The Australian Ballet Education and Outreach

Jasmin Dwyer

Producer, Education & Outreach

Kennedy Patch

Associate Producer, Education & Outreach

This resource is offered free under the Creative Commons licence 4.0 by ATTRIBUTION/NON COMMERCIAL/NO DERIVATIVES

Government Partners

Foundation Partners

Principal Partner

Why Dance?

- Dancing is a holistic artform that involves not only the physical self, but also the intellectual, emotional, and artistic self (Bannon 2010; McCutchins 2006:64)

- The mind and body are not separate entities, they work in synchronicity with each other and offer optimum comprehension, conceptualisation and application when embodiment has a strong place in the learning sequence; much like the effect that handwriting notes has on retention levels, compared to typing them on a laptop (Dr Frank Wilson, cited in Symons 2018).

- Studies have shown that students who frequently participate in the arts are "more academically engaged...and motivated...and also have higher self-esteem..and a greater sense of meaning in life." (Australia Council for the Arts)

- It's fun!! It encourages critical & creative thinking in an engaging way.

Elements of Dance

SPACE (size of movements, level, size of group, locomotor or axial, pathways, angular/curved)

TIME (rhythm, speed, duration)

DYNAMICS (energy, force)

RELATIONSHIPS (eye focus, formations, relation to others or the space)

Dance and Maths

- Geometry and shapes
- Measurements and mapping
- Symbols that represent concepts
- Counting, patterns, sequences
- Noticing and describing relationships, similarities and differences.
- Chance and probability

Dance can be….

the mode of research/exploration

a way to visualise a mathematical concept

a mode of assessment

embodied knowledge required to achieve a dance skill

Anatomical Warm Up

A good warm-up is designed to prepare the body and the mind to participate safely and efficiently in the activity you are preparing for. In the case of The Australian Ballet, a warm-up is done to prepare for a ballet class, rehearsal or performance.

A thorough warm-up **starts small, gradually increases in size and energy**, and **warms up all the parts of your body.**

Why do we warm up?

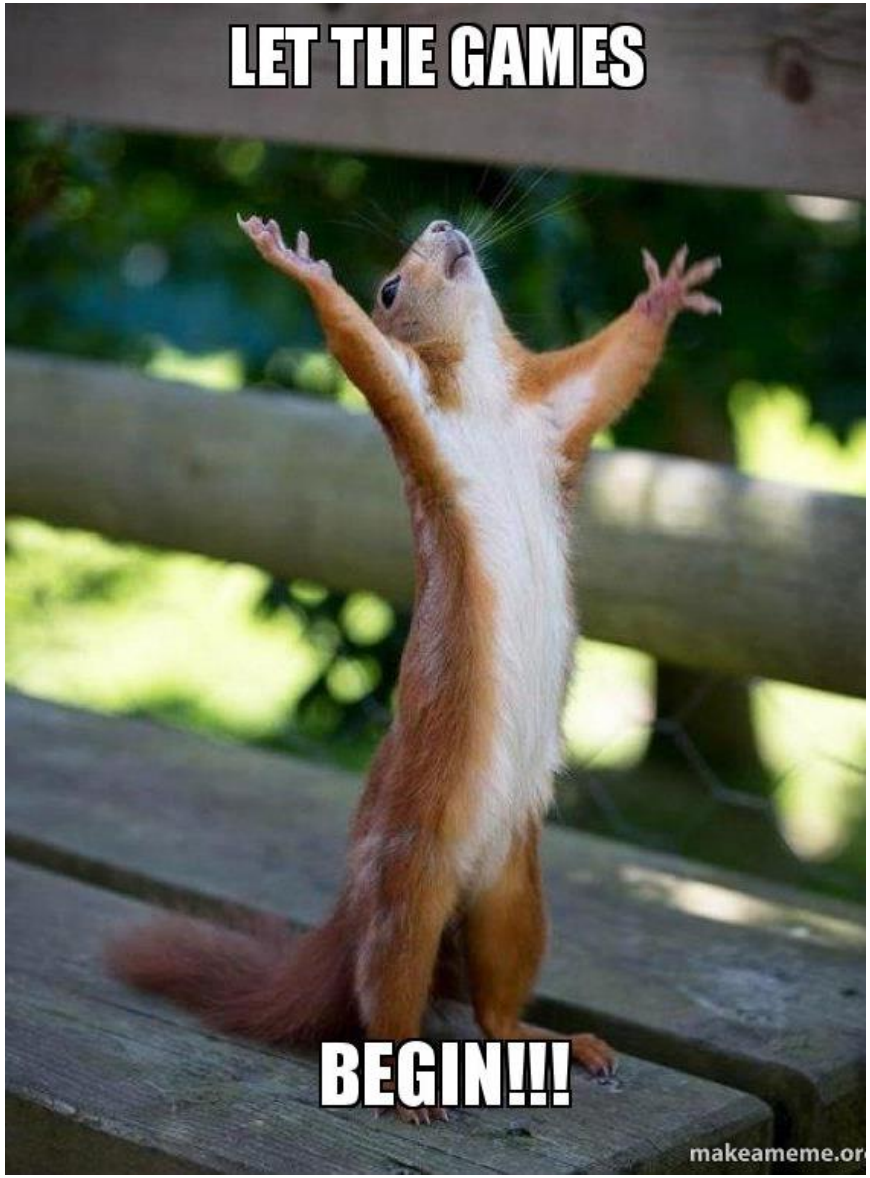
- **The aim of a warm-up is to increase:**
- blood circulation
- heart rate
- muscle temperature
- speed of nerve impulses
- the ability of joints to absorb shock

- **A warm-up also:**
- helps to prevent injury
- assists us to perform movements with more ease and efficiency
- provides an opportunity to focus the mind ready for activity

We have some follow-along warm-up videos here: www.australianballet.com.au/education-resources/classroom-warm-up-activities

How can games help us make movement?

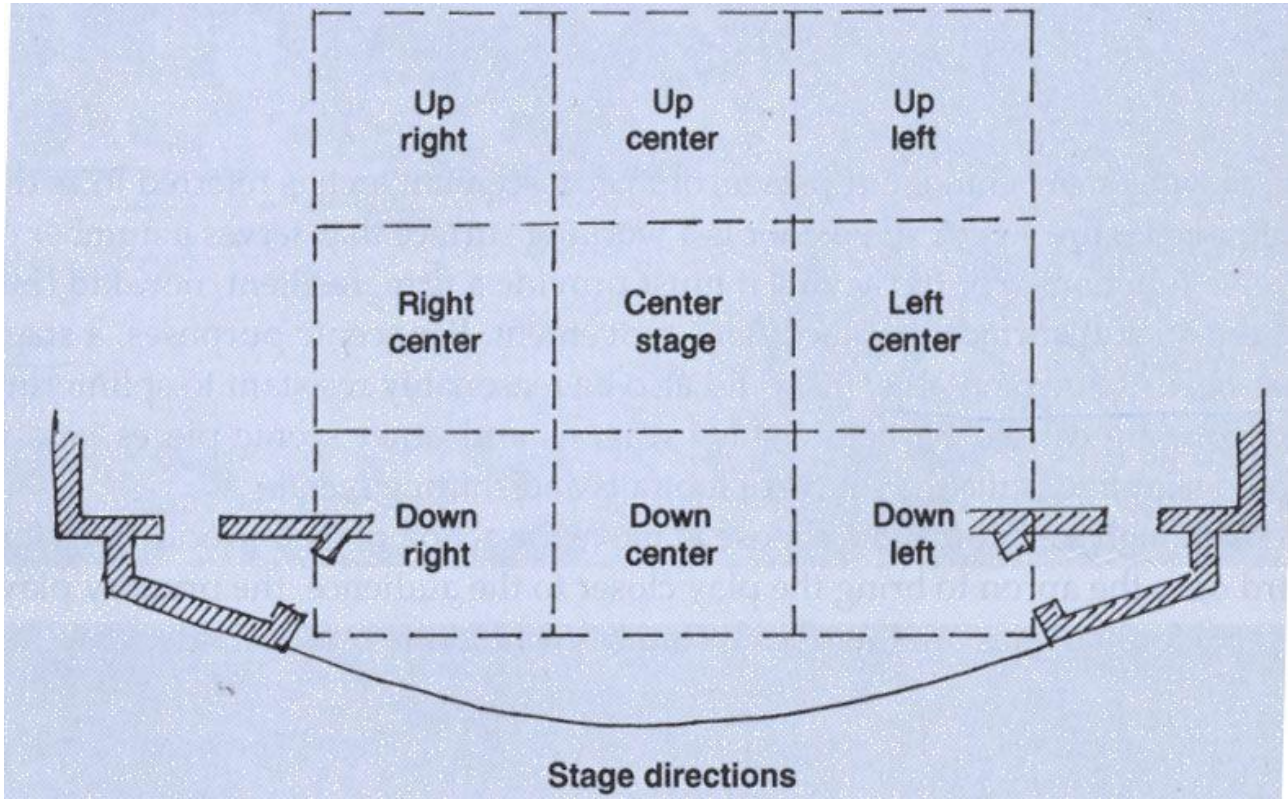
- Breaks down barriers
- Team-work
- Physicalizing a concept often makes the penny drop
- Provides a link between play/improvisation and the outcome of placing the child in the role of choreographer with you as director.



STEAMDANCE resource: games | The Australian Ballet

Stage craft and mapping

(Back of stage)



(Audience)

Potential Elaborations

- Splitting group by fractions and % (communicating without words to do it)
- Moving around keeping certain distances from each other (equilateral triangle)
- Make shapes as a group (2D, 3D, nets)
- Drawing a dance map and then following it (with directions like anti-clockwise, 3 small steps, diagonal slide etc, duration (speed/time), informal measurements (e.g. types of animals)

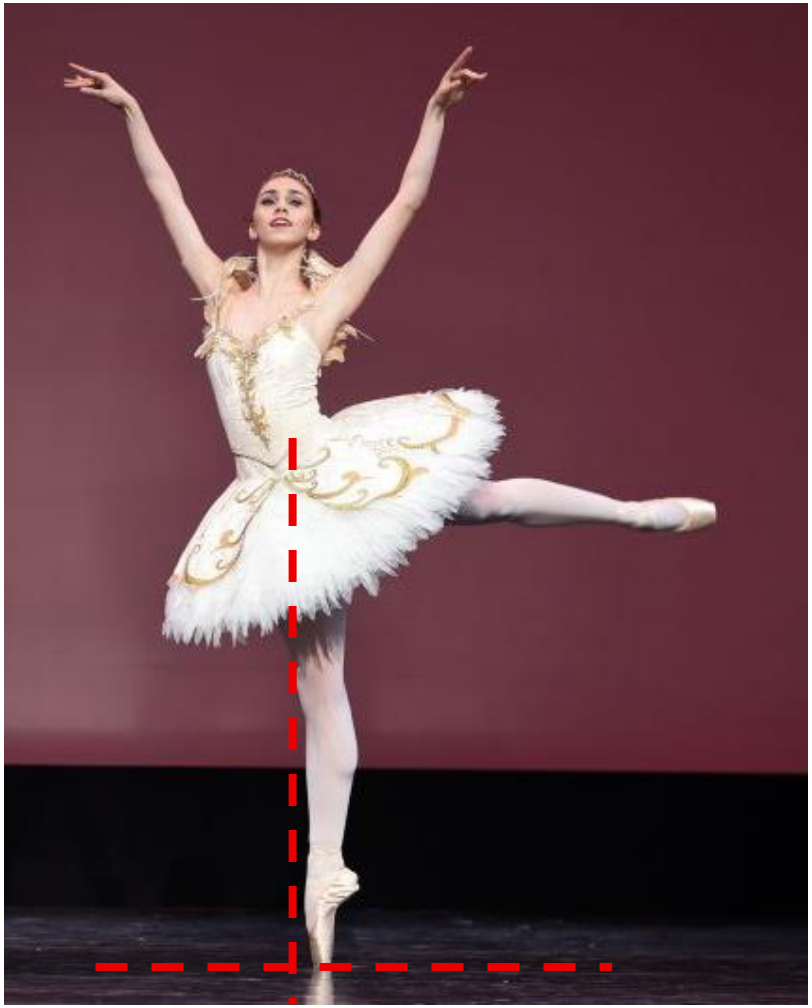
Shapes, lines, angles, symmetry

(Acute, obtuse, right angles)

(Parallel lines)

Body positions or actions dance

- Positions showing different lines and angles
- Same shape different direction. What would that shape look like lying down?
- Symmetrical and asymmetrical
-Each person or group creates a phrase that shows a particular series of angles/shapes etc
- Mirror or teach to a partner or other group.
- Reflect (what angles could we see? How could we make it more clear etc etc)



(Perpendicular)

Spotting and turning

- 1/4, 1/2, full turns
- 90, 180 and 360 degrees
- 25%, 50%, 100%
- Tour en lair (turn in the air)

Group Formations

1/4, 1/2, whole of group

Parallel lines, diagonals

Act out fibonacci sequence, prime numbers etc to make patterns

Adding, subtracting, rounding

- Dance an equation (e.g. 4 pairs of birds = how many in a flock / 4 x 2 = 8).

- Working backwards when making choreography. “We have 3 people, then next section needs 10, how many extra do we need? / 3 + x = 10

- Dance Dance Evolution - rounding
- Dance Battles – addition or subtraction

from Heather Francis

Chance and probability

- Used in dance (especially post-modern dance) to create unique and unexpected combinations, within a structure. E.g. Merce Cunningham, William Forsythe, Trisha Brown.

- Simple version = movement code e.g. assign movements to numbers 0-9. Then order in number sequences e.g. phone numbers, dates, pi, fibonaci.

- Using a dice, or flip of coin.
- Then calculate probability of getting certain movements or types of movements.
- How many combinations are there?

Example – coin flip

"how many combos exist"
"what is the chance of doing a big, flowing jump?"
"what is the chance of doing a small movement"?"
- then try, document and test reality vs probability

Movement	Size (heads = big, Tails = small)	Quality = (heads = sharp, tails = flowing)
Jump		
Spin		
Slide		
Balance		

Similar example – Sarah Chance Gesture Dance
bridges2013-337.pdf (bridgesmathart.org) (p.342)

Laban's 8 Efforts (an example from contemporary dance theory)

Direction	Time	Weight	Effort Action
direct	sudden	strong	punch
direct	sustained	Strong	press
direct	sudden	light	dab
direct	sustained	light	glide
indirect	sudden	strong	slash
indirect	sustained	strong	wring
indirect	sudden	light	flick
indirect	sustained	light	float

how many combos of direction/time/weight
2 x 2 x 2 = 8

Likelihood of choosing glide if flipping a coin for each element
½ x ½ x ½ = 1/8

Example – DICE

"how many combos exist?"
"what is the chance of… doing a movement on the spot? ..doing a slow movement?"

DICE ROLL	MOVEMENT	QUALITY	SPEED	SIZE
1	Jump	Swinging	Very slow	Short
2	Spin	Suspended	Slow	Middle
3	Slide	Vibratory	increasing	Tall
4	Balance	Percussive	Fast	Narrow
5	Roll	Collapsed	Very Fast	Wide
6	Run	Sustained	decreasing	Changing

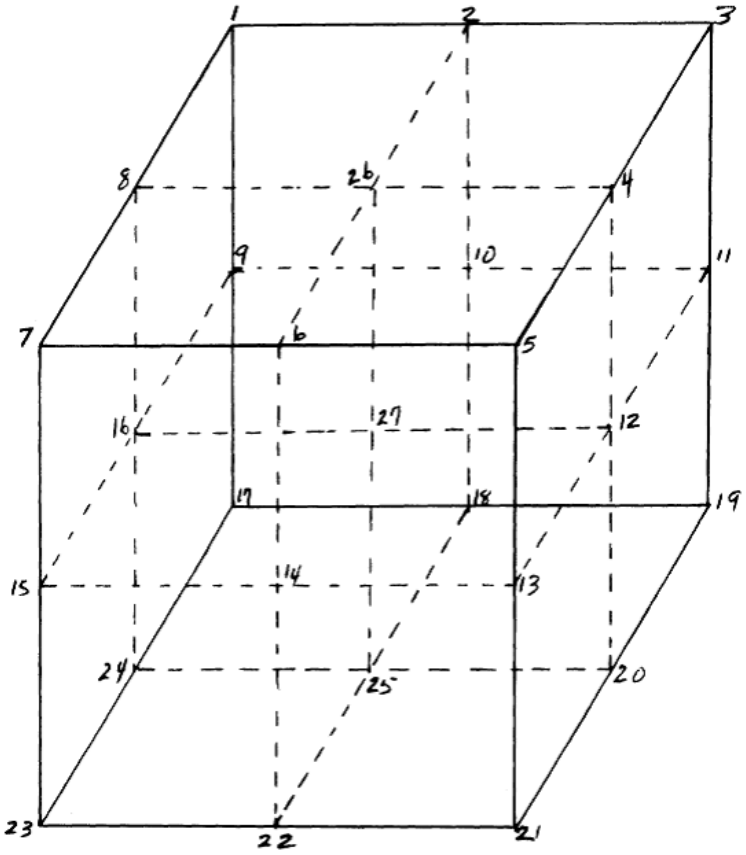
Keep rolling dice for as many moves as you need…
E.g.

- short, very slow, swinging, jump
- Tall, percussive, balance, increasing in speed
- Etc, etc until you have a phrase

Conceptual Task (Sequencing and chance)

- **Locus – Trisha Brown**

- *A cube structure assigned letters and numbers – a choreographic tool*



Structuring and assessing
(for dance and math outcomes)

Link movements into a phrase

Choose/manipulate space, time, dynamics, relationships based on the intention of your dance

Demonstrate chosen concept (e.g. angles, symmetry, correct answer to an equation if that is your aim

Reflect (and refine) as a group or individual

Choreographic tricks: Form!

Putting a dance together is about making choices and editing in ways that help make meaning from the movements

Actions - What are you doing?

Qualities - How are you doing it?

Spatial qualities -Where are you doing it?

Relationships - What does that picture say?

CRAFT: Create: Review: Reflect: Revise

What could we add to improve/refine it?

***important: what is the intention?? To show a math concept, or to make a fun dance, or to tell a story. This directs your choices/reflections.

Example structure

Use pathway from the mapping game.

In each new place show stillness in a position (90 degree, diagonal, parallel)

Duet demonstrating symmetry.

Probability dance, in groups of 25% of class, 50%, 100%.

Finale showing different turns.

References/further reading

- Math dance: Erik Stern and Karl Schaffer at TEDxManhattanBeach – YouTube
- Math Dance – YouTube
- Maths, story and dance: an Indigenous approach to teaching - ABC News
- Moving Mathematics Materials | Heather Gemperline Francis (heatherfrancisdances.com)
- bridges2013-337.pdf (bridgesmathart.org)
- Trisha Brown. " The imaginary cube and its points of reference "... | Download Scientific Diagram (researchgate.net)

Thanks!!

Please send through any feedback or questions by email to learning@australianballet.com.au

- Join our Facebook group for teachers + community leaders

Search on Facebook for "**STEAMDANCE ONLINE**"

- Explore our resources:

www.australianballet.com.au/eduhub

Filter: STEAMDANCE Resources for follow along warm up videos