Music Blocks Lesson Plan
Symmetry

Age:

7-12 years.

Lesson duration:

60 minutes

- Introduction: “What is symmetry?” (15m)
- Part 1: Invert (15m)
- Break (5m)
- Part 2: Retrograde (15m)
- Performance/Critique (10m)

Number of students:

Up to 10

Rationale:

Students will learn about symmetry and how it is commonly used in music.

Objectives:

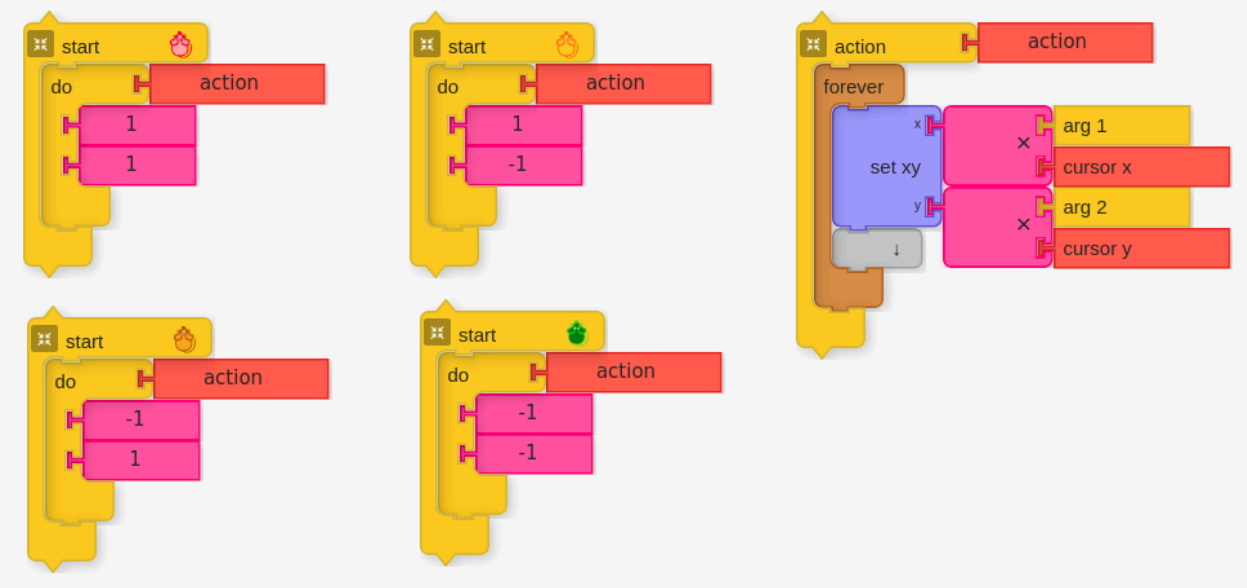
Students will explore the Click event handler and different ways to explore that mechanism in building interactivity into Music Blocks applications.

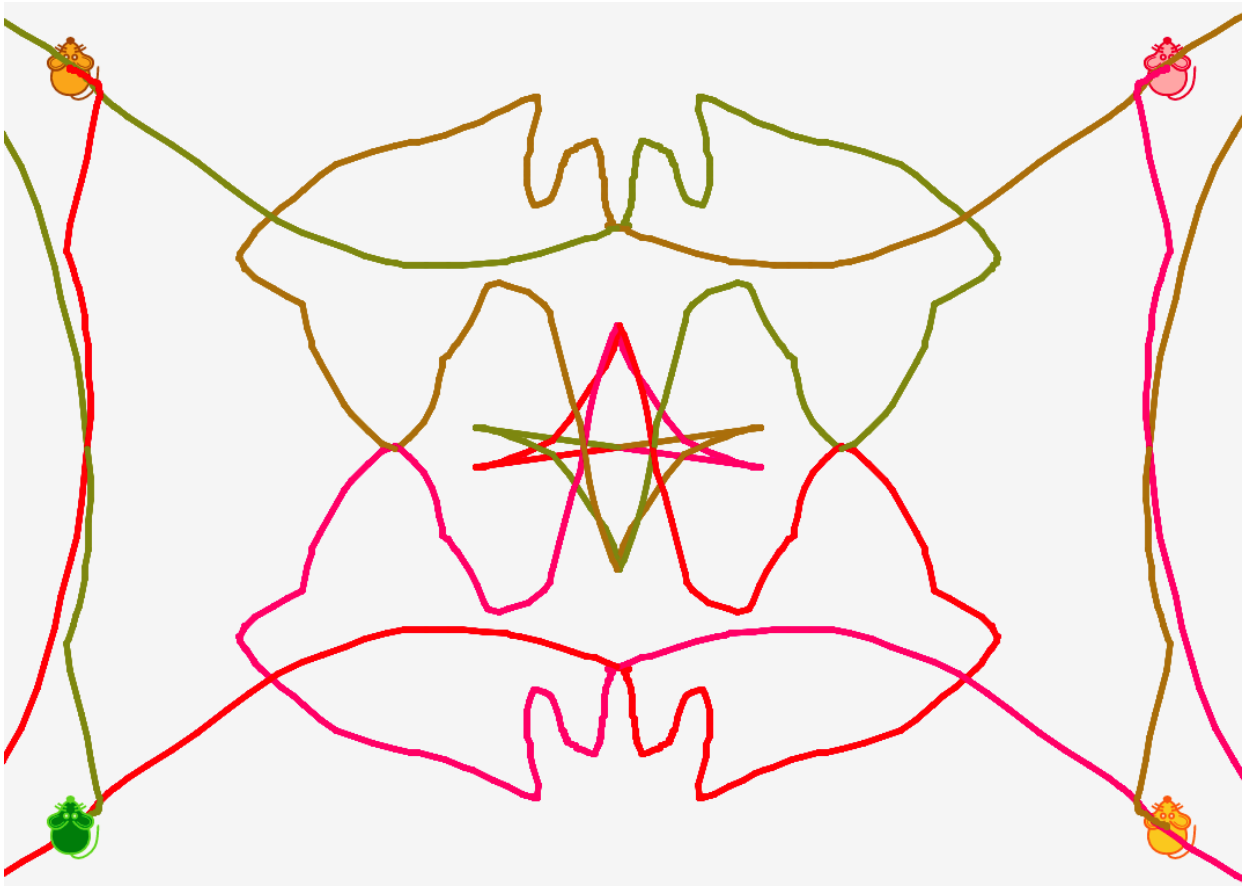
LESSON

Introduction: What is symmetry?

1. Begin by asking students to sit in a circle and explain that in today's lesson they are going to explore symmetry.
2. Start off by having each student describe what they think symmetry is. What are some examples of symmetry in the real world?
3. Using paper and pencil, make a pattern. Place a mirror up to the drawing and explore the symmetry of the reflected image.
4. Try drawing a symmetric pattern without the mirror.

5. Next, explore a symmetry paint program written in Music Blocks: https://musicblocks.sugarlabs.org/?id=1523389168734406



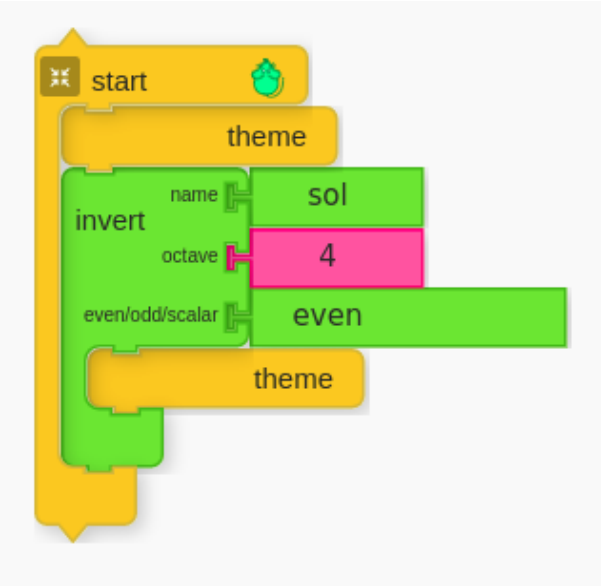


6. Discuss how symmetry might work in music. What if your left and right hands on a piano were to play in symmetry?

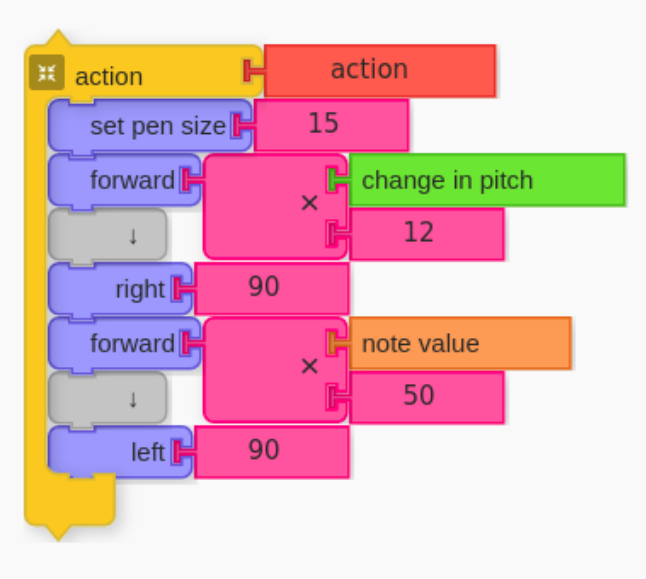
7. In Music Blocks, we'll use the Invert block and the Backward block to create two different types of symmetry.

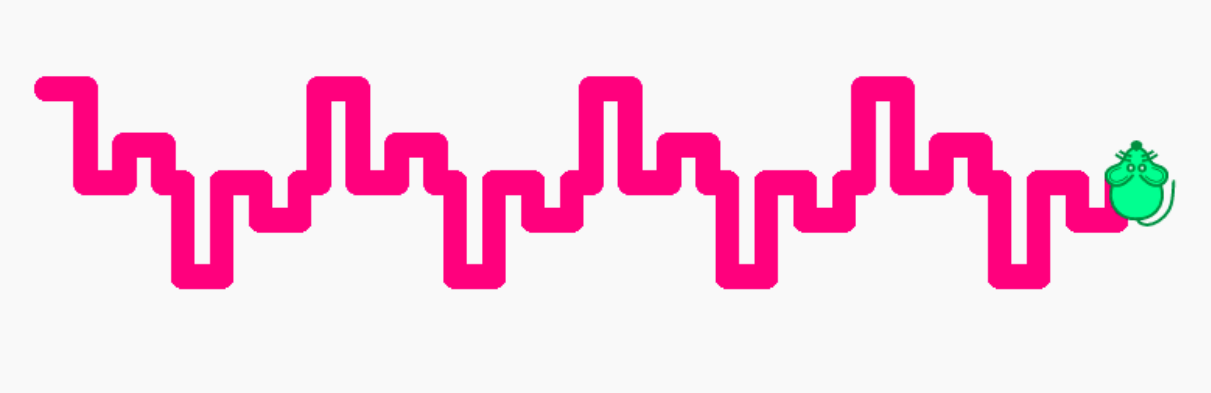
Part 1: Invert

1. Create a "theme" inside an Action block.
2. Play the theme from a Start block.
3. Using an Invert block from the Pitch palette, listen to what happens when your theme is inverted.

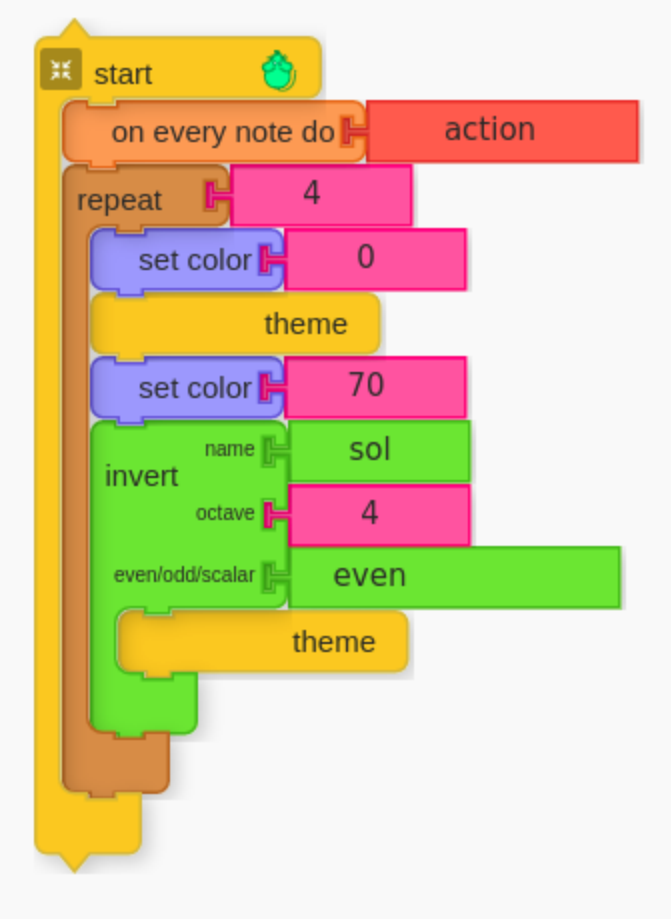


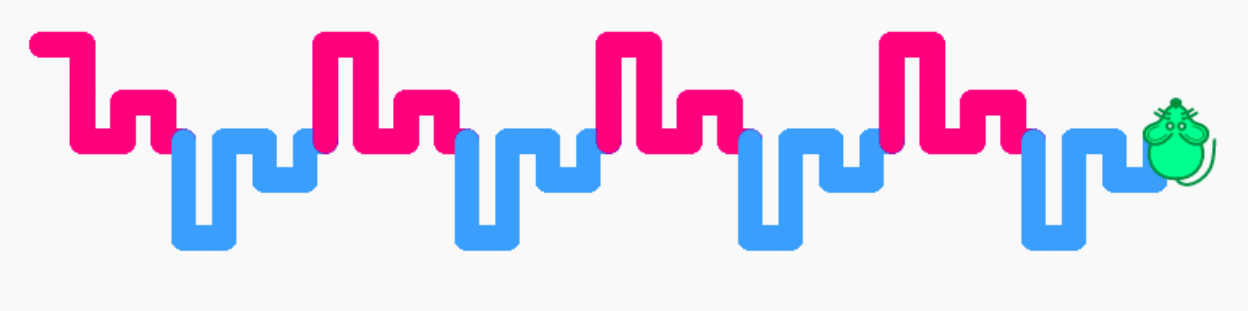
4. Using an On-every-note-do Block, trigger an action to draw the notes as they play.



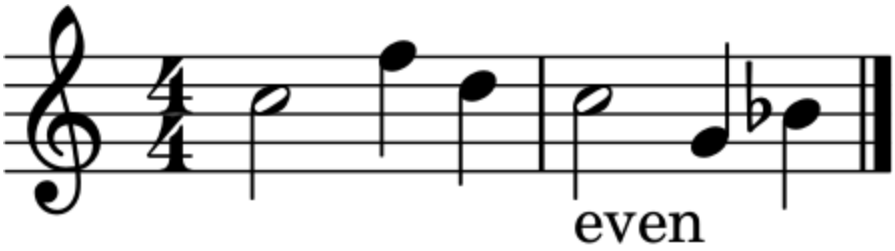


5. If you change colors in between, the symmetry is easier to see.





6. Discuss what is going on musically.

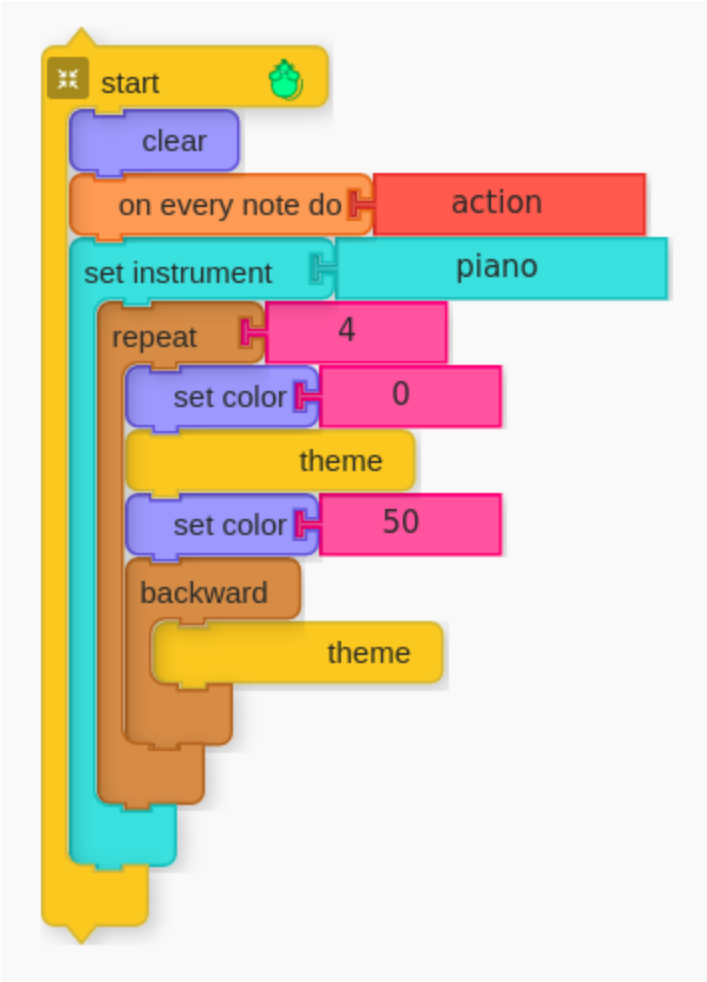


7. Explore using different values in the Invert block.

Break

Part 2 Retrograde

1. Retrograde is a fancy way of saying backwards. Playing your music backwards is another kind of symmetry which is common in music.
2. Play Bach's Crab Canon as an example. https://musicblocks.sugarlabs.org/index.html?id=1522885323588493
3. From the Flow palette, get a Backward block.
4. Use the Backward block in place of your Invert block. (Note that the Backward block will only play the outermost blocks backwards.)



5. Explore different combinations of Backward and Invert. Have fun.

Performance/Critique:

1. Have each student play their compositions and then talk about what role symmetry plays.
2. Engage in a discussion about more things that they could do with symmetry.

Key events:

- Introduction of key concept: symmetry.
- There is more than one type of symmetry.
- The students create their own variations on what it means to use symmetry.

Materials:

- Music Blocks software
- Paper, pencil, and mirror (optional)

Assessment:

- Observe participation.
- Do the programs make use of the concept of symmetry?
- Is there a creative use of symmetry?

MAP
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