Dancing Geometry

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Grade 2

Subject Math

Topic Symmetry and Asymmetry

Descriptive Sentence
Help your students understand geometry and spatial sense from a new perspective – put it into their bodies! This unit will explore the concepts of symmetry and asymmetry (among others) as they create and share their own dances.

Curricular Outcome or Expectation
Please see the lesson plan preview for the expectations/outcomes for your province.

Materials
1. CD Playback System  
2. Large cards with vocabulary words (over, under, outside, inside, behind, beside, in front of, above, below, symmetrical, asymmetrical, high, medium, low, forward, backward, sideways)  
3. Sticky tack to attach cards to the wall, or a "holder" of some sort  
4. Video camera and/or still camera (digital or otherwise) to record images during final session

Space Requirements
Gym or mini-gym with a CLEAN floor!

Complete Description of Unit Activities

Lesson 1

Getting Ready

• Sit in a large circle and discuss: What is a warm up? Who does warm ups? Why? Explain that a warm up is a series of movements or exercises designed to prepare the body and mind for specific physical activities. People who are involved in dance, sports, recreational activities, need to warm up so that there is an increase of blood and oxygen flow to the muscles and to ensure that their mind is focused on the activities at hand so that injuries are less likely to occur.

Please take a moment to review the "Warm-Up" Video
• Warm up: Stand in a circle formation. Begin with the head. Turn to side, centre, other side, centre. Tip the head so the ear is toward the shoulder, upright, other ear to shoulder, upright. Bend neck to look toward the floor, centre, slightly upward, centre. Now complete full circle rotations in each direction.
• Raise shoulders then lower both together one at a time. Circle shoulders backwards and forwards, one at a time, then alternating.
• Flex and release wrists while raising arms over head. Create circles as you bring arms back down to your sides. Touch each finger individually to the thumb, spread fingers and then close them. Make fists, extend and open the hand fully.
• Bend knees keeping legs and feet close together. Repeat with feet shoulder width apart. Keep feet parallel and knees over toes. Raise weight onto balls of the feet, keeping legs stretched and feet together. Repeat with feet shoulder width apart.
• Raise and lower the heel of the foot only, keeping the ball and all toes firmly on the floor. Alternate the heel raises, begin a slow walk, increase the tempo and march with knees high. Run on the spot and increase the tempo.

**Note:** Each body part warm-up activity needs to be repeated several times. Total warm-up time should be approximately ten minutes.

**Develop**

Gather students together at one end of the room. Discuss different styles of dance. (Folk dance, square, tap, disco, ballroom, ballet, Chinese ribbon dancing, Pow Wow dancing, jive, line dancing). What are the similarities/differences?

Contemporary dancers (modern dance) usually begin the warm up in the centre of the floor and travel across the floor in lines.

• Ask five students to be leaders, and the rest of the class to line up behind, creating five equal lines. With music playing, ask the leaders of each line to walk across the floor, any way they choose, keeping the beat of the music. Encourage the students to explore unique ways of walking (crab walk sideways, backwards "funky" walking with head movements, walking with very large steps, baby steps, etc.)
• Repeat with second in line, third etc. until all have had a turn.

Please take a moment to review the “Transitions” Video

• Now begin again with the leaders of the 5 lines traveling across the room any way they wish, but specify the level. Next, give a specific direction they must travel in when crossing the floor: forwards, backwards or sideways. Again, students choose what kind of movements they will use.
Application

FREEZE DANCE

- Ask the students to spread out in the space so they are not touching anything except the floor. Explain that each time they hear the music they can move/dance any way they choose, and each time the music stops (use the pause button) they must FREEZE instantly. Every time the music stops instructions will be given so the students must listen carefully.
- Ask students to travel sideways/forward/backward) when they dance. Ask them to freeze at a low/medium/high level when the music stops.

CREATING A DANCE.

- Ask each student to find a partner and follow the instructions as they are given. Stand BESIDE your partner in an interesting shape (this is the starting position for the dance) Explore different ways of showing "IN FRONT OF". Explore different ways of showing "OVER". Explore different ways of showing "BEHIND". Explore different ways of showing "UNDER". Select specific shapes for each of the above four instructions (In front of, over, behind, under). Repeat the movements one immediately following the other (in eight counts each, then in four counts each).
- Divide the class in half and ask one half to share with the other. Discuss observations.

Closure

- Ask students to sit in a place where they can see the vocabulary cards. Initiate a discussion about the words that were introduced and throughout the following vocabulary discussion ask individual students to come up and select the appropriate cards as they are mentioned. Once a correct card has been selected ask another student to physically demonstrate an example.
- Review by asking the questions: What three levels did we use today? (Low, Medium, High) Who can show a low/high/medium level shape? Who can travel at a low/medium/high level? What three words describe the directions we traveled in today? (forward, backward, sideways) What words did we use in our dance? (Beside, In Front Of, Over, Behind, Under)

Extensions

1. Introduce two dimensional drawings/images that are symmetrical and asymmetrical
2. Review the dance phrase created as a class.
Lesson 2

Getting Ready

WARM-UP: Repeat the warm up as in lesson.

- Add new concepts of INSIDE and OUTSIDE by asking them to step inside the circle and then outside the circle with the rhythm of the music. Repeat with two-footed jumps, repeat with arm gestures of any kind and repeat with small kicks into the circle. What other ways can you move inside and outside the circle?

- Travel across the floor reviewing different ways of walking with specific levels (low/medium/high) and in specific direction (forward/backward/sideways)

FREEZE DANCE. Increase the difficulty by combining levels and directions (e.g. travel sideways at a low level, travel backward at a high level)

Develop

- Discuss the terms symmetrical and asymmetrical. To help students understand this concept, stand in a symmetrical shape and invite a volunteer to come and draw an imaginary line down the centre of your shape (line of symmetry).

- Change your shape, making some shapes symmetrical and some asymmetrical, while the students decide the answer.

- Now ask the students to stand in their own space and create their own symmetrical or asymmetrical shape.

- Return to the freeze game and add the new vocabulary words to your instructions: Freeze in a symmetrical/asymmetrical shape. When you freeze, demonstrate INSIDE / OUTSIDE / IN FRONT OF / OVER / UNDER / BEHIND / BESIDE

Application

- Review the dance created during Lesson 1. Add to the dance by asking each student to create a symmetrical shape. Choose two and have everyone copy these two shapes. Repeat with asymmetrical.

- The dance phrase now looks like this: BESIDE (opening position), IN FRONT OF, OVER, BEHIND, UNDER, SYMMETRICAL SHAPE # 1, SYMMETRICAL SHAPE # 2, ASYMMETRICAL SHAPE # 1, ASYMMETRICAL SHAPE # 2.

- Refine by making the dance "cleaner". Trying to develop smooth transitions (take out all extra movement) and work in silence. Communicate only with movement.

- Divide the class in half and share with each other. Take time to discuss observations.

Please take a moment to review the "Transitions" Video
Closure

• Return to a place where everyone can see the vocabulary words. Review and reinforce the new words: SYMMETRICAL, ASYMMETRICAL, INSIDE, OUTSIDE

Extensions

Review the extended dance.
Have the students create, creating a symmetrical/asymmetrical "image" by using several different three dimensional objects (so they get the idea of moving things around until the two sides of the image are the same/different)

Lesson 3

Getting Ready

WARM-UP: Repeat previous isolations in the warm up. (See Lesson 1).
• Travel across the floor combining levels and directions. Gallop across the floor BESIDE your partner, the same one that you have for the dance. Gallop across the floor in a half-moon pattern and pause when you meet with one person ABOVE and one person BELOW.
• Review the Freeze Dance using levels, directions, symmetry, asymmetry, beside, inside, outside, above, below.

Develop

• Ask a student from the class to create a shape. Create a shape with your body so that you and the student together form a symmetrical image. Ask the class to find the line of symmetry. Depending on the shapes chosen, there may be more than one line of symmetry.
• Ask the students to work with a new partner and find two symmetrical and two asymmetrical shapes. Divide the class into half and have them share with each other.

Application

Please take a moment to review the "Math Dance" Video

• Review the dance and add the new concept of symmetrical and asymmetrical. Working with their "dance" partner the students now need to create two symmetrical and two asymmetrical shapes to add to the dance (note that these will be different for each set of partners). Complete the dance by adding the half-moon gallop pattern and the ABOVE/BELOW shape. Remind the students to think about smooth transitions (moving directly from one shape to the next) and working quietly, communicating only with movements.
Closure

- Divide the class in half and share with each other. Discuss observations - What was interesting? Why? Were the transitions smooth? What vocabulary words were observed in the dance? Were the symmetrical shapes truly symmetrical?
- Review the new vocabulary words and discuss what has been experienced.

Resources

Music Resources
Geoff Bennett "Music for Bipedal Movement" (www.ttgmusic.com)

Assessment

Do the students understand the following concepts: symmetrical, asymmetrical, under, over, inside, outside, in front of, behind, beside, above, below?
Rating Scale (5=excellent and 1=needs improvement)
Willingness to take risks, try new things
Attentiveness to the directions
Willingness to apply self
Ability to work with others

Glossary

Vocabulary: symmetrical, asymmetrical, over, under, inside, outside, in front of, behind, beside, above, below
Dance terminology: Warm-Up: Preparing your body and mind for physical activity so that you do not get injured. Isolations: moving one body part at a time.