



Dancing Our Way to Coding Using Patterning

Strands:	Suggested time
Algebra Social-Emotional Learning (SEL) Skills in Mathematics and the Mathematical Processes	100 minutes
Topic:	Grade:
Coding a pattern	4
Overall and Specific Expectations:	
Algebra ● C1. Identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts ○ C1.2 create and translate repeating and growing patterns using various representations, including tables of values and graphs ● C3. Solve problems and create computational representations of mathematical situations using coding concepts and skills. ○ C3.1 solve problems and create computational representations of mathematical situations by writing and executing code, including code that involves sequential, concurrent, repeating, and nested events Social-Emotional Learning (SEL) Skills in Mathematics and the Mathematical Processes ● A1. Throughout this grade, in order to promote a positive identity as a math learner, to foster well-being and the ability to learn, build resilience, and thrive, students will apply, to the best of their ability, a variety of social-emotional learning skills to support their use of the mathematical processes and their learning in connection with the expectations in the	

other five strands of the mathematics curriculum.

In these lessons, to the best of their ability, students will learn to **think critically and creatively** as they apply the mathematical processes of **representing** (select from and create a variety of representations of mathematical ideas (e.g., representations involving physical models, pictures, numbers, variables, graphs) and **problem solving** (develop, select, and apply problem-solving strategies), so they can make connections between math and everyday contexts to help them make informed judgements and decisions.

Learning Goals:	Success Criteria:
We are learning to : • create repeating patterns using physical movements and block codes to describe translations. • code a pattern that is sequential and loops (repeats).	I can : • create repeating patterns and model movements using my body. • identify the core of a pattern and name it as a loop. • code a repeating pattern to move an object in a loop.
Prior Learning:	Resources and Materials:
Understanding how to write instructions to create a series of events using positional and directional language. Understanding how to use block code to create a sequence.	• Space for students to move freely • Device with access to Scratch • Projector/Speakers/Device to play youtube video • Paper/pencil

Learning and Teaching Activities:

Starting Learning	

Let's Dance! Find a place in the classroom where you can move freely. Watch the screen and follow the actions described in the song. As you are dancing, listen for connections to math learning.

Teacher may choose any song involving a familiar dance (e.g., macarena, chicken dance, cha cha slide, YMCA).

Following the dance, ask student the following questions:

- What math was involved in you dancing to this song?

Anticipated Responses:

- The dance repeats itself like a repeating pattern.
- The dance models patterns with more than one attribute (different moves -wave hands, jump, turn, etc.).
- The movements of the dance can be described as transformations like in geometry (slide, turn, flip...translate, rotate, reflect).
- The song has beats, rhythm and moves that can be counted.
- If the video shown was a go-noodle, cartoon or digital character dancing -
The video for the dance was created by writing a code.

As important mathematical vocabulary is used, write these in an anchor chart and include an annotated visual model or example (e.g., CORE - the portion of the pattern that is repeated - e.g., slide left, back, hop, stomp, stomp, cha cha can be modelled mathematically as A B C D EE F)

Opportunities for Differentiation

Action part of the task can be completed as an unplugged lesson where students create a code on paper to describe their dance.

Action can be flipped; rather than write a code for a dance, students can read a code and perform the dance.

Opportunities for Assessment

Watch live or video performances with students and have them describe their pattern. The teacher can create a rubric to highlight key ideas, math vocabulary and mathematical thinking.

Active Learning

Lesson:

Teacher Moves:

1. Students will work collaboratively with peers to create simple, original, repeating dance. 2. On chart paper, students will describe, draw a diagram and name the core of their dance/pattern. 3. Students will translate their ideas into code using scratch blocks to code their pattern. Example	How might you change the costume? Speed? Background? Direction? Order of movements? Where are the coding tutorials to support your learning if you get stuck? What is more efficient; changing your code or changing your dance to make the two align?	
Consolidation of Learning		
Teacher selects student examples to show to students in order to highlight the following key ideas: • A pattern can be coded by repeating the series of block commands but using a loop to create repetition in a code is more efficient than repeating the block sequence. • Code animation is created using actions and costume changes. • Rotations can be achieved by repeating a turn 360 degrees.		
Further Consolidation/Next Steps for students and teachers:		
Students may perform their dances for the class. Share the code while annotating with a dance. Students can use each other's codes to try to learn each other's dances.		

Students can watch familiar dances on youtube and try to code the dances (plugged or unplugged).

Students can use two 4-sided dice to randomly make a dance pattern.

Students can code a program to do it for them to give left foot and right foot positions. Ask students how many pairs of numbers they would like in their dance pattern.

With the dance grid shown here, they will dance symmetrically (similar to the game “Dance Revolution”)

Dancers use single and pairs of numbers to make their dance. With this configuration, their movements are reflected.

1	2	2	1
3	4	4	3