
- Using pictorial images with descriptive labels to illustrate the term or concept.

TO ACCOMMODATE STUDENTS OF VARYING MATHEMATICAL SKILLS, TASK ADMINISTRATORS MAY “JIG-SAW” THE FOLLOWING LIST SO THAT STUDENTS ARE ASSIGNED TERMS SUITABLE FOR THEIR COURSE OF STUDY IN MATHEMATICS.

- A. point
- B. line
- C. vertices
- D. ray
- E. plane
- F. angle
- G. right angle
- H. obtuse angle
- I. acute angle
- J. adjacent angles
- K. complementary angles
- L. supplementary angles
- M. diameter
- N. radius
- O. circumference

Activity 2

Activity 2 addresses the following grade 8 dance objectives:

Objective 1.1.b: Incorporate the elements of dance to develop dances that interpret a variety of stimuli

Objective 2.3.b: Analyze the ways in which the knowledge, skills, and processes of other disciplines are related to those of dance

TASK ADMINISTRATORS MAY WISH TO ENHANCE ACTIVITY 2 BY HAVING STUDENTS WORK ALONE OR IN SMALL GROUPS TO TRY OUT THE MOVEMENTS THAT THEY WILL REPRESENT, THROUGH WORDS AND/OR SIMPLE DRAWINGS. HOWEVER, THESE PERFORMANCES, WHICH ARE PREPARATORY IN NATURE, SHOULD NOT BE SCORED.

Now think about how you might go about using the human form to visually represent the math terms or concepts you have defined or illustrated. For each of the following steps, you may wish to actually try out one or more movements before recording your responses.

Step A

Identify one term or concept that could easily be represented through a sustained movement by one person without the use of props. Then, use words and/or a simple drawing to show how that concept could be represented in dance.

_____ could be represented as follows:

Step B

Identify one term or concept that could easily be represented through a sustained movement by one person using one or more props. Then, use words and/or a simple drawing to show how that concept could be represented in dance.

_____ could be represented as follows:

Step C

Identify one term or concept that could be represented through a sustained movement by one person only with the addition of words (e.g., a “voiceover”) or graphics to convey the idea. Then, use words and/or a simple drawing to show how that concept could be represented in dance.

_____ could be represented as follows:

Activity 3

Activity 3 addresses the following grade 8 dance objectives:

Objective 1.1.b: Incorporate the elements of dance to develop dances that interpret a variety of stimuli

Objective 2.3.b: Analyze the ways in which the knowledge, skills, and processes of other disciplines are related to those of dance

(THIS ACTIVITY ALSO ADDRESSES VARIOUS GRADE 6-8 MATHEMATICS OBJECTIVES UNDER STANDARD 2, INDICATOR A. IT SHOULD NOT BE SCORED FOR MATHEMATICS, HOWEVER, BECAUSE THAT WOULD CREATE A “DOUBLE JEOPARDY” SITUATION IN WHICH STUDENTS MIGHT BE PENALIZED TWICE FOR THE SAME ERRORS IN UNDERSTANDING DEMONSTRATED IN ACTIVITY 1.)

Do you think that any of the mathematical terms or concepts you have been given to represent would require two or more persons to illustrate? Explain your answer on the lines below, using what you know about dance movement and the various mathematics terms and concepts.

Activity 4

Activity 4 addresses the following grade 8 dance objectives:

Objective 2.3.b: Analyze the ways in which the knowledge, skills, and processes of other disciplines are related to those of dance

Objective 2.3.c: Create and *analyze movement sequences that demonstrate relationships between dance and other disciplines**

*Partial alignment with italicized words or phrases.

(ACTIVITY 4 ALSO ADDRESSES VARIOUS GRADE 6-8 MATHEMATICS OBJECTIVES UNDER STANDARD 2, INDICATOR A. IT SHOULD NOT BE SCORED FOR MATH BECAUSE THAT WOULD CREATE A “DOUBLE JEOPARDY” SITUATION IN WHICH STUDENTS MIGHT BE PENALIZED TWICE FOR SAME ERRORS IN UNDERSTANDING DEMONSTRATED IN ACTIVITY 1.)

Do you think that any of the math terms or concepts you have represented could only be shown through continuous movement, rather than sustained movement? Explain your answer on the lines below. Support your answer with examples based on what you know about dance and the various mathematics terms and concepts.

AFTER STUDENTS HAVE HAD A CHANCE TO RESPOND TO PLANNING AND PREPARATION ACTIVITIES 1-4, THEY SHOULD BE GIVEN THE OPPORTUNITY TO PREPARE FOR A RECORDED DEMONSTRATION OF THE MATHEMATICS TERMS THROUGH MOVEMENT WITH ONE OR MORE CLASSMATES, IF NECESSARY.

STUDENTS SHOULD CONSIDER HOW EACH OF THEIR “ILLUSTRATIONS” MIGHT BE BEST REPRESENTED: THROUGH USE OF A CONVENTIONAL OR DIGITAL CAMERA, A VIDEO CAMERA, OR BOTH. WHILE ALL STUDENTS WILL PREPARE AND PRESENT A MOVEMENT SEQUENCE (WHICH WILL BE VIDEOTAPED), THEY MAY NEED TO SUPPLEMENT THIS MOVEMENT SEQUENCE WITH ONE OR MORE STILL IMAGES (PHOTOGRAPHS) AND/OR NOTES ON POINTS IN THE SEQUENCE WHERE PARTICULAR MATHEMATICS TERMS OR CONCEPTS REQUIRE THAT MOVEMENTS BE HELD TO ADEQUATELY CONVEY THOSE IDEAS (E.G., WHERE VIDEOTAPE MIGHT BE PAUSED).

Activity 5

Activity 5 addresses the following grade 8 dance objectives:

- Objective 3.1.b: Structured rhythmic movement in space and time resulting in communication of an idea, mood, feeling, or situation
- Objective 1.3.c: Create and analyze movement sequences that demonstrate relationships between dance and other disciplines
- Objective 3.2.b: Create dances by selecting and applying choreographic forms to communicate meaning
- Objective 3.2.d: Organize dances by combining elements, aesthetic principles, and choreographic forms
- Objective 3.3.a: Demonstrate consistent application of awareness of space, concentration, physical discipline, projection, and clarity in rehearsals and dance performances

STUDENTS WILL DEVELOP A MOVEMENT SEQUENCE THAT INCORPORATES THEIR MOVEMENTS FROM PREVIOUS ACTIVITIES, THE ELEMENTS OF DANCE, CHOREOGRAPHIC FORM(S), AESTHETIC PRINCIPLES, AND PERFORMANCE COMPETENCIES.

AFTER STUDENTS CREATE AND REHEARSE THEIR SEQUENCES, THEY WILL PERFORM FOR THE CLASS. BASED ON THE MATHEMATICAL CONCEPTS THEY WISH TO REPRESENT, STUDENTS MAY PERFORM ENTIRELY SOLO OR MAY CALL UPON ONE OR MORE CLASSMATES AS COLLABORATORS.

RECORD STUDENTS' FINAL PERFORMANCES ON VIDEOTAPE AND THROUGH PHOTOGRAPHIC IMAGES, AS STUDENTS INDICATE.

IN ADDITION, PHOTOGRAPHIC IMAGES MAY BE COLLECTED AND PRESENTED IN BOOK FORM AS ONE COMPONENT OF THE FINAL PRODUCT THAT MAY BE SHARED WITH OTHER STUDENTS. ALTERNATIVELY, STILL IMAGES MAY BE TRANSPOSED INTO VIDEO WITH VOICE-OVER TO PROVIDE BACKGROUND, EXPLANATION, OR COMMENTARY.

Activity 6

Activity 6 addresses the following grade 8 dance objectives:

- Objective 1.1.a: Analyze various dances to determine how the elements of dance are used to communicate meaning
- Objective 4.1.a: Critique dance performances using the elements of dance, aesthetic principles, choreographic forms, and performance competencies as criteria to determine aesthetic value

THE FOLLOWING ACTIVITY IS A SELF- AND PEER ASSESSMENT ACTIVITY. TASK ADMINISTRATORS MAY EITHER ASSIGN A PEER TO EACH STUDENT OR PERMIT STUDENTS TO SELECT THE CLASSMATE WHOSE WORK THEY WISH TO REVIEW.

Suppose that you and your classmates will be sharing one or more of the videotapes and/or sets of photographic images with students who must learn these key mathematics terms and concepts. In preparation, you will determine the success with which this project has been completed by conducting a self-assessment of your own contribution as well as a peer assessment of another classmate's project/performance.

- a. First, review the movement sequence that you have created. Then, use the evaluation form that follows to make aesthetic judgments about your personal work based on your reflections and on viewing those images.
- b. Then, review the movement sequence created by a classmate. [AS PER TASK ADMINISTRATOR INSTRUCTIONS]

THIS MAY BE DONE INDEPENDENTLY OR IN THE PRESENCE OF THE CLASSMATE, WHO MAY CONTRIBUTE COMMENTARY DURING THE VIEWING. IF THE WORK IS VIEWED INDEPENDENTLY, PRIOR TO COMPLETING THE FORM, STUDENTS SHOULD CONDUCT A BRIEF 5-10 MINUTE INTERVIEW WITH THAT CLASSMATE TO FIND OUT MORE ABOUT THE WORK THAT WILL BE REVIEWED.

Evaluation of Dance Project/Performance

The Geometry of Graceful Movement

Name: _____

Classmate's Name: _____

Directions: After you have reflected upon and discussed your own work and that of another classmate, use the following scale to rate your own and your classmate's project/performance. Then, justify the ratings you gave under each criterion by describing how the project/performance met that criterion.

- 4 **Expert (exceeds standard for proficiency):** Considerable evidence of skill/understanding; clearly illustrates geometric concepts while consistently demonstrating performance competencies and technical proficiency
- 3 **Proficient (demonstrates standard for proficiency):** Adequate evidence of skill/understanding; clearly illustrates geometric concepts while generally demonstrating performance competencies and technical proficiency
- 2 **Apprentice (approaching standard for proficiency):** Some evidence of skill/understanding; generally illustrates geometric concepts, although only sometimes demonstrating performance competencies and technical proficiency
- 1 **Novice (attempts standard for proficiency):** Limited evidence of skill/understanding; minimally illustrates geometric concepts and only minimally demonstrating performance competencies and technical proficiency
- 0 **Nonparticipant (no evidence of attempt at standard for proficiency):** No evidence of skill/understanding

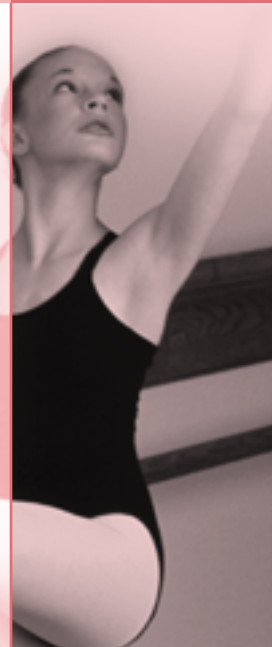
Project/Performance

1. Elements of dance

Justification for rating:

Mine: _____

My Classmate's: _____



2. Aesthetic principles

Justification for rating:

Mine: _____

My Classmate's: _____

3. Choreographic forms

Justification for rating:

Mine: _____

My Classmate's: _____

4. Performance competencies

Justification for rating:

Mine: _____

My Classmate's: _____

Activity 7

Activity 7 addresses the following grade 8 dance objective:

Objective 4.1.e: Articulate rationales to explain conceptualizations, aesthetic decisions, and effectiveness of personal performances, improvisations, and choreography

(This activity may also provide a measure of Writing to Inform. See Scoring Information.)

Other teachers have learned of your work on this project and are curious about how it may be useful to other students learning mathematics at your school. Use what you know and have learned in this project, as both a dancer and a mathematician, and explain how images of your dance movements could help other students understand the mathematics terms and concepts that you were trying to convey.

Thematically Linked Integrated Item Set

Dance

Student Instructions

Pre-Assessment Activity

Dance is widely accepted as a form of communication, similar to a language. Like all languages, that of dance may be considered to have an “alphabet” of component parts that can be put together in different ways for different expressive purposes. Over the next few _____ (CLASS PERIODS/DAYS) you will be using the language of dance to create another type of “alphabet,” one that helps others to understand the area of mathematics called geometry.

The expressive nature of dance was captured as a photo essay in a book on dance aptly titled *Dance*, which was written by Bill T. Jones. As a modern dance choreographer, the author uses dance movements to introduce young children to his ideas about the purposes and potential of dance. Take a look at how he uses his body to show the ideas relayed in the text.

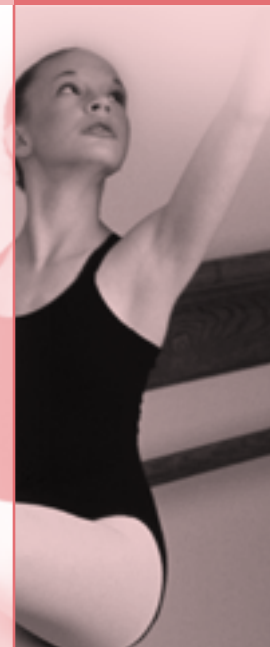
IF USING ONLY LOIS GREENFIELD BOOK or BOTH BOOKS: The expressive nature of dance was (also) captured in two books of photos by Lois Greenfield, titled *Breaking Bounds* and *Airborne*. The dancers are captured in action and often in the air. Their bodies show the relationship between geometry and dance. Take a look at the photos and see how many geometric concepts you can identify.

EXAMINE SAMPLE ILLUSTRATIONS FROM THE BOOK(S).

Just as these illustrations of a dancer help convey ideas about movement, the movements of the human form may also be used to convey other ideas and concepts. We can use the rich “vocabulary” of movement to convey mathematical concepts that are introduced to students through the study of geometry. A book that uses images of dancers in motion can help students learn, understand, and remember some key geometry concepts.

Using the human form to define or communicate images of an idea is not new. An example of this concept is seen in a traditional book art form, the decorative alphabet book. In such books, the letters of the alphabet are formed from other shapes such as flowers, machines, animals, and the human body in various positions.

Look at one or more decorative alphabets to see how letters are created out of unusual and imaginative forms. Then, with a partner, take turns, individually and together, making a few letters of the alphabet by moving your own bodies.



Activity 1

Instead of illustrating letters of the alphabet, for this project you will be illustrating some key geometry concepts. In the space provided, explain each of the geometry terms or concepts listed. You may do so either by:

- Writing a definition, or
 - Using pictorial images with descriptive labels to illustrate the term or concept.
- A. point
 - B. line
 - C. vertices
 - D. ray
 - E. plane
 - F. angle
 - G. right angle
 - H. obtuse angle
 - I. acute angle
 - J. adjacent angles
 - K. complementary angles
 - L. supplementary angles
 - M. diameter
 - N. radius
 - O. circumference

Activity 2

Now think about how you might go about using the human form to visually represent the math terms or concepts you have defined or illustrated. For each of the following steps, you may wish to actually try out one or more movements before recording your responses.

Step A

Identify one term or concept that could easily be represented through a sustained movement by one person without the use of props. Then, use words and/or a simple drawing to show how that concept could be represented in dance.

_____ could be represented as follows:

Step B

Identify one term or concept that could easily be represented through a sustained movement by one person using one or more props. Then, use words and/or a simple drawing to show how that concept could be represented in dance.

_____ could be represented as follows:

Step C

Identify one term or concept that could be represented through a sustained movement by one person only with the addition of words (e.g., a “voiceover”) or graphics to convey the idea. Then, use words and/or a simple drawing to show how that concept could be represented in dance.

_____ could be represented as follows:

Activity 3

Do you think that any of the mathematical terms or concepts you have been given to represent would require two or more persons to illustrate? Explain your answer on the lines below, using what you know about dance movement and the various mathematics terms and concepts.

Activity 4

Do you think that any of the math terms or concepts you have represented could only be shown through continuous movement, rather than sustained movement? Explain your answer on the lines below. Support your answer with examples based on what you know about dance and the various mathematics terms and concepts.

Activity 5

You will have an opportunity to prepare for a recorded demonstration of the mathematics terms through movement.

Consider how each “illustration” might be best represented: through use of a conventional or digital camera, a video camera, or both.

Also, consider that you may need to supplement movement sequences with still images (photographs) and/or notes about points in the sequence where particular mathematics terms or concepts require movements to be held to adequately convey the idea (e.g., where videotape might be paused).

Now you will develop a movement sequence that incorporates your movements from previous activities, the elements of dance, choreographic form(s), aesthetic principles, and performance competencies.

After you have created and rehearsed your sequence, you will perform it for the class. Based on the mathematical concepts you wish to represent, you may perform entirely solo or may call upon one or more classmates as collaborators.

Your performance will be recorded either on videotape or through photography, as you indicate.

Activity 6

Suppose that you and your classmates will be sharing one or more of the videotapes and/or sets of photographic images with students who must learn these key mathematics terms and concepts. In preparation, you will determine the success with which this project has been completed by conducting a self-assessment of your own contribution as well as a peer assessment of another classmate's project/performance.

- a. First, review the movement sequence that you have created. Then, use the evaluation form that follows to make aesthetic judgments about your personal work based on your reflections and on viewing those images.
- b. Then, review the movement sequence created by a classmate. [**AS PER TASK ADMINISTRATOR INSTRUCTIONS**]

Evaluation of Dance Project/Performance

The Geometry of Graceful Movement

Name: _____

Classmate's Name: _____

Directions: After you have reflected upon and discussed your own work and that of another classmate, use the following scale to rate your own and your classmate's project/performance. Then, justify the ratings you gave under each criterion by describing how the project/performance met that criterion.

- 4 **Expert (exceeds standard for proficiency):** Considerable evidence of skill/ understanding; clearly illustrates geometric concepts while consistently demonstrating performance competencies and technical proficiency
- 3 **Proficient (demonstrates standard for proficiency):** Adequate evidence of skill/understanding; clearly illustrates geometric concepts while generally demonstrating performance competencies and technical proficiency
- 2 **Apprentice (approaching standard for proficiency):** Some evidence of skill/understanding; generally illustrates geometric concepts, although only sometimes demonstrating performance competencies and technical proficiency
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- 0 **Nonparticipant (no evidence of attempt at standard for proficiency):** No evidence of skill/understanding

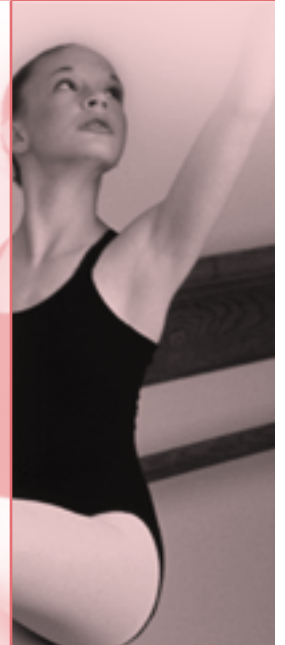
Project/Performance

1. Elements of dance

Justification for rating:

Mine: _____

My Classmate's: _____



2. Aesthetic principles

Justification for rating:

Mine: _____

My Classmate's: _____

3. Choreographic forms

Justification for rating:

Mine: _____

My Classmate's: _____

4. Performance competencies

Justification for rating:

Mine: _____

My Classmate's: _____

Activity 7

Other teachers have learned of your work on this project and are curious about how it may be useful to other students learning mathematics at your school. Use what you know and have learned in this project, as both a dancer and a mathematician, and explain how images of your dance movements could help other students understand the mathematics terms and concepts that you were trying to convey.

Thematically Linked Integrated Item Set Scoring Information

Activity 1 (Mathematics)

The number of definitions assigned will vary from class to class. Score each term or concept that students define and/or illustrate with labels.

This activity is scored using the following rubric.

The response to this activity provides evidence of the student's ability to identify and/or describe ____ [ADD PARTICULAR MATHEMATICS TERM OR CONCEPT HERE].

- 2 Mathematics term or concept is fully clarified through definition and/or labeled diagram or drawing; response is complete and fully correct
- 1 Mathematics term or concept is partially clarified through definition and/or labeled diagram or drawing; response may be partly complete/partly correct or may be overly general
- 0 Other

Answer Key

- A. Point: something having position but not spatial extent, magnitude, dimension, or direction
- B. Line: a straight or curved continuous extend of length without breadth
- C. Vertices: the points of intersection of two rays that form an angle, two sides of a polygon, or two edges of a solid
- D. Ray: a straight path that extends infinitely from a point, called its endpoint
- E. Plane: a flat surface that extends forever
- F. Angle: two rays with a common endpoint
- G. Right angle: an angle with a measure of 90°
- H. Obtuse angle: an angle with a measure greater than 90° and less than 180°
- I. Acute angle: an angle whose measure is between 0° and 90°
- J. Adjacent angles: two angles that share a vertex and a common side between them but have no interior points in common
- K. Complementary angles: two angles whose measures total 90°
- L. Supplementary angles: either of two angles whose sum is 180°
- M. Diameter: a chord that passes through the center of a circle
- N. Radius: the distance from the center of a circle to any point on the circle
- O. Circumference: the distance around (perimeter of) a circle

Activity 2abc (Dance)

This activity is scored using the following rubric.

The response to this activity provides evidence of the student's ability to incorporate the elements of dance to develop dances that interpret a variety of stimuli and to analyze the ways in which the knowledge, skills, and processes of other disciplines are related to those of dance.

- 3 Plausible and well-developed explanations for each example of a mathematics term or concept that could be represented by the following:
 - One dancer through sustained movement unsupported with props and/or graphics
 - One dancer through a sustained movement supported with one or more props
 - One dancer through a sustained movement to which words or graphics would need to be added
- 2 Generally plausible and adequately developed explanations of a mathematics term or concept that could be represented each of the three different ways OR a plausible and well-developed explanation for TWO
- 1 Only somewhat plausible and partly developed explanations of a mathematics term or concept that could be represented each of the three different ways OR a plausible and well-developed explanation for only ONE; the responses may contain some vague, redundant, or indefensible information
- 0 Other

NOTE: Teachers may elect to have students actually experiment with various movements in response to Activity 2, but performances are preparatory so they are not scored.

Activity 3 (Dance)

This activity is scored using the following rubric.

The response to this activity provides evidence of the student's ability to incorporate the elements of dance to develop dances that interpret a variety of stimuli and to analyze the ways in which the knowledge, skills, and processes of other disciplines are related to those of dance.

- 2 A plausible and well-developed explanation of whether or not any of the mathematics terms/concepts would require two or more dancers, based on knowledge of dance movement and choreographic forms
- 1 A partial (partly plausible/partly complete) or overly general explanation of whether or not any of the mathematics terms/concepts would require two or more dancers, based on knowledge of dance movement and choreographic forms
- 0 Other

NOTE: While mathematics provides the stimulus for the dance movements envisioned in Activity 3, this activity is not scored for mathematics in order to prevent "double jeopardy." Evidence of understanding of the mathematics terms assigned is demonstrated in Activity 1.

Activity 4 (Dance)

This activity is scored using the following rubric.

The response to this activity provides evidence of the student's ability to analyze the ways in which the knowledge, skills, and processes of other disciplines are related to those of dance and to analyze movement sequences that demonstrate relationships between dance and other disciplines.

- 2 A plausible and well-developed explanation of whether or not any of the mathematics terms/concepts would require continuous rather than sustained movement, based on knowledge of dance movement and choreographic forms
- 1 A partial (partly plausible/partly complete) or overly general explanation of whether or not any of the mathematics terms/concepts would require continuous rather than sustained movement, based on knowledge of dance movement and choreographic forms
- 0 Other

NOTE: While mathematics provides the stimulus for the dance movements envisioned in Activity 4, this activity is not scored for mathematics, in order to prevent "double jeopardy." Evidence of understanding of the mathematics terms assigned is demonstrated in Activity 1.

Activity 5 (Dance)

This activity is scored using the following rubric.

The response to this activity provides evidence of the student's ability to create dances by selecting and applying choreographic forms that demonstrate relationships between dance and other disciplines; to communicate meaning, while combining elements, aesthetic principles, and choreographic forms; and to demonstrate consistent application of awareness of space, concentration, physical discipline, projection, and clarity.

- 4 Performance is highly skilled and exceeds the standard for proficiency. Clearly shown geometric concept(s), identifiable choreographic form and aesthetic principle, performance competencies, and technical proficiency at a high level
- 3 Performance is adequately skilled and meets the standard for proficiency. Clearly shown geometric concept(s), identifiable choreographic form and aesthetic principle, performance competencies and technical proficiency generally shown
- 2 Performance is only somewhat skilled and only approaches the standard for proficiency. Generally shown geometric concept(s), identifiable choreographic form and/or aesthetic principle, performance competencies, and technical proficiency generally shown
- 1 Performance is minimally skilled and only demonstrates an attempt to show a geometry concept, choreographic form, and aesthetic principle. Performance competency and technical proficiency are weak
- 0 Other

Activity 6 (Dance)

This activity is scored using the following rubric.

The response to this activity provides evidence of the student's ability to analyze various dances to determine how the elements of dance are used to communicate meaning and to critique dance performances using the elements of dance, aesthetic principles, choreographic forms, and performance competencies as criteria to determine aesthetic value.

- 3 For each criterion, student assigns a numerical rating and describes characteristics of the project/performance that clearly and accurately support that choice
- 2 For each criterion, student assigns a numerical rating and describes characteristics of the project/performance that generally support that choice OR the student describes characteristics of the project/performance that clearly and accurately support two or three of the criteria
- 1 For each criterion, student assigns a numerical rating and describes characteristic(s) of the project/performance that partially support that rating; description of characteristics is partially correct, incomplete, or overly general
- 0 Other

NOTE: This activity may also be used for formative assessment or diagnostic purposes. Teachers may wish to review all evaluation forms as a resource in preparation for student-teacher conferences or simply to obtain information to guide instructional decision making. Teachers may also wish to modify Activity 6 to focus solely on self-evaluation OR solely on peer evaluation. The scoring tool above has been designed so that it can be used to evaluate either or both.

Activity 7 (Dance)

This activity is scored using the following rubric.

The response to this activity provides evidence of the student's ability to articulate rationales to explain conceptualizations, aesthetic decisions, and effectiveness of personal performances, improvisations, and choreography.

- 2 A plausible and well-developed explanation of the impact/effectiveness of using dance as a vehicle for illustrating/making clear to middle school students various key mathematics terms and/or concepts
- 1 A partial (only somewhat plausible/incomplete) or overly general explanation of the impact/effectiveness of using dance as a vehicle for illustrating/making clear to middle school students various key mathematics terms and/or concepts
- 0 Other

Activity 7 (Reading/ELA) (Optional)

Teachers may wish to use either the “Writing to Inform” scoring rubric below or any other 0-2 or 0-3 scoring tool designed to evaluate brief informative texts scored for informative writing.

- 2 Consistently addresses audience’s needs by using purposeful and specific information to fully explain the topic. Text is uniformly organized, and language choices often enhance the text
- 1 Sometimes addresses audience needs by using purposeful and mostly specific information to adequately explain the topic. Text is generally organized, and language choices sometimes enhance the text
- 0 Rarely or never addresses audience’s needs by using purposeful or specific information to explain the topic. Text lacks organization, and language choices seldom, if ever, enhance the text