

Tackling the Technology Gender Gap Together: Dance Dance!

Level – Second Level

**Subject area/s – Technologies - Computing
Science and Expressive Arts - Dance**



Everyday Computing Science – Breaking down Dance - Sequence, Decomposition and Abstraction

Level - Second

Subject area/s – Expressive Arts – Dance, Technologies-Computing Science

Experiences and Outcomes –

I can explore and choose movements to create and present dance, developing my skills and techniques.

EXA 2-08a

Understanding the world through computational thinking

I understand how processes work and their outcome. I can structure related items of information. TCH 2-13a

Understanding and analysing computing technology

I can explain core programming language concepts in appropriate technical language. TCH 2-14a

Designing, building and testing computing solutions

I can create, develop and evaluate computing solutions in response to a design challenge TCH 2-15a

Benchmarks –

2nd: Compares activities consisting of a single sequence of steps with those consisting of multiple parallel steps. Predicts what a complete program in a visual programming language will do when it runs.

2nd: Creates programs in a visual programming language including variables and conditional repetition

Duration of time – 7 x 50/55 mins

Computing Science Concepts and Approaches

Creating and Collaborating

Pupils will be involved in creating a dance to a piece of music, determining the key moves and then programming this as a program which takes input from the user to control the animation.

Pupils will collaborate to analyse a dance and break it down into teachable parts which they share with other groups to attempt to perform.

Sequence – understanding the

Decomposition - breaking down a larger problem into easier to solve problems

Algorithm - sequence of instructions or a set of rules

Abstraction - simplifying things; identifying what is important without worrying too much about the detail

Evaluation - making judgements

Resources required

Dance Dance 101 Intro Video:

<https://www.youtube.com/watch?v=fpmtw80kUAI>

Lego Sequence Morning Routine:

<https://www.youtube.com/watch?v=jMs3CfyW1Qw>

Tasty food video: <https://www.youtube.com/watch?v=Kh8wtAIUAGM>

Old School Uptown Funk Dance:

<https://www.youtube.com/watch?v=M1F0IBnsnkE>

Killer Dance routines: <https://youtu.be/zl0Z85hEYTM>

Scratch Dance tutorial: <https://youtu.be/RjGGQ85xyBs>

Scratch Dance tutorial 2:

<https://www.youtube.com/watch?v=W6RIRa108wc>

Space to dance

Internet Access, music files and presentation

Scratch online account

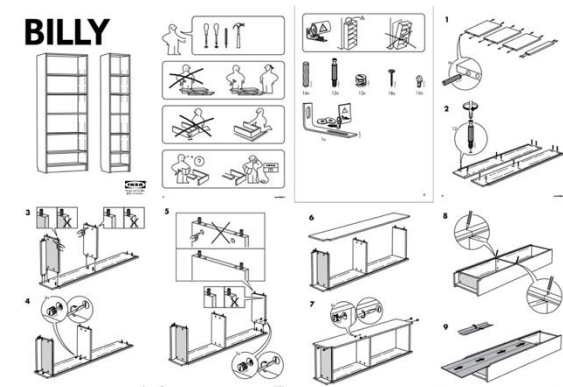
Speakers (for videos in presentation)

Digital Camera for taking images (or their own phone images if school allows BYOD)

Cable for image transfer

Overview of learning

In this block of lessons we look at key Computing Science concepts of Sequence, Decomposition and Abstraction through the prism of dance, looking at representation systems to describe movement before choreographing a piece of dance using the Scratch visual programming language. The block uses a range of videos to stimulate discussion and inspire.



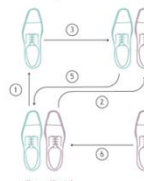
The social step pattern:

Man	Lady
1. Left foot forward	1. Right foot back
2. Right foot to the side	2. Left foot to the side
3. Left foot closes to right foot	3. Right foot closes to left foot
4. Right foot back	4. Left foot forward
5. Left foot to the side	5. Right foot to the side
6. Right foot closes to left foot	6. Left foot closes to right foot

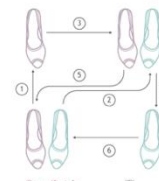
The Waltz

One of the most elegant and romantic dances of all time, the Waltz is simple to learn. Its basic rhythm is 123 123 (with emphasis on 1), danced to music with a slow 3/4 time, such as 'Kiss From A Rose' by Seal or any number of classical pieces - perfect for a first dance at a wedding.

His steps



Her steps



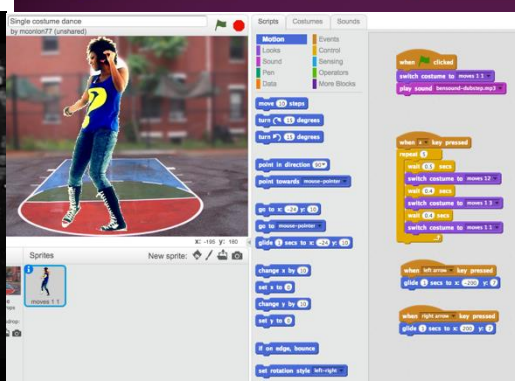
Start finish

Left foot Right foot

Karen says:

"The popular image of a man and woman waltzing, circling the dance floor, eyes only for each other, represents the epitome of romance and sophistication."

KAREN HARDY studios



Pupil Objectives

- I can...describe different techniques to represent choreography
- I can...design a routine using a representation system
- I can...use a visual programming language to create a dance piece to a chosen piece of music, using photos of key movement in dance
- I can....explain the key computing concepts of sequence, decomposition and abstraction

Introduction – 1 lesson

Using the presentation : Dance Dance 101 – Slides 1-16

We are introduced to the key computing science concepts of sequence, illustrated through different videos (links in presentation and embedded) , looking at different ways that sequences (and algorithms) can be described.

Slide 5+6+7 – pupils watch Lego movie sequence and discuss everyday sequences in their lives and then discuss the effects of incorrect sequences

Slides 8-14 – Pupils observe different representations of sequence and can attempt the Half-Windsor tie, discussing how each representation works.

Slide 15 – restates the key computing concept of Sequence

Slide 16 – Pupils attempt to follow this sequence and recognise the dance – Macarena and can complete the session dancing out the room !

Main Activity 5 – lessons – move to computing suite when past slide 26

Using the presentation : Dance Dance 101 – Slides 17-30

Slides 17-22 - Pupil study famous dances and consider what representation systems could be used to describe dance, understanding there are many ways to represent the same thing. Pupils have the opportunity to try a formal dances just by using a visual representation system.

Slides 23-24 – Pupils watch the CS Dance algorithm and then work in groups to describe the sequence of steps in a famous dance/dance sequence that they know having watched stimulus video. Pupils can try these out and have some fun trying to get them right. Pupils must create a breakdown of the steps and describe them using some form of representation system.

Slide 25 – introduces the pupils to the key concept of decomposition which they have just been doing – stress that this computing science skill is a life skill in all sort of areas, including dance.

Slide 26 – Pupil share with heir other teams who then have to attempt to perform.

Slide 27 – Pupils are introduced to the key concept of abstraction which they will have been doing during the previous and next task – simplifying a dance to it's most basic moves but still be recognisable.

Slides 28-29 Pupils will then create a choreographed piece using images that they import into a visual programming language using coding to animate the sequences they have planned.

The videos in the presentation demonstrate how to add a music track and then create code for each sequence of moves you wish to perform. The second of the videos demonstrates how to upload your own sequences and then use them in the choreographed piece.

Pupils should select the music they wish to perform with – the given tracks available as part of this unit or their won, created or purchased.

TOP TIP – SAVE OFTEN

Plenary - 1 lesson

Using the presentation : Dance Dance 101 – Slides 31

Pupils can now showcase their work to an authentic audience – other classes, or members of the school community and online. Pupils will be able to illustrate the key concepts of Sequence, Decomposition and Abstraction using their program.

Differentiation

Pupils can choose to use the pre-built animated characters within the Scratch platform
Pupils can use multiple backdrops as they explore the possibilities of the language.
Pupils can create other characters to dance at the same time as their own for a dance off or synchronised dancing with partners.
The lesson could be amended to work at early first level.

Assessment Opportunities

Copies of pupil's representation of their dance acts as an algorithm demonstrating sequence, decomposition and abstraction
Choreographed piece can be used as evidence for **EXA 2-08a** and the program code as evidence for **TCH 2-15a**

Teaching Notes

SEQUENCE: When we sequence things we arrange them in a particular order. Computer programs are built up of sequences of instructions. By following that particular sequence of instructions a task will have been completed. In our own lives every recipe or how-to guide is essentially a sequence of steps and instructions.

DECOMPOSITION: The process of breaking down a problem into smaller manageable parts is known as decomposition. Decomposition helps us solve complex problems and manage large projects.

This approach has many advantages. It makes the process a manageable and achievable one – large problems are daunting, but a set of smaller, related tasks are much easier to take on. It also means that the task can be tackled by a team working together, each bringing their own insights, experience and skills to the task.

ABSTRACTION: Abstraction is about simplifying things; identifying what is important without worrying too much about the detail. Abstraction allows us to manage complexity.

In a script for example the author does not give every precise detail of movement or facial expression. Maps are examples of abstraction – they give the key detail of the way the world is shaped and countries and capitals but it does not necessarily include complex geography, climate details or information about native species etc.