



Moving Through Math

A workshop or residency with aTrek Dance Collective

Moving Through Math will show you how dancers use math everyday. The dancers will show you how they practice inventing new shapes with their bodies by using straight and curved lines. They will show you how they create circles, squares or other shapes. The dancers will also show you how they can make parallel lines and angles with their bodies and how they can use these and other mathematical concepts to help them

create dances. Also, the dancers will show you how they use counting, adding and subtracting in dance.



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Artist Bio: aTrek Dance Collective

The aTrek Dance Collective is a not for profit organization of St. Louis based dance artists dedicated to the development of local contemporary modern dance programs. Their primary activities include creating opportunities for advanced training and development of dance

artists and the presentation of their work. aTrek offers community based activities including master classes, workshops, school residencies, and performances. They promote the values of artistic expression, physical awareness, and cultural diversity through

dance. aTrek provides outreach and educational programming to bring the art form of modern dance alive for people of all ages. This part of our mission continues to play a major role in our programming. aTrek performs high quality modern dance concerts and educational

programs. We seek to help audiences more deeply appreciate and benefit from the experiences in movement and dance.

Learning objectives

Grade Level:

K-4

Curriculum Connections

-Communication arts
-Critical Thinking/Problem Solving
-Physical Education
-Mathematics

Students will:

- increase their understanding of basic concepts in the elementary math curriculum through creative and non-linear

learning processes including movement and kinesthetic awareness

- reinforce students understanding of geometric and organic shapes and lines

- gain awareness about dance and the process of choreography (creating dances)
- appreciate dance as an art form

Preparing for the Program

Please review appropriate audience behavior with students. Please advise them that they may be asked to participate/dance during the presentation. They should wear appropriate clothing and shoes if they are interested in this

option. Please review the consequences of inappropriate assembly behavior.

- **Generate a discussion with students about their relationship to dance: What is Dance? Do you dance? When/where do you**

dance?
What are some different dance styles?
What does the word choreography mean?
What are some different dance styles?
What does the word choreography mean?



Vocabulary

- **Choreograph:** to set a series of movements to counts to create a dance
- **Choreographer:** the person who invents the movements and puts it together to make a dance
- **Choreography:** the precise patterns, timing and shapes of movement the dancers learn to make a dance
- **Counts:** the timing of a movement and when it's performed in a movement phrase
- **Phrase:** a combination of movements which are memorized by the dancers. Many phrases together create choreography, just as phrases of words are put together to create sentences or paragraphs.
- **Rehearsal:** the practice in

preparation for a public performance.

- **Shapes:** a design a dancer makes with their body (curving, straight, angular, twisted)
- Math Vocabulary:**
- **Angle:** two lines that come together at a point
 - **Circle:** a shape that is made by one arcing line that begins and ends at the same point in space
 - **Line:** a mark through space that may be straight, arcing, circular or angular
 - **Parallel Lines:** two lines that never touch
 - **Rectangle:** a shape/polygon that has 4 points, 2 equal sides and opposite sides are parallel
 - **Square:** a shape/polygon that has 4 points, 4 equal sides and 4 right/perpendicular angles

- **Triangle:** a shape/polygon that has 3 points and 3 sides
- **Perpendicular:** Two lines that intersect at 90-degree angles.
- Intersecting Lines:** Two lines that come together at a point.
- Slide:** Motion in one direction that does not leave the ground.
- Turn:** A change in the direction of movement or orientation of object in relation to the space.
- Flip:** To turn half way around (180-degrees turn)
- Acute Angle:** An angle that is less than or smaller than 90-degrees.
- Obtuse Angle:** An angle that is greater or larger than 90-degrees and less than 180-degrees

After the program...

Have students WRITE A NEWSPAPER REVIEW

of Moving Through Math. Ask students to:

1. Describe the performance. Tell what happened.
2. Critique the performance. Tell what they liked and why. Tell what they didn't like and why.
3. Do they recommend that others attend this? Why or why not?

The Shape Dance

Explore **shapes** with your body for Grades K-3

1. Make a tall, straight shape. Make a curving shape. Make a shape with an angle. With two angles. With many angles. Make a shape that's symmetrical. Make a shape that's asymmetrical. Make the shape of a circle. A square. A triangle. A rectangle. A spiral. Make

one of these shapes upside down! Balanced on one foot!

Grades 4, 5, 6

1. In groups of four. Each person creates a shape and teaches it to the others in the group. Put the four shapes together into a movement phrase.
2. Memorize and rehearse it so the transitions are smooth.
3. Perform your movement phrase for others.



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Springboard provides programs in the arts, cultures, humanities, and sciences to schools and community organizations. These programs inspire their audiences to embrace knowledge and new experiences that broaden their horizons.

Resources

- Anno, Mitsumasa. Anno's Counting Book. New York: Thomas Y. Crowell, 1975.
- Braddon, Katheryn with Nancy J. Hall and Dale Taylor. Math through Children's Literature. Englewood, CO: Teacher Ideas Press. 1993.
- Burns, Marilyn. The I Hate Mathematics! Book. Boston: Little, Brown. 1975.
- Charosh, Mannis. Straight Lines, Parallel Lines, Perpendicular. New York: T. Y. Crowell, 1970
- Dancing. PBS, series of

eight videocassettes; 60 minutes each. Program 1: The Power of Dance; Program 2: Lord of the Dance; Program 3: Sex and Social Dance; Program 4: Dance at Court; Program 5: New Worlds, New Forms; Program 6: Dance Centerstage; Program 7: The Individual and Tradition, Program 8: Dancing in One World.

- Gilbert, Ann Green. Creative Dance for All Ages. Minnesota: Burgess Publishing. 1977.
- Kaufmann, Karen A. A Collection of Creative Movement Lesson Plans,

Written by Montana Teachers. Dept. of Drama/Dance; University of Montana, Missoula, MT 59812.

- Kaufmann, Karen A. The Language of Movement, An Idea Book for Teachers. Dept. of Drama/Dance; University of Montana, Missoula, MT 59812.
- Fisher, Leonard Everett. Symbol Art. New York: Four Winds Press. 1985.
- Russell, Solveig Paulson. Lines and Shapes. New York: Henry Z. Walck, 1965.

Teachers must remain in the classroom with students at all times. Thank you.

Day by Day Schedule (for Residences)

This is a sample syllabus which was custom designed to fit within an actual classes' progress through their math curriculum for the year. Each residency is slightly different based on the grade of the students, the time of year the residency is completed, and the classroom teacher's assessment of students for curriculum support.

Day 1

Background Information:

Review basic shapes (circles, squares, triangles, rectangles, etc.)

Objectives:

At the conclusion of this lesson students will be able to:

1. Define dance as movement in space/time.
2. Define parallel, perpendicular, angle, and intersecting lines.
3. Begin to develop movement phrases by using these definitions. (32 counts)

Input Activities

Instructor will:

1. Provide warm-up.
2. Provide discussion of what the students saw in "Math Movement" choreography.
3. Involve the students in exercises that will allow them to explore creating movement.
4. Begin to assign specific movement/counts to their dance. (Math Movement "choreography" 32 cts).

Day 2

Background Information:

Review previous lesson/choreography

Objectives:

At the conclusion of this lesson students will be able to:

1. Define dance space, slide, flip, and turn.

Input Activities:

Instructor will:

1. Provide warm-up.
2. Add on 16 cts. of choreography, teachers choice (wacky 8, curves, etc., incorporate slide, turn, flip)
3. Group students together to make a "dance map." (PLEASE NOTE THAT THEIR DANCE MAP COMES FROM THE 16 CTS. THAT THEY JUST DEVELOPED)

Day 3

Objectives

At the conclusion of this lesson students will be able to:

1. Explore time with the already created movement. (changing tempo)
(The teacher can use various hand clapping rhythms for change of tempo)

Anticipatory Set

Instructor will introduce various hand clapping rhythms to begin discussion of timing.

Input Activities

Instructor will:

1. Divide students and allow them to create a space formation of their choice. (the groups might be mixed based on dance map activity)

Day 4

Objectives

At the conclusion of this lesson students will be able to:

1. Define acute/obtuse angles.

Anticipatory Set

Instructor will ask students to define acute/obtuse. Once this is complete students will get into groups and see how many angles they can identify in the shapes made by their partner with his/her body.

Input Activities

Instructor will:

1. Provide warm-up
2. Allow students to create a shape picture with their dance group using lines and angles that intersect. (16 ct. dance ending)

Day 5

Objectives

At the conclusion of this lesson students will be able to:

1. Summarize what they learned over the week.

Input Activities:

Instructor will:

1. Allow students to give in class performance.

GLE's (Grade Level Expectations)

Communication Arts

Listening

- 1 A Grades K-5
- 1 B K-5
- 2 A K-5

Math

Geometric and Spatial Relationships

- 1 A K-5
- 1 C 1,3,4,5
- 2 A K-5

Physical Education

Physical Activity and Lifetime Wellness

- 1 A K-5
- 1 C 2-5
- 2 A K, 2, 3, 4, 5
- 3 A K-5

Efficiency of Human Movement and Performance

- 1 A K-2
- 1 B K-2
- 3 A K-3
- 3 B K-3, 5