# Levels 7/8 Dance Activity

## Choreographic Exploration of Relationships and Form

### Introduction to Numeracy in Dance

Dance students undertake tasks to make and respond to choreography and performance. Students use their bodies in a variety of ways to understand and communicate an intention, and to understand how choreographers manipulate the elements of movement to express ideas. There are at least four aspects of mathematics that can be related to dance: spatial exploration, rhythm, structure, and symbolisation (Watson, 2005). People learn about shape by physically interacting with it. Kinaesthetic and musical sensitivities are joined together in the rhythms of dance. Abstract representations of structure, such as permutations, combinations, graph theory, and groupings, are manifested in many traditional dances. Dancers and choreographers seek notations to convey the complexities of dance, so that its communication and preservation do not depend on a continuous line of teachers.

Key elements of dance that may involve numeracy are:

* Space: three-dimensional shapes and pathways
* Time: duration, speed, and metre
* Dynamics: the range of force and flow in combination; height applied to execute a movement or sequence
* Relationships: spatial awareness and spatial organisation
* Form: the shape or structure of a dance according to a preconceived plan

The potential use of dance to motivate mathematical ideas lies in the relationship between movement, mind, and memory, and develops through experience and the senses. Dance students explore skills, concepts, and ideas kinaesthetically. That is, they use their bodies to explore their world and communicate ideas to others. Dance students develop skills that are “transferable across learning contexts and support development of literacy and numeracy capabilities” (Australian Curriculum, Assessment and Reporting Authority, n.d.). A range of ways that students can embody transferable numeracy concepts in Dance Levels 7 to 10 can include:

* Using spatial skills when planning and analysing relationships between body and space to communicate an intention
* Considering mathematical concepts alongside choreographic aspects, such as using explicit mathematical language to articulate the thinking that underpins bodily performance of time, space, dynamics, level, direction, dimension, shape, plane, angles, and pathways
* Extending and developing patterns through manipulation of groupings of symmetry and asymmetry
* Extending and developing patterns through manipulation of group structures in unison, contrast, and canon
* Using physical tools (i.e., the body) to experiment with tempo, momentum, duration, acceleration, and deceleration

Students acquire knowledge and skills in numeracy throughout their lifespan. In Levels 7 to 10 Dance, students continue to apply and develop their numeracy capabilities. For example, students use their knowledge of patterns and sequences to explore and develop dance forms such as binary (A, B), ternary (A, B, A), rondo (A, B, A, C, A), theme and variation (A, A1, A2, A3, etc.), and palindrome (A, B, C, B, A) to convey choreographic intentions. Students can use their understanding of geometric properties to determine the area of the performance space and to explore concepts such as positioning and locating when designing floor patterns and pathways. Students extend their knowledge of measuring time when choreographing to music. In doing so, they also employ algebraic thinking, such as recognising and analysing patterns in music (melodic, rhythmic, etc.) or analysing the rhythmic pattern of a piece of music and determining how to manipulate the dance element of time. Students also use timelines when studying changes in dance styles over time. By incorporating these mathematical concepts, students are able to make and respond to dance works.

### Developing Numeracy Understanding in Dance

Dance is deliberate, planned movement for aesthetic purpose and/or to express or convey meaning. Dance cannot be engaged with at any level without understanding the embedded mathematics in action (Beck & Sellars, 2018). While dancing, learners explore and understand numeracy concepts in an embodied manner; thus, dance is an embodied way of experiencing numeracy. Barbour (2011) acknowledges the body as “a place to store knowledge, a place to extract knowledge from, and a place to exhibit knowledge. And that exhibition is revealing the organized integrated mind/body/spirit” (p. 94). Numeracy concepts and vocabulary can be developed through dance by understanding and embodying the language of mathematics through body actions, such as quarter/half/whole turn, 90/180/360 degree turn, right angle pathway, left/right direction, large/small shapes, fast/slow use of time, or increasing/decreasing effort.

Systematic methods of dance notation have been developed and refined throughout history. The first device to be considered a true notation system was found in Cervera, Catalonia (now part of Spain): Manuscripts from the 15th century featured the first use of signs to represent and record popular dances (Hutchinson Guest, n.d.). Dance notation involves methods such as graphic symbols and figures, path mapping, numerical systems, and letter and word notations. In more contemporary methods, dancers are able to notate movement qualities in addition to the movements themselves. Laban’s (1956) systematic method of notation of expressive movement provides a structure for planning, teaching, and assessing dance/movement experiences (Davis, 1995). A quality of movement—for example, light or strong—can be used to describe the effort involved. The expressiveness of each Laban Effort Action indicates the extent of time, space, force, or flow used by the dancer in a movement or sequence (Davis, 1995).

Dancers use their bodies to expressively represent shapes and groupings. They also use shapes to notate body actions. Although dance curricula do not include overt references to positioning and locating, these skills are essential and implied in dance notation (e.g., when drawing a dance map to plan choreography in a space). Notating dance on paper or on devices helps learners to recognise and understand elements of dance when they see them. Dance instruction based on notation-use can assist in recognition abilities, integration of the recognition skills needed for development in dance, and early skills in performing movement (Warburton, 2000).

Dancers embody numeracy in a number of ways. They experience rhythmic patterns, which may be metered or free form. When using Western music to assist to convey and choreographic intention, dancers often experience repeating patterns (e.g., 2/4 or 3/4). However, concepts of time and metre are used very differently throughout the world. Dance can be discussed with reference to units of time such as seconds, minutes, and/or hours. For example, a certain section of a dance may be assigned a time (e.g., 30 seconds, 16 beats) into which the choreographed movements must fit. Dancers kinaesthetically monitor each other’s timing in group works, and can respond to each other in improvisation. For example, dancers gradually increase from a walking tempo to a running tempo by cueing off each other. Dancers and choreographers also manipulate time to assist in expressing their choreographic intention in group works. Combinations of the same/different movements at the same/different times result in choreographic devices such as canon (same movement one after the other), accumulation (1, 12, 123, 1234), unison (same movement or movements at the same time), and contrast (different movements at the same time).

## Lesson Plan: Lesson Plan: Choreographic Exploration of Relationships and Form

In this lesson, students will explore relationships (i.e., group structures) as one of the elements of dance, and form. The elements of dance—space, time, dynamics, and relationships—will be viewed, notated, and experienced in relation to creating and communicating ideas and intentions through dance. Form is the shape or structure of a dance, according to a preconceived plan.

Students will first explore choreographic decision-making about relationships, namely group structures. Group structures are spatial relationships created by manipulations of choreography within groups, such as:

* Canon: an action or phrase that is repeated exactly in turn by two or more dancers with a successive time delay
* Contrast: exists where there is a time, space, or energy difference in choreography between any single dancer in a group and any of the other dancers, and thus can be present in all group structures and formations apart from unison. There are many types of contrast such as action and reaction, and call and response.
* Unison: a time-based manipulation that is evident when all the dancers in a group perform exactly the same choreography at the same time.
* Asymmetrical: group formations that appear to be uneven when divided by a central line
* Symmetrical: group formations that appear to be even when divided by a central line

The performance space may also be used asymmetrically or symmetrically if one or more groups is/are placed unevenly or evenly within the space.

In this lesson, students will also explore choreographic decision-making about form: the shape or structure of a dance, according to a preconceived plan. For example, a binary form is an A section followed by a B section; ternary form is an A section, followed by a B section, followed by a repeat of the A section; rondo is an expansion of the ternary form into ABACADA; and narrative form is a dance in which a story is told. Contemporary choreographers may use these over-arching forms, but often devise a form that is specific to each work they create, known as free form. For the purpose of this lesson, the focus will be on students recognising and using over-arching forms of binary, ternary, and rondo.

### Prerequisite/Corequisite Knowledge: Dance

Students need to have and/or will develop the ability to:

* Understand how the elements of dance can be manipulated to express a choreographic intent
* Use safe dance practices
* Make literal movements into symbols and symbols into literal movements

### Background Mathematical Skills and Understandings

Teachers of Dance are not expected to teach the mathematical knowledge and skills that students will draw upon when engaging with this activity. The students will have learnt and should be adept with the required mathematical knowledge and skills to complete the activity. According to the Victorian Curriculum: Mathematics, the required mathematical knowledge and skills should have been developed in earlier years of schooling, that is, by the end of Level 6.

For this activity, the background mathematical skills and knowledge are:

* Knowledge of patterns and symmetry/asymmetry, and the ability to distinguish between symmetrical and asymmetrical patterns
* Ability to recognise and develop number patterns
* Knowledge of two-dimensional and three-dimensional shapes
* Knowledge of measurement of time
* Ability to create and interpret simple grid maps (floorplan) to show position and pathways, and to use simple scales and legends
* Experience in movement within spaces, and associated directional terminology

## Lesson Description

In this lesson, the teacher will facilitate an inquiry into group structures and form. The teacher can decide how long the inquiry might take, based on the students’ level of experience. There is a 30–45 minute Engage and Explore stage, in which the relationship element of dance is introduced; a 60–90 minute Explain and Elaborate stage, where students embody the theoretical understandings of relationships and form; and a 30–45 minute Student Evaluation stage.

### Stage 1: Engage and Explore

To introduce the dance relationship concept of canon, the teacher will set their expectations for learning and interacting through an introductory activity. First, students will revise their knowledge of ‘rounds’ by revisiting commonly-known Western songs such as:

* Row, Row, Row Your Boat: [https://www.youtube.com/watch?v=7otAJa3jui8&ab\_
channel=SuperSimpleSongs-KidsSongs](https://www.youtube.com/watch?v=7otAJa3jui8&ab_channel=SuperSimpleSongs-KidsSongs)
* Hey Ho Nobody Home: <https://www.youtube.com/watch?v=FvrPRU-EZOI>
* Let’s Sing All Together: <https://www.youtube.com/watch?v=at02L3sd3Xw>
* Three Blind Mice: <https://www.youtube.com/watch?v=5HCR_7ll5aM>
* Frère Jacques: <https://www.youtube.com/watch?v=kZPqYuKwiag>
* or others: <https://flypaper.soundfly.com/write/remember-the-rounds-we-sang-as-kids-theyre-actually-canons-and-canons-are-awesome/>

The teacher can also engage students in a discussion of, and search for, examples of rounds from varied cultures.

Next, in groups of three to five, students will create simple gestures for each of the phrases/lines/counts. They will then practise doing their movements in a canon, matching the lyrics, and informally present their movements to one another.

After the exploration of canon, the teacher will introduce and define the names of the other four relationships in dance: unison, contrast, symmetry, and asymmetry. The teacher will guide students to observe and record the five relationships in a group dance work. The teacher can select any group dance work for this task, or use ‘Cry Me A River’: <https://www.youtube.com/watch?v=-I-SE6Q9Le0&ab_channel=AndrewWinghart>. This work has been selected based on the examples of relationships within the work, the symbolic over-representation of women and girls in Western contemporary dance settings, the promotion of strong men and people of colour, and the use of popular music that would appeal to Year 7/8 students. Students will work individually to notate examples of relationships by noting the timecode and then devising a name for each instance, such as:

* Symmetry from 0:29 to 0:42, as dancers enter in two symmetrical circles
* Canon at 0:45, during the arm scoop phrase
* Asymmetry from 1:05 to 1:19, as there is an asymmetrical use of space in running, and an S shape used
* Unison from 1:25 to 1:30, during the jump, turn, roll phrase
* Contrast from 2:16 to end, as the soloist contrasts with the ensemble

The teacher will direct students to draw a scaled floorplan by hand, or on their device, of the performance space in the video. Students could construct a floorplan based on the following information (using a calculator for the calculations):

* The length of the upstage line of the triangle at 2:43 is 10 m, and the left and right sides are 8 m.
* The space on either side of the ensemble dancers at each vertex of the triangle at 2:43 is 5 m.
* The arm span of the soloist, dressed in black, is 1.8 m.
* There are 36 ensemble members, dressed in blue.

Students will notate four moments in the dance work: two examples of symmetry and two examples of asymmetry. Students will use symbols (such as x or o) to represent dancers in the space from an aerial perspective on their floorplan. The students’ four examples might be overlaid in different colours on a single floorplan, or each representation could be on a separate floorplan. To conclude this stage, the teacher will pair students and instruct them to share their floorplans with each other. The students will analyse and evaluate the calculations that they made to create their floorplans, and the accurate positioning of the symbols they used to represent dancers.

### Stage 2: Explain and Elaborate

The teacher can choreograph their own dance phrase/section for this stage, or the following examples could be taught.

* Stand Up: <https://www.youtube.com/watch?v=DxKfVyCGh24> from 0:56 (lyrics “I do what I can… for my people”) to 1:34 when the dancers collapse
* Move it Mob Style: <https://moveitmobstyle.com.au/videos/> There are multiple phrases on this site. Teachers can join two or more phrases together.
* Tutting: <https://www.youtube.com/watch?v=lrluSO-Qs0E>

During a safe dance warm up, the teacher will explicitly teach the learnt dance phrase/section, which students will learn through imitation and repetition. Similar to the previous stage, students will devise a way of notating the phrase/section, now highlighting symmetry and asymmetry.

Students will work in groups of three to five to develop a choreographic intention around the concept of identity. Students will manipulate the learnt phrase/section into a formal structure using over-arching forms of binary, ternary, or rondo, by experimenting, trialling, and evaluating, to best express their intention. Students will use the learnt phrase/section as the main movement vocabulary for their experimentation, and can add their own movement vocabulary where relevant.

For the purpose of this activity, the focus will be on recognising and using over-arching forms of binary, ternary, and rondo. Throughout this stage, the teacher will facilitate students’ selection of a piece of music or soundscape, and analysis of the formal structure, to assist with understanding and constructing the form of their dance. In manipulating the learnt phrase/section (and additional movement vocabulary, where relevant) in alignment with their selected form, students will manipulate at least two group structures (of symmetry, asymmetry, unison, contrast, and canon) to express their intention. Students will annotate their group structures, and prepare to explain and demonstrate their reasoning for their selection and manipulation to express their intention.

To conclude this stage, the teacher will join two groups together. (If there is an odd number of groups, one group of students will present to the teacher). The students will verbally share their choreographic intention and the choice of form with the other group, discussing how they believe their form is suitable to express their intention. The students will also share their notation of the phrase/section, highlighting symmetry and asymmetry to the other group (or teacher).

To extend the activity, the teacher can direct students to explore patterning through the use of a selected choreographic device(s), to assist in expressing their choreographic intention. Choreographic devices that involve patterning include:

* Accumulation: 1, 12, 123, 1234 (i.e., the addition of a new movement each time)
* Repetition: 123, 123, 123 (i.e., the same movements repeated)
* Retrograde:1234 becomes 4321 (i.e., movements within a phrase or sequence are presented in reverse order)

### Stage 3: Student Evaluation

The teacher will facilitate the presentation of students’ ideas to each other. Student presentations could be oral presentations of their notations, video presentations of annotated phrases, or fully rehearsed performances. The purpose of presenting ideas to each other is so that presenters have the opportunity to articulate their conceptualisation of expressive use of relationships to an audience, and so that the audience has the opportunity to observe a variety of interpretations of expressive use of relationships. After each presentation and/or performance, the teacher will facilitate student reflection focussed on the students’ ability to express a choreographic intention through the safe use of:

1. Symmetry and asymmetry
2. Form and formal structures
3. Canon, contrast, and unison

Students will co-construct success criteria and record reflections on how the relationships have been manipulated to express their group’s choreographic intention. Students will discuss and evaluate their use of relationships and form, verbally or in their journals. Students will also provide peer assessment of other groups’ performances, from the co-constructed criteria, in the teacher-facilitated student reflection after each performance.

## Table 1: Links to the Victorian Curriculum – Dance

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| Strand and Sub-Strand (if applicable) | Content Description (Code) | Elaboration(s) |
| Explore and Express Ideas | Develop their choreographic intent by applying the elements of dance to select and organise movement(VCADAE034) | Experimenting with different elements of dance to explore ideas and develop a choreographic intention for example, translating rhythms and notations of spatial patterns into movement |
| Dance Practices | Structure dances using choreographic devices and form(VCADAD036) | Selecting, combining, refining and sequencing movement using choreographic devices such as transitions, variation and contrast and choreographic forms such as binary, ternary and narrativeAnalysing and evaluating structural choices made by documenting their process in a journal, blog or video recording, securing permissions as necessaryResponding to feedback by changing aspects of the dance to enhance communication of ideas, for example, by changing the order and pattern of dance movement, phrases or sequences or by using choreographic devicesUsing collaborative planning, selection and evaluation process to structure group dances |
| Respond and Interpret | Analyse how choreographers use elements of dance and production elements to communicate intent(VCADAR038) | Identifying and interpreting how interrelating elements, choreographic devices such as variation, contrast and transition and forms are used to communicate intent |

## Table 2: Links to the 21st Century Numeracy Model (Goos et al., 2014)

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| Aspect of the Model |  How This Aspect is Addressed by the Lesson |
| **Attention to Real-Life Contexts*** Citizenship
* Work
* Personal and Social Life
 | In this lesson, students consider how notating dance movement and phrases in specific spaces involves employing mathematical concepts such as measurement, scale, and angles. Expanding students’ appreciation of relationships in dance (e.g., canon, contrast, unison, asymmetry and symmetry) develops a deeper understanding of personal connection to space and others. Students are afforded experience in notating dance works, which is a transferable professional skill to other art forms, including animation and computer-generated imagery. |
| **Application of Mathematical Knowledge*** Problem Solving
* Estimation
* Concepts
* Skills
 | In this lesson, students embody mathematical concepts such as space, shape, dynamics, and time. Students’ problem-solving skills are developed through recognising and manipulating patterns of movement and sequences to express a variety of intentions. Students apply mathematical knowledge and skills when manipulating concepts such as the elements of movement (time and space/shape) to convey their choreographic intention. Students develop skills in recognising and physically demonstrating dance relationships such as canon, contrast, unison, asymmetry, and symmetry to communicate an intention.  |
| **Use of Tools*** Physical
* Representational
* Digital
 | Students use self-devised symbols to represent the movement of their bodies, and to measure and record/notate their use/choice of the elements of dance: time, space, and relationships. Students use calculators to calculate the performance space of dance works choreographed by others. |
| **Promotion of Positive Dispositions*** Confidence
* Flexibility
* Initiative
* Risk
 | Students use initiative to estimate the dimensions of a performance space, and problem-solve the specific spatial opportunities and limitations with regard to size and scale that emerge when notating their own dance works and the works of others. Students will develop confidence in numeracy by using real-world measurements and calculations as they work creatively with spaces and choreographic intentions, individually and collaboratively. |
| **Critical Orientation*** Interpreting Mathematical Results
* Making Evidence-Based Judgements
 | By interpreting others’ notations, students employ mathematical thinking to analyse and evaluate the symbols in others’ dance works. |

## References

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