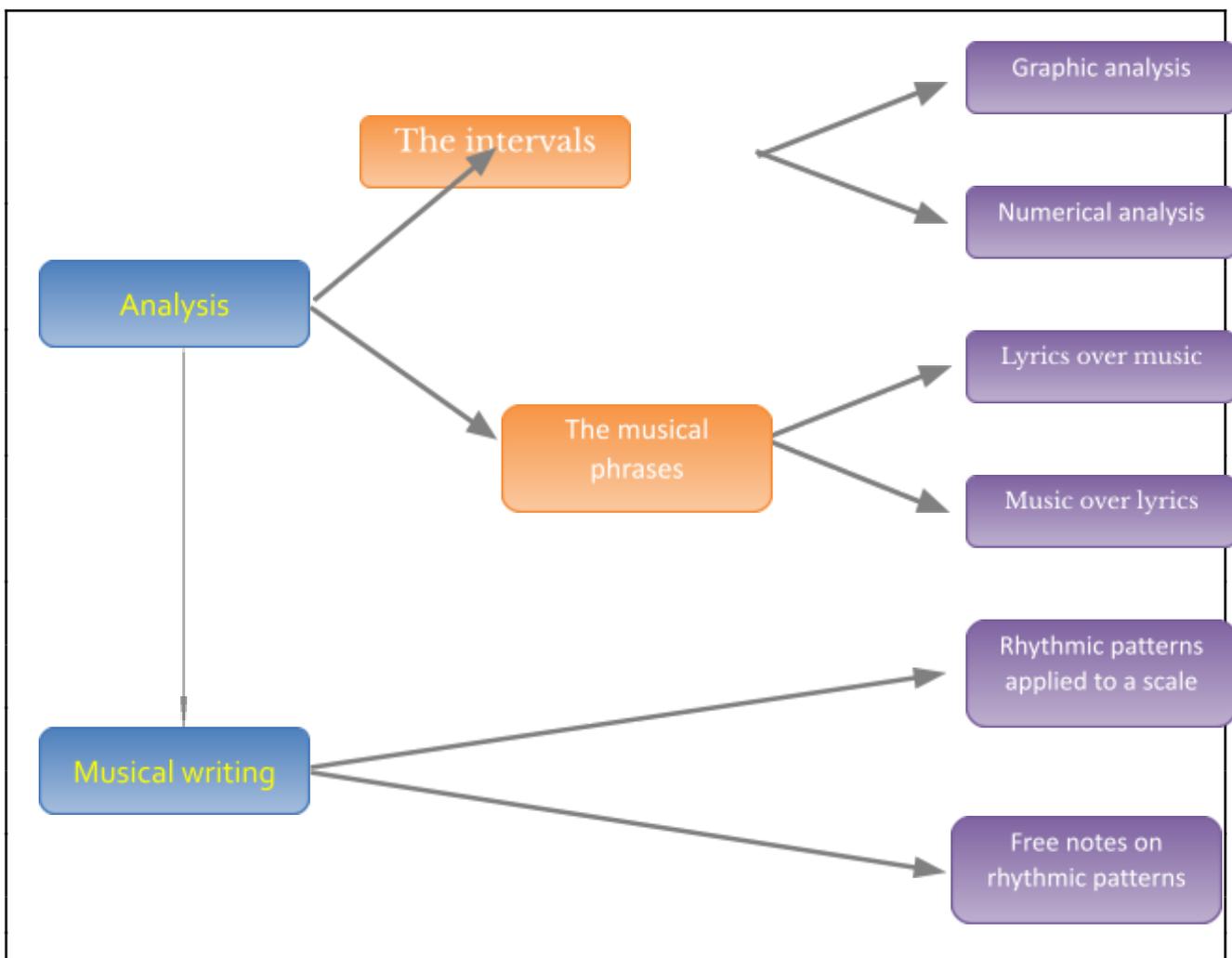


Didactics of musical composition

Summary scheme of the educational path (flowchart)



Age group: 9-12 years old

Number of hours: 5 hours

Short description of the activity: (maximum 4 sentences)

Pupils begin the educational path by analyzing famous pieces of music: they study the intervals used and understand the musical phrases by connecting them to the spoken language. They start writing their own melodies by applying given rhythmic patterns. They get instant feedback on their work using music notation software (eg. Musescore).

CT skills:

- ⦿ Data analysis
- ⦿ Data representation
- ⦿ Pattern identification
- ⦿ Debugging
- ⦿ Algorithms and procedures
- ⦿ Automation / visualization

Goals

- Students analyze a piece of music using a graphical analysis and a numerical analysis of how the notes relate to each other
- Students learn that a piece of music is made up of musical phrases, just like written text.
- Students place a song text over music
- Students place music over a text
- Students realize that rhythm is the basis for a melody
- Students apply rhythmic patterns to a scale
- Students write their own piece of music using notes and rhythmic patterns
- Students use an open source music notation software program such as MuseScore so they can listen to their work immediately.
- Learners apply computational thinking skills during the process (e.g., analyze data, pattern recognition, automation, debugging, algorithms - for details see methodology!)

Realistic STEAM-CT framework

Write your own piece of music using rhythm and melody!

(Brief justification of the STEAM integration)

Science	Technology - Engineering
Sound characteristics Relations between sound pitches Practical observation of harmonic sounds Study on the motion	Use of robotic devices Graphical representation in a system of coordinates
Mathematics	Art - Social Sciences
Numerical calculation of intervals Logical thinking Cartesian coordinate system Proportions Elements of statistics	Proportion and harmony in Art The symmetry Active listening Listening-related emotions Rhythm in Art Rhythm in Poetry Sound figures of speech in lyrics

Methodology

Part	Description	Timing
1	<p>Introduction</p> <p>How were the most famous pieces of music written? What "secrets" do the great composers use to make their melodies effective? How can you write a nice piece of music? The challenge to the pupils will be based on the following considerations: composing their own piece of music following the rules derived from the analysis of famous melodies.</p> <p>We will explain to the students that a melody, which can be considered the most important element in music, is a sequence of ascending and descending notes that follow a rhythmic pattern.</p> <p>In the discussion that we will start with the class, we will then anticipate the phases that will characterize our path. In fact, to achieve our main goal, we will have to break the problem down into parts.</p> <p>The first phase of analysis will concern the intervals between the sounds. We will then define the concept.</p> <p>After that, we will anticipate that the next steps will concern the analysis of musical phrases and finally the phases of actual creation, with the application of rhythmic patterns to the sounds.</p>	20'
2	<p>A melodic path (gamification activity)</p> <p>Integrazione STEAM integration : Maths – Technology – Engineering</p>	30'

We understand how the composers used to “move” the notes in their melodies.

We represent this motion graphically with the help of robotics.

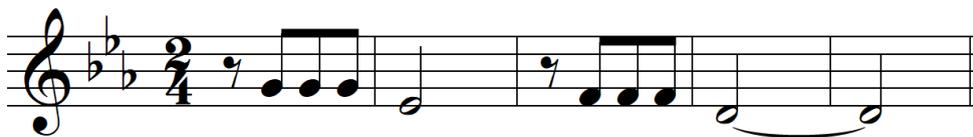
The students will analyze the direction of the notes of famous melodies by creating "musical paths" to be followed by a programmable robot (such as Ozobot, Mbot, etc.)



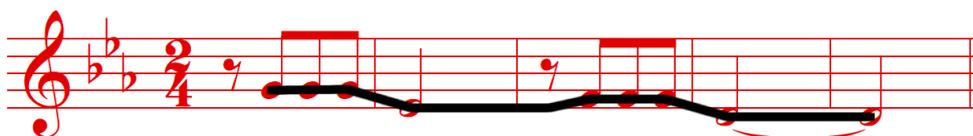
Example 1: Beethoven Sinfonia no.5 in C minor op.67

TASK (using, for instance, Ozobot):

After printing the first notes of the main melody:



Overlap the score with a sheet of tracing paper and ask pupils to follow the direction of the notes using a ruler and a felt tip.



Then replace the printed melody sheet with a blank sheet so as not to confuse the Ozobot detector. By removing the print, only the trace of the motion of the notes will remain:



Ozobot “color codes” will be used to underline conspicuous moments of the melody: for example, “cool moves” or “timers” can be used (see appendix 1).

Appendix 1: The color codes of Ozobot



ozobot.com

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Let's do the accounts...

Integration STEAM: Maths

60'

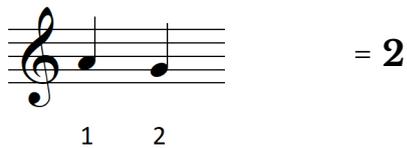
In this activity we will investigate the most frequently used numerical connections between sounds. The intervals will be quantified numerically by studying them from a statistical point of view.

We will begin by explaining that in music the interval between two sounds is measured by counting the notes that separate them, always including, in the count, also the first and last note.

Eg. the interval F-B, is calculated as follows:

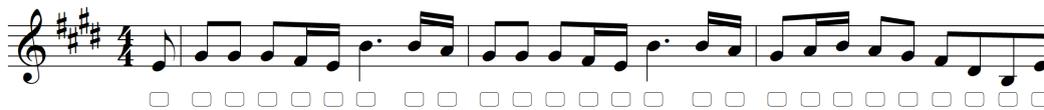
Or descending D-B:

Descending A-G:



TASK:

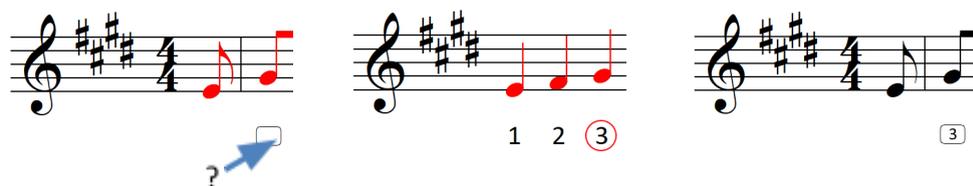
Scores will be distributed to the pupils with boxes under each note like this example:



We will also provide the key scale of the piece to be analyzed to help pupils in their calculations.



Pupils will have to write in the boxes the number of notes that separate two sounds by counting the notes in the middle (including the first and last note) as follows:



Pupils will be asked to mark a dash when the next note, compared to the previous one, has no variations in pitch. In the end you will get a job similar to the following example:



CT: Data analysis, Pattern recognition, data representation

Discuss with the class: Are there any recurring numbers? What is the most used interval? What numbers (in the range 2 to 8) are missing?

We will take care to use examples that include different types of intervals, to make the case history as varied as possible.

STEAM integration: Social sciences

Start by explaining to pupils that musical discourse is articulated in sentences, just like the spoken language. Knowing how to compose a song, in fact, means knowing how to create complete meaningful sentences. We will start from the analysis of the phrases of the great composers to understand how to create coherent musical periods.

Initially introduce the concept of musical phrase to pupils by listening to famous examples.

Mozart symphony #40 in G minor K550



Another example: J.S. Bach - Passacaglia and Fugue

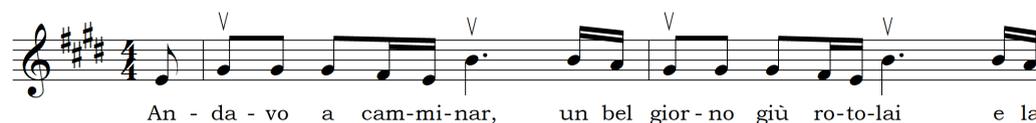


TASK: (in small groups)

Ask pupils to create a short text (lyrics) which will be added to a famous melody following these simple rules:

- assign a syllable to each note;
- ensure that the tonic accent of the words corresponds to a strong tempo of the bar (in time 4/4, for example, the accent falls on the 1st and 3rd movement of each bar);
- Ensure that the phrases of the text match the musical phrases.

Example on Vivaldi's "Spring" (the symbols "V" represent the strong accents of the bars).



CT: Algorithms and procedures, pattern recognition, debugging

During the first listening stage, how did you identify the various phrases? What does the composer do to make the listener understand that a sentence is finished? What difficulties are met with trying to make a text adhere to a melodic line?

<p>5</p>	<p>Let's create a melody starting from a text</p> <p style="text-align: right;">STEAM Integration: Social sciences</p> <p>TASK: (in small groups)</p> <p>Let's carry out the reverse procedure to activity no. 4: let's create a melody starting from a text. For example, we will choose some lines taken from a poem and we will proceed to create, on that text, a small melody:</p>  <p><u>CT: Algorithms and procedures, pattern recognition, debugging</u></p> <p>Am I making music whose phrases match the lines? How can I end a sentence? What do I need to do to give a melody a sense of "closure"?</p>	<p>30'</p>
<p>6</p>	<p>Let's go to the rhythm! (Analysis of the rhythmic structure of melodies)</p> <p style="text-align: right;">STEAM Integration: Maths – Social sciences</p> <p>Stimulate pupils' reflection with this theoretical introduction: if we play the notes of a famous musical theme by eliminating its rhythmic structure, we can often understand what song it is.</p>  <p>But what makes a melody unique is its rhythmic pattern.</p>  <p>Yes-ter-day, all my trou-bles seemed so far a-way,</p> <p>To understand what makes a melody original, therefore, it is also necessary to analyze its rhythmic structure. We will carry out this study by “extracting” from the melody only the rhythmic component in this way:</p>	<p>30'</p>

Yes-ter-day, all my trou- bles seemed so far a-way,

Another example: Melody with no rhythm

Melody with rhythm

Extraction of the rhythmic structure:

TASK: Ask students to extract the rhythmic sequence of a melody by copying it in the rhythmic staff on a score of this type:

Moderato

I see trees of green, red ros-es too, I see 'em bloom, for me and you. And I

Use tracks with different types of rhythmic structures, to make the case record as varied as possible.

CT: Data analysis, data representation, pattern identification

Are there any rhythm modules used more than once? How are they distributed? What makes them "unique"?

TASK: use a simple scale to apply rhythmic patterns chosen from those proposed in rhythmic table 1, taking care to use, on the last note, a figure lasting an entire bar.



Example of the application of some rhythmic modules to the notes of the scale: a simple melody is created.



Another example: a scale with interruptions of ascending motions.



The same scale with the application of various rhythmic modules



CT: Algorithms and procedures, debugging

Discussion / reflection: what are the rhythms that are well suited to the first bars? What rhythms fit the bars?

CT: Algorithms and procedures, debugging

Discussion: What doesn't "work" in our melodies? How can we improve them? What notes / rhythms give a sense of motion or rest? Have any leaps we used taken us to notes that were "extraneous" to the melody?

Activities 7 and 8 will be carried out using an open source music notation software such as MuseScore which, by giving students the opportunity to immediately listen to their work, will allow them to have immediate feedback and to be able to proceed for the method "trial and error".



Organisation:

Materials:

- Template with the rhythm codes
- Scores from the methodology
- Computers
- Software MuseScore

Use of ICT:

Children use MuseScore to compose and listen to their own piece of music.

Coaching:

Asking thinking and doing questions:

3. Let's count...

- Are there recurring numbers?
- What is the most commonly used interval?
- Which numbers (in the range 2 to 8) are missing?

4. Music is a language ...

- Did you recognize the different phrases while listening?
- What does the composer do to make the listener understand that a sentence is finished?
- What are the difficulties involved in ensuring that a text conforms to a melodic line?

5. A melody based on a text...

- Do I make a piece of music whose sentences fit the rules?
- How can I end up with a sentiment?
- What should I do to give a melody a feeling of "closure"?

6. The basis for the melody is the rhythm

- Are there "rhythm patterns" that are used more than once?

- How are they distributed?
- What makes them "unique"?

7. I choose the rhythm

- which rhythms fit well with the bars?

8. Write notes on predefined rhythms

- What doesn't "work" in our melodies?
- How can we improve them?
- Which notes / rhythms give a feeling of movement or tranquility?
- Did some of the jumps we used lead us to notes that were "foreign" to the melody?

Stimulating cooperation

Teamwork: groups consist of about 2-3 students

Formative evaluation

The assessment will be based on:

1. General observation by the teacher: group and individual processes and results
: Problem solution and critical reflection.
3. The achievement of specific objectives by the group in each of the parts of the process.

Adjustments:

Basic knowledge about music theory is desired here. See activity Rhythm is a dancer for age group 9-12y