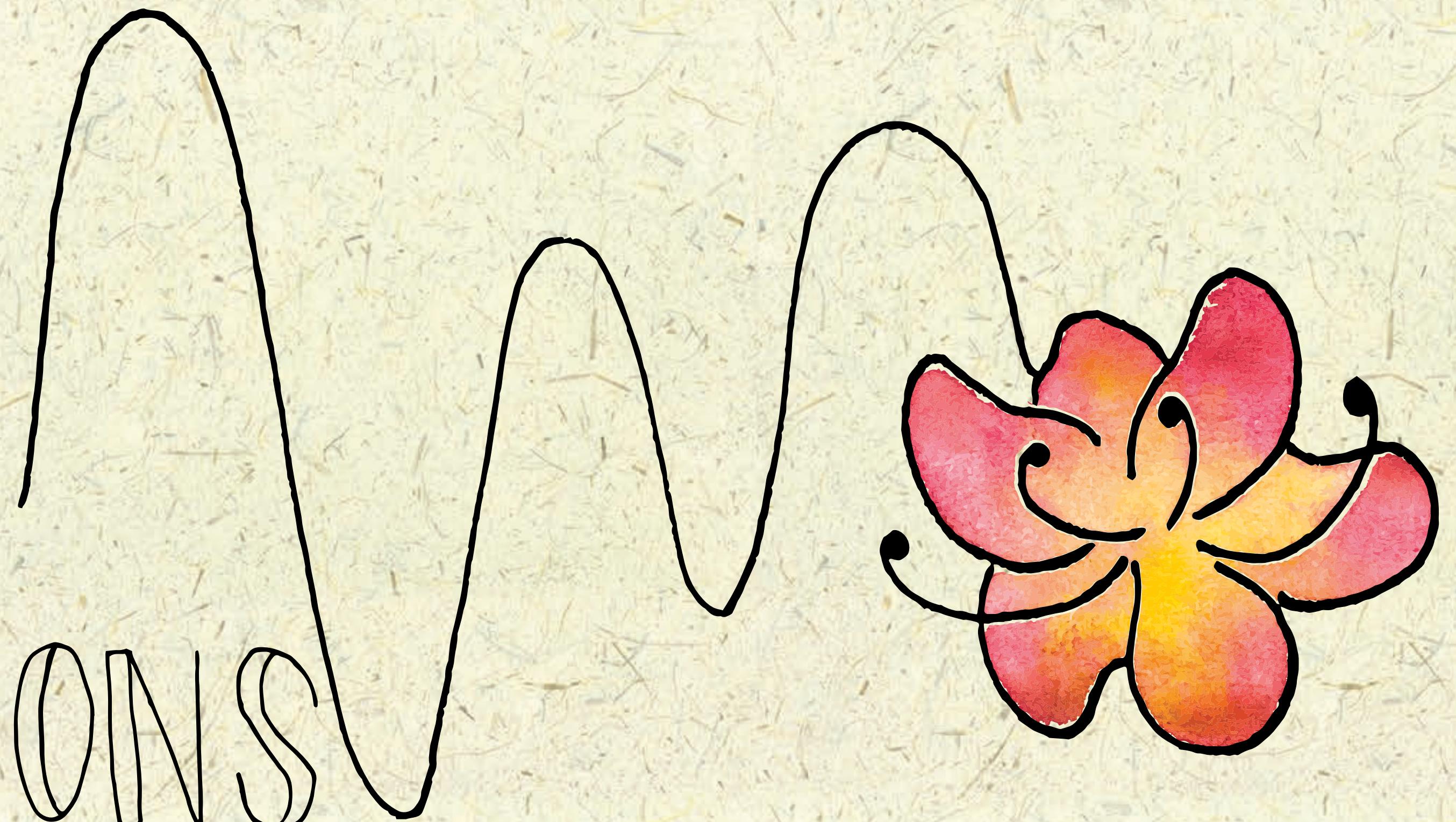


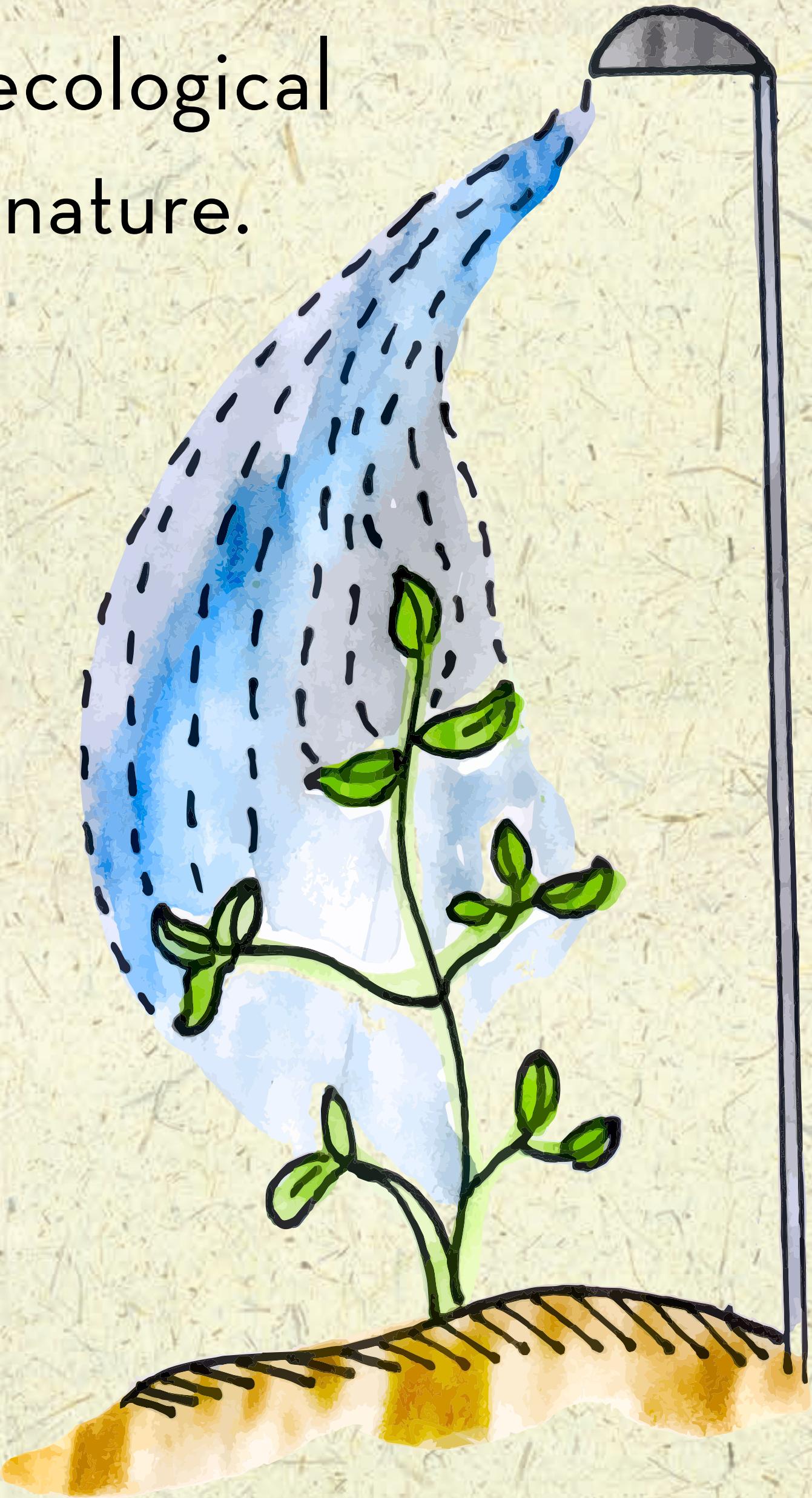
# BOTANICAL TRANSMISSIONS



TANVI DHOND | NOAH LITVIN | CHRISTOPHER LOPEZ

Our Anthropocene provokes questions regarding the ecological responsibility of humans and encourages us to nurture nature.

**Botanical Transmissions** is a curious exploration which blends design, sound, and data to complement nature.



A photograph of a scenic landscape. In the foreground, two people are sitting on large hay bales. On the left, a woman in a blue tank top and black pants wears sunglasses and carries a backpack. On the right, a man in a red polo shirt and a woman in a colorful floral dress sit facing away from the camera. Between them is a small body of water. Behind them is a wide, green, grassy field. In the far distance, a city skyline is visible through a hazy atmosphere.

RESEARCH

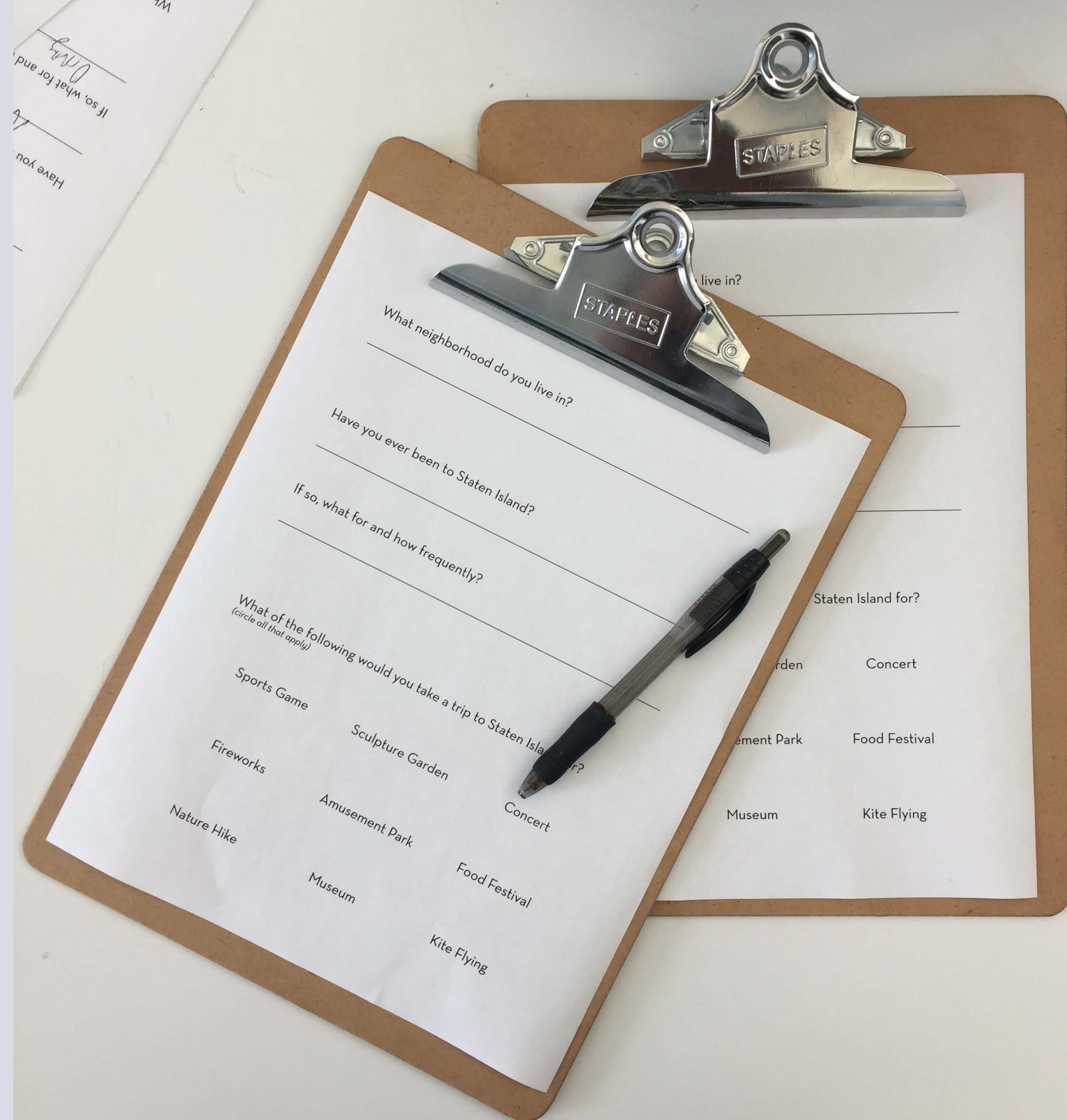
# Street Interviews

## LOCATION & TIME

Union Square Park, 10/3/16 at 1:15 PM

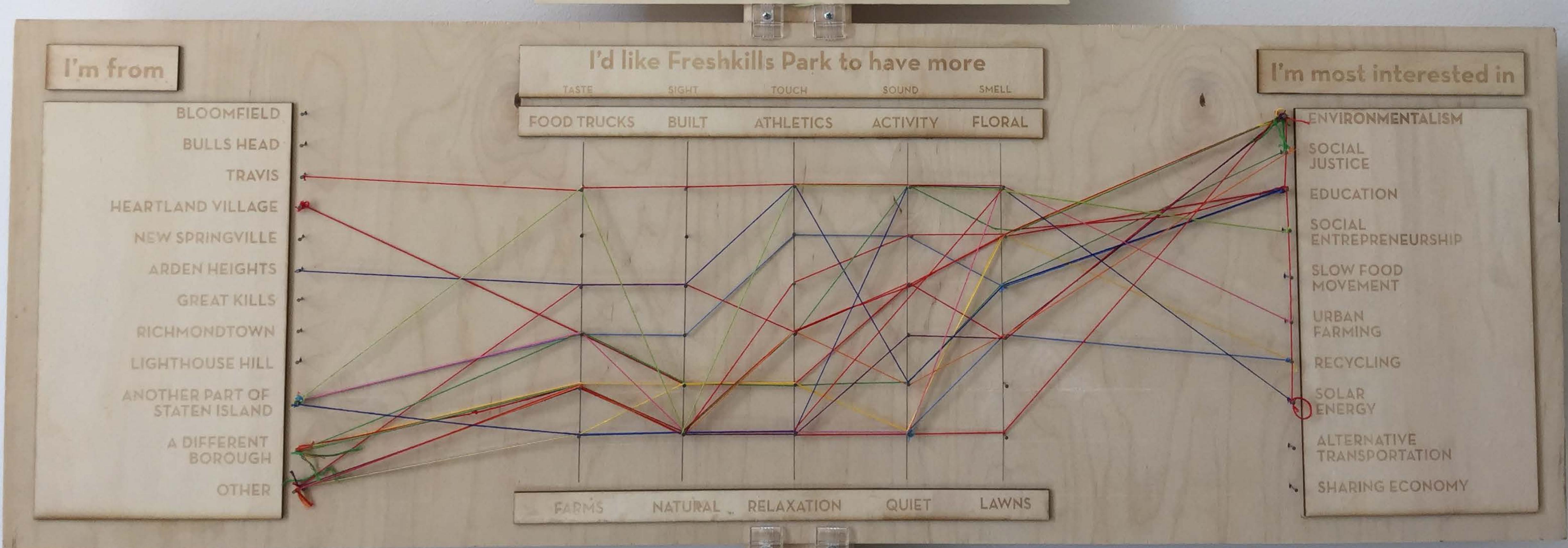
## INSIGHTS

- 15 responses
- One in three respondents have never been to Staten Island. The median respondent has been there once.
- The most enticing hypothetical attractions in Staten Island were **concerts** and **nature hikes**, followed by **sculpture gardens** and **museums**.



# Sensory Probe

## TELL US ABOUT FRESHKILLS PARK



# Sensory Probe

## LOCATION & TIME

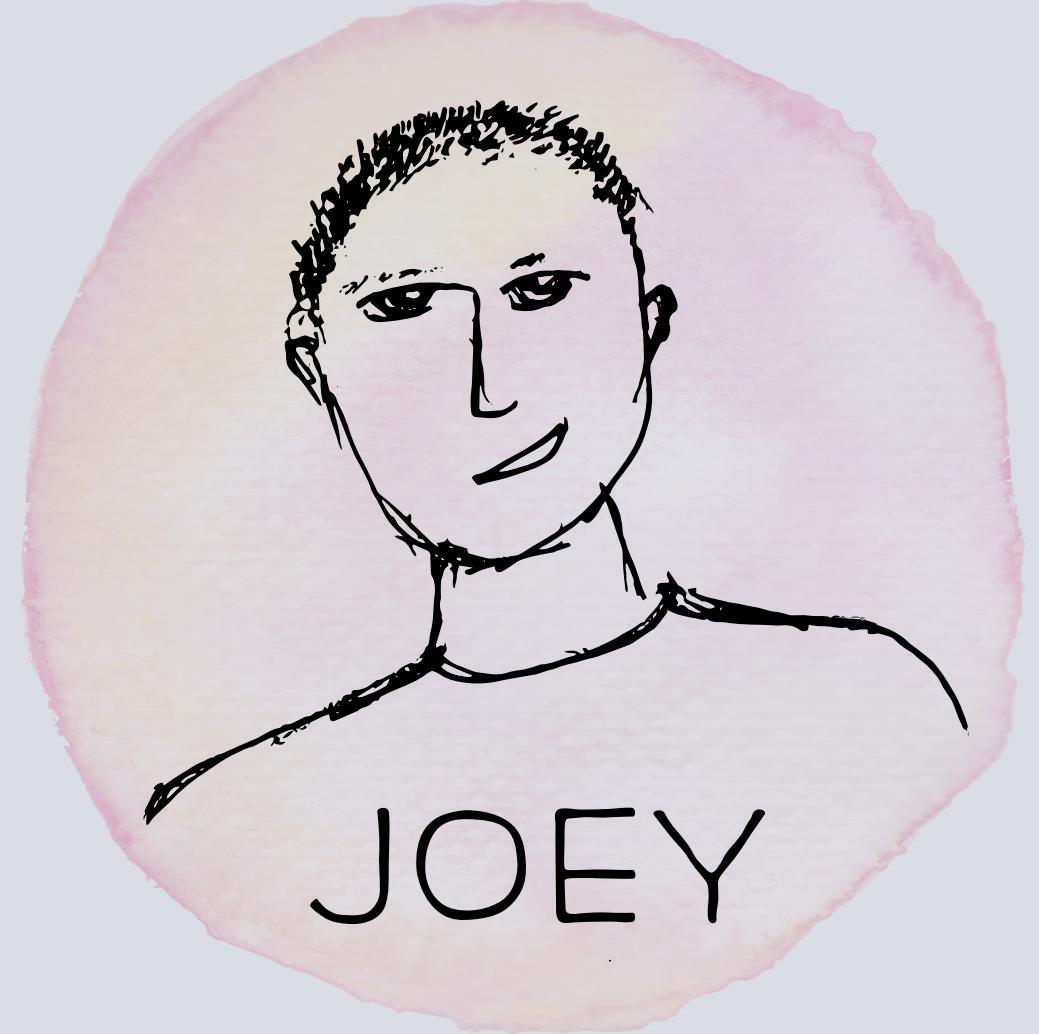
Freshkills Park, 9/18/16 at 2:00 PM

## INSIGHTS

- Access is an issue for both Staten Islanders and those in other boroughs
- Reported sensory experiences included brown grass, loud wind, and strange smells.
- Visitors prefer sights and tastes that evoke nature, floral scents, and varied tactile and auditory experiences.
- Visitors were predominantly interested in environmentalism, education, and social justice.



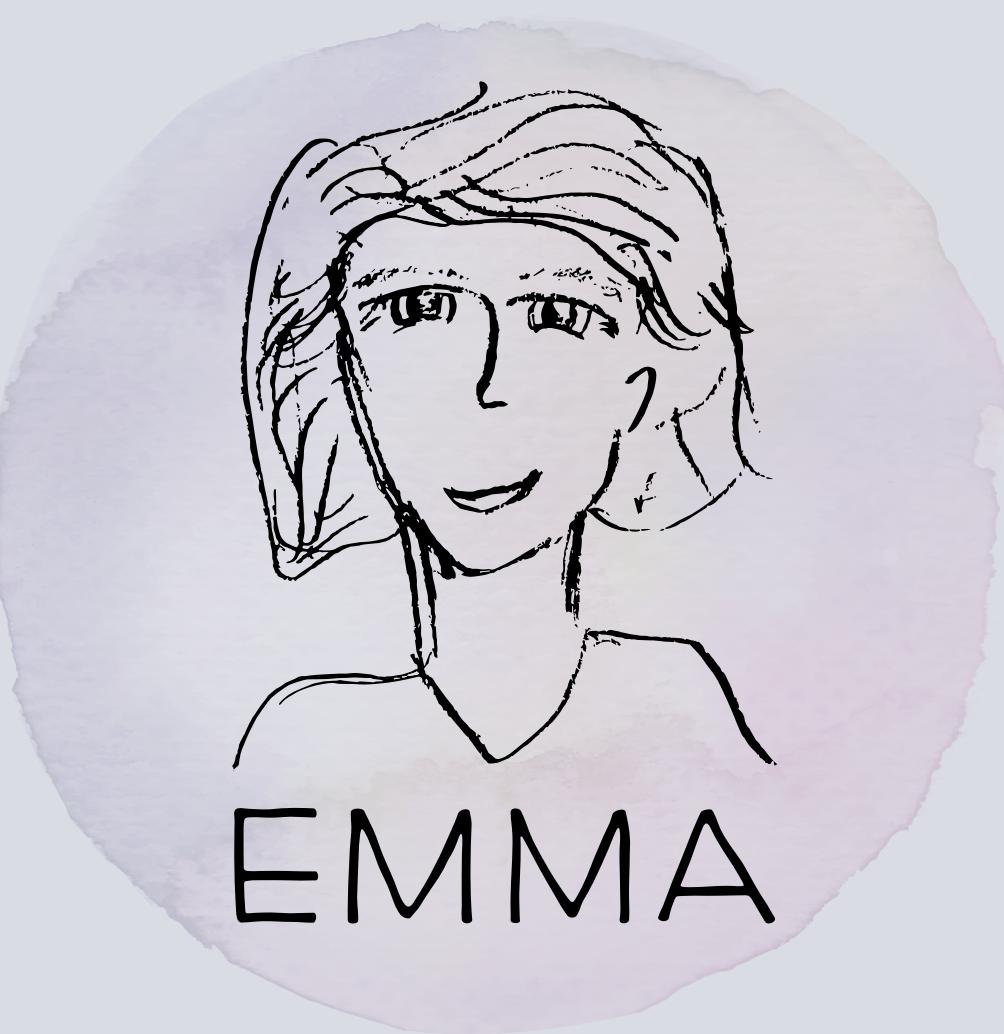
# Personas



JOEY

**"I wish it were easier to access Freshkills Park near the Staten Island Mall."**

- Lives in Arden Heights, Staten Island
- Enjoys biking and other outdoor activities
- Mildly prefers quiet in the park
- Interested in education
- Strongly prefers athletic experiences in the park over relaxing experiences



EMMA

**"It was a big challenge for me to get to Freshkills Park from Manhattan."**

- Lives on the Upper West Side in Manhattan
- Learned about Discovery Day at Freshkills Park in Time Out New York.
- Preferred a more structured experience during Discovery Day
- Noted the amount of brown grass at Freshkills Park
- Wanted to be professional landscape architect



TANYA

**"I'm very interested in environmentalism, education, and social justice."**

- Lives in Annadale, Staten Island
- Strongly prefers natural sights to artificial environments
- Prefers tastes evoking farms rather than food trucks
- Strongly prefers floral scents to open lawns
- Wants a variety of activities available in the park in regards to athletics, relaxation, and sounds

A photograph of a coastal landscape. In the foreground, two people are sitting on large bales of hay, facing away from the camera towards a body of water. The water is calm, reflecting the overcast sky. Beyond the water, there is a dense forest of green trees. In the far distance, the silhouette of a major city skyline is visible against a hazy, grey sky. The overall atmosphere is peaceful and contemplative.

PRECEDENTS

# Black Holes Merging

## LOCATION

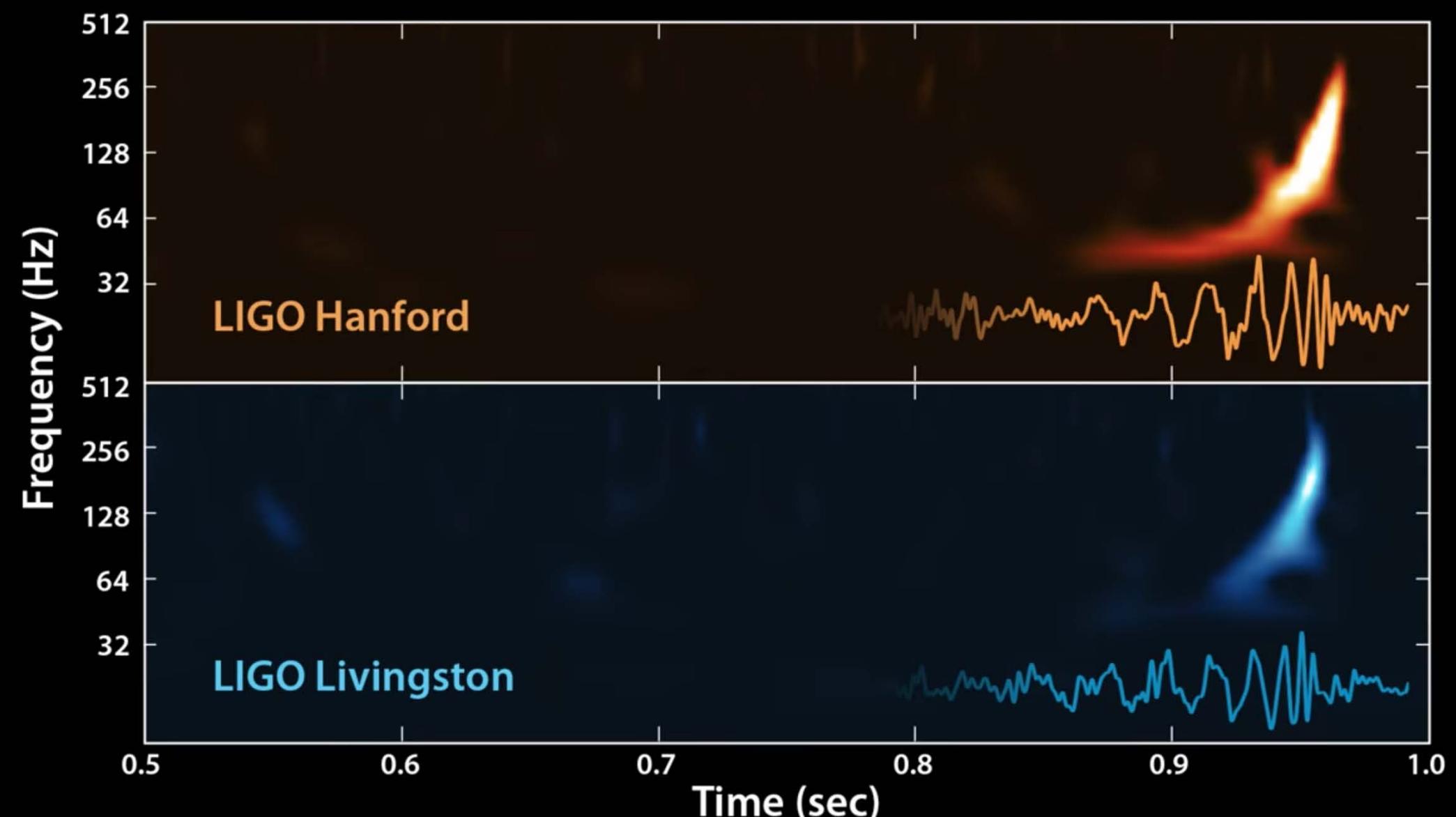
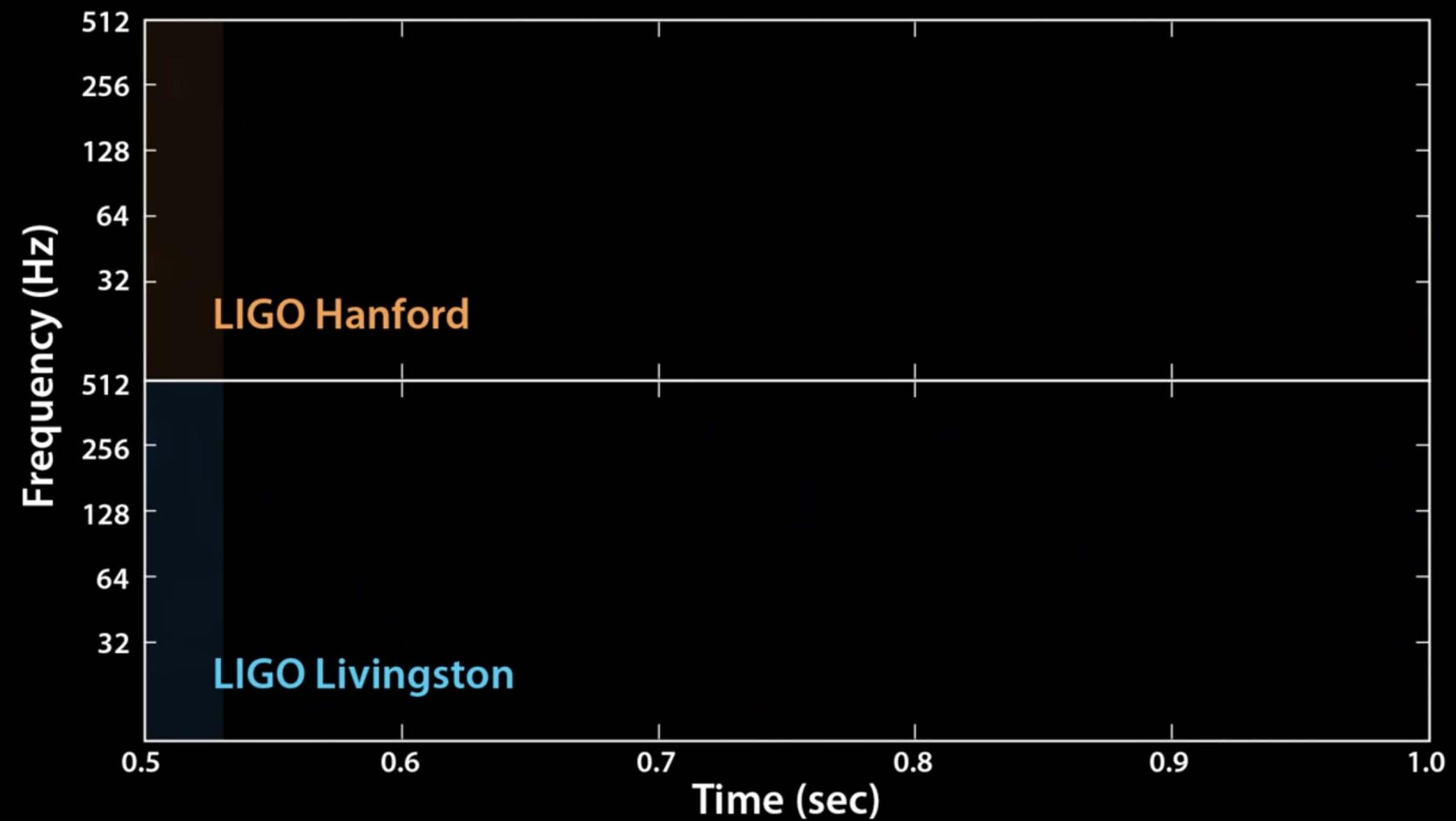
Cambridge, Boston, USA

## DESCRIPTION

A data sonification and visualization of the gravitational waves emitted by the collision of two black holes

## BEST PRACTICES

- Makes highly technical information accessible to a general audience
- Aesthetically pleasing interpretation of data
- Straightforward and honest in the presentation of scientific information



# Subway Symphony

## LOCATION

New York, New York, USA

## DESCRIPTION

Replaces the abrasive ‘beep’ played when one swipes their Metrocard with a preprogrammed musical tone as part of a harmonic sequence

## BEST PRACTICES

- Augments a familiar artifact with an unexpected auditory experience
- Does not require participants to “opt-in” while not being intrusive



# Foresta Lumina

## LOCATION

Coaticook, Quebec, Canada

## DESCRIPTION

A nocturnal park experience which utilizes lighting, projections, video mapping, and an original soundtrack

## BEST PRACTICES

- Creates an immersive experience with minimal interference with the natural environment
- Engages visitors by stimulating a variety of senses
- Activates the park during a time at which it would otherwise be dormant to visitors



# Music & Plant Growth

Some studies have shown that the vibrations of sound can have a positive effect on plants, influencing growth, germination, and yield amounts.

## EXPERIMENTS

- T.C. Singh, the head of the department of botany at Annamalai University, found sound waves stimulated rice harvests 25-60% higher than average, and nearly 50% higher for peanuts and tobacco.
- George Smith, an agricultural researcher, planted corn and soybeans for a controlled experiment in greenhouses. He played George Gershwin's "Rhapsody in Blue" 24 hours a day, producing thicker, greener plants that weighed 40% more for corn and 24% more for soy.



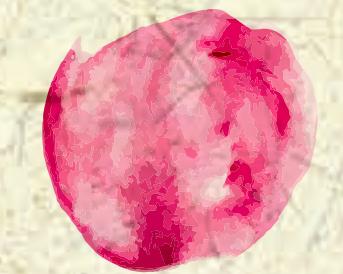
# DESIGN PRINCIPLES



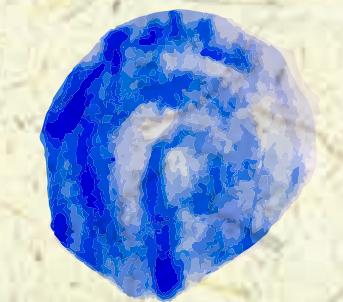
Make Freshkills a **destination**.



Be **accessible** inside and outside of the park.



Spark **conversation**.



**Connect** visitors to nature using technology.

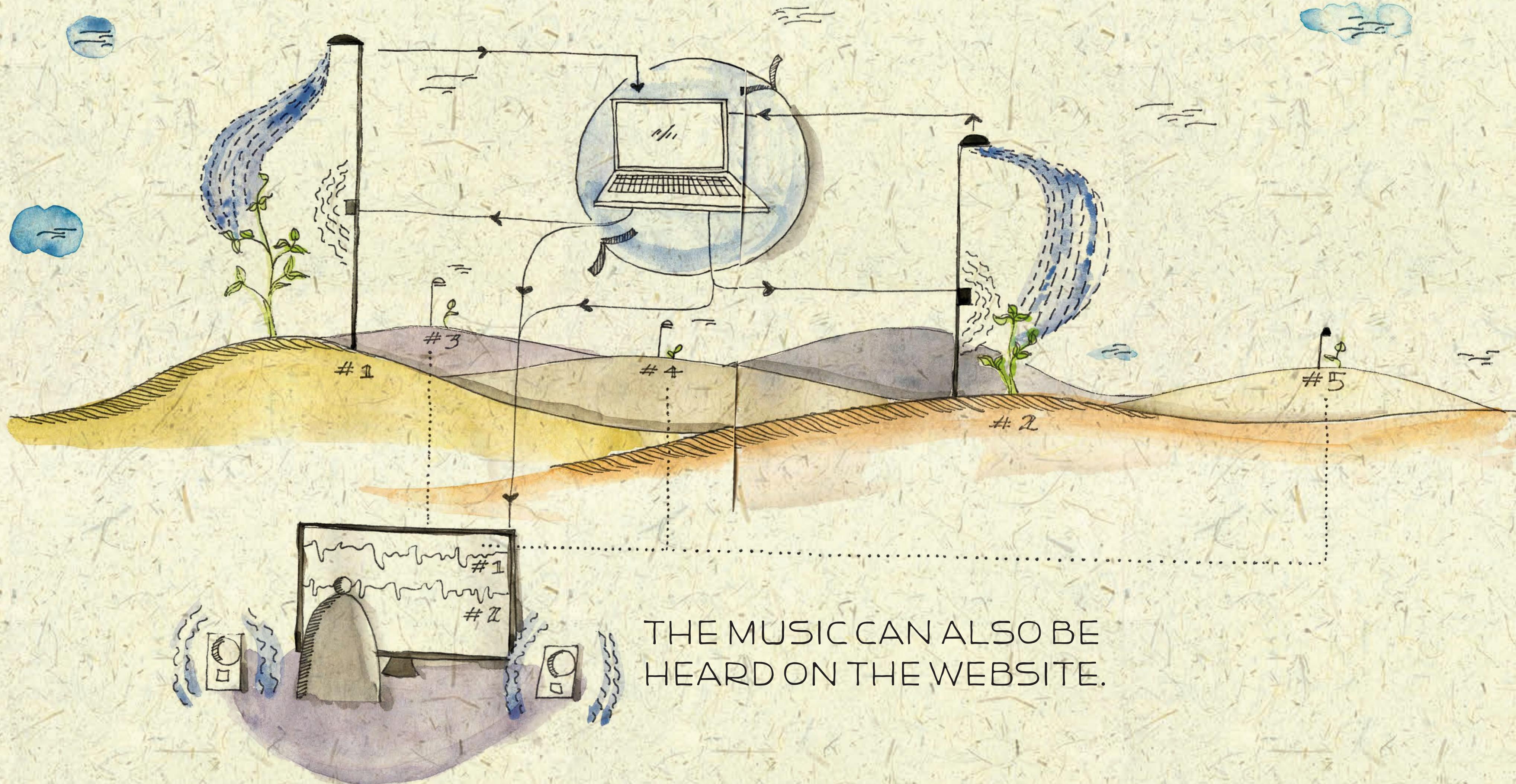


Create an unconventional **sensorial** experience.



# SYSTEM OVERVIEW

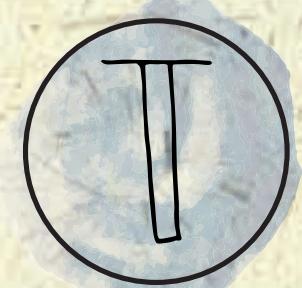
MUSIC IS GENERATED BY THE BOTANICAL TRANSMISSIONS COMPOSER BASED ON PULSEPOD DATA AND PLAYED FROM SPEAKERS THROUGHOUT FRESHKILLS PARK.



# COMPOSITION PROCESS

THE CONTOUR FROM EACH DATA STREAM IS CONVERTED INTO A MELODY BASED ON FIVE TRAITS. THEY ARE THEN MIXED TOGETHER TO CREATE A SINGLE AUDIO FILE.

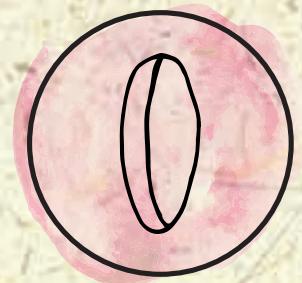
## THE FIVE TRAITS OF A BOTANICAL COMPOSITION

**Tonic**

The first note from which the scale is built

**Scale**

The series of notes used in the composition

**Octaves**

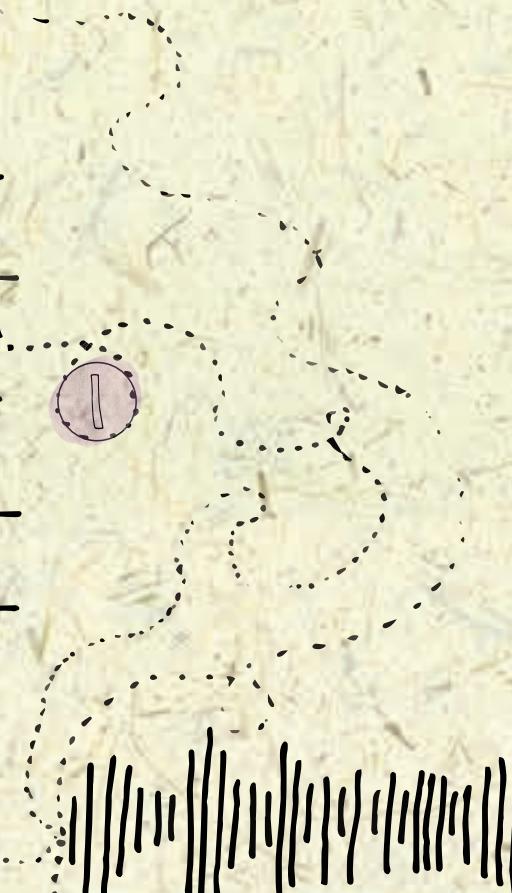
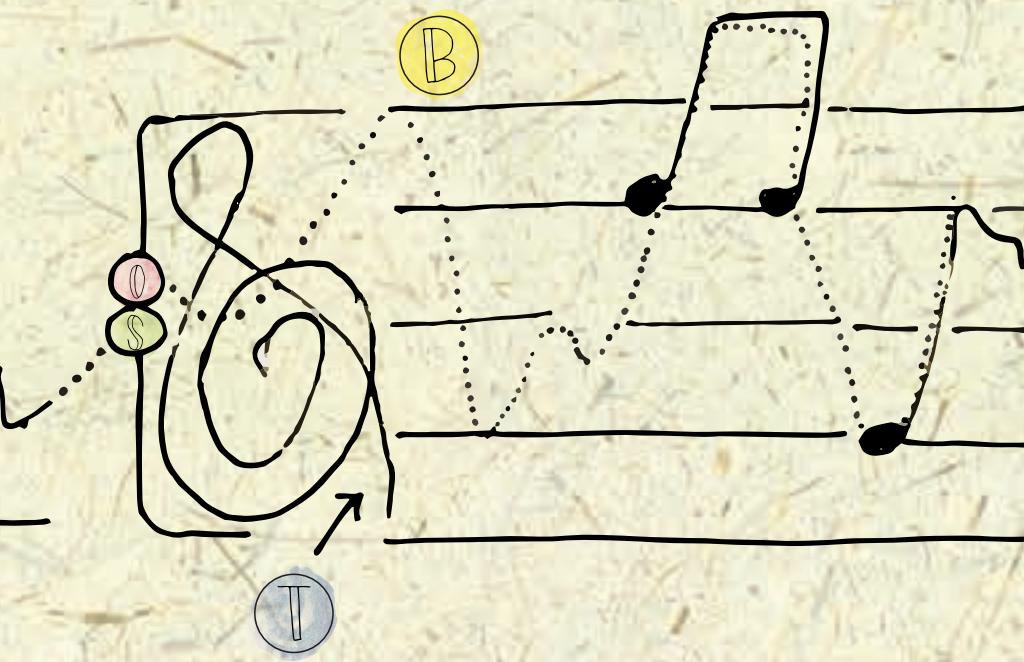
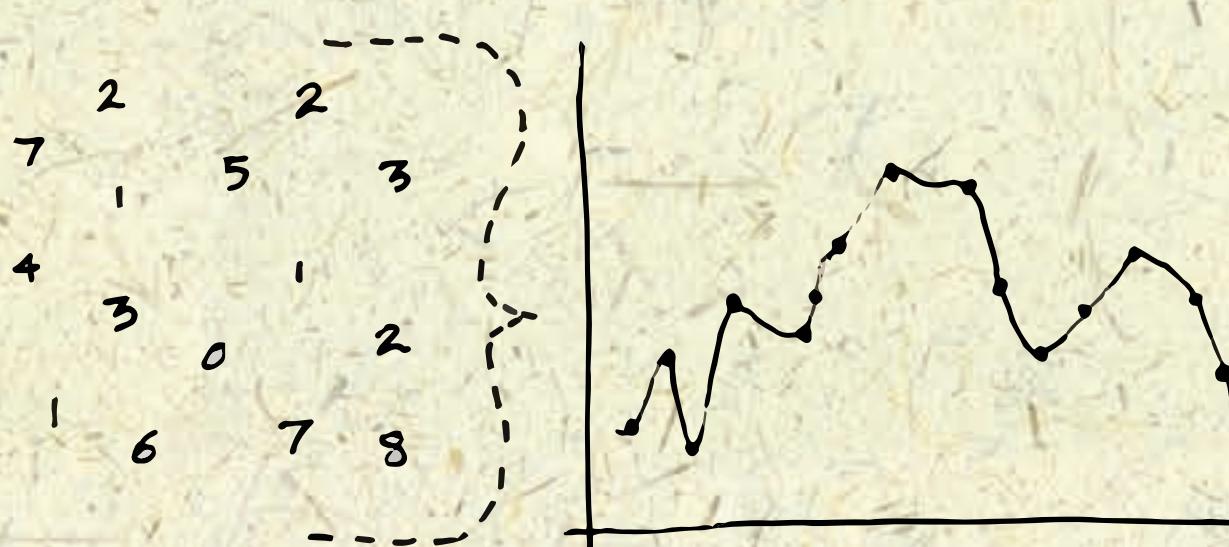
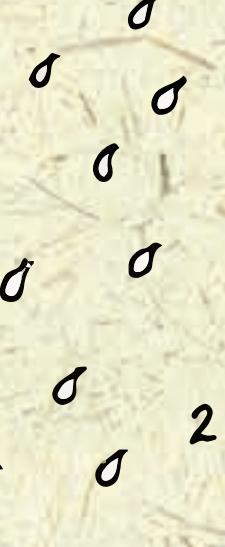
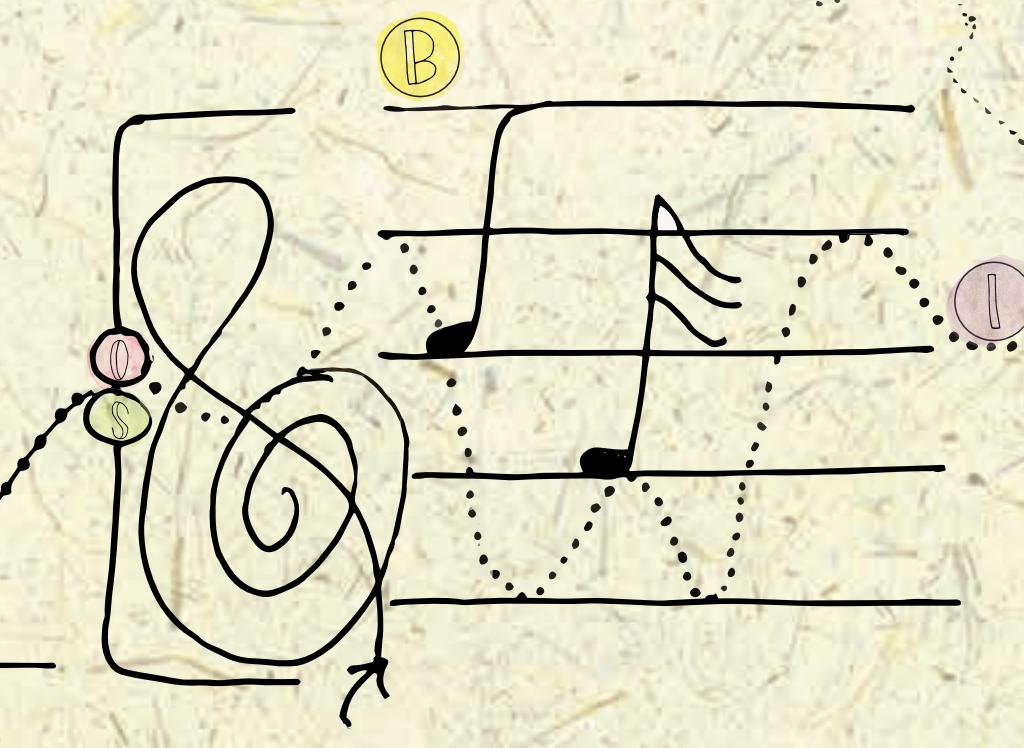
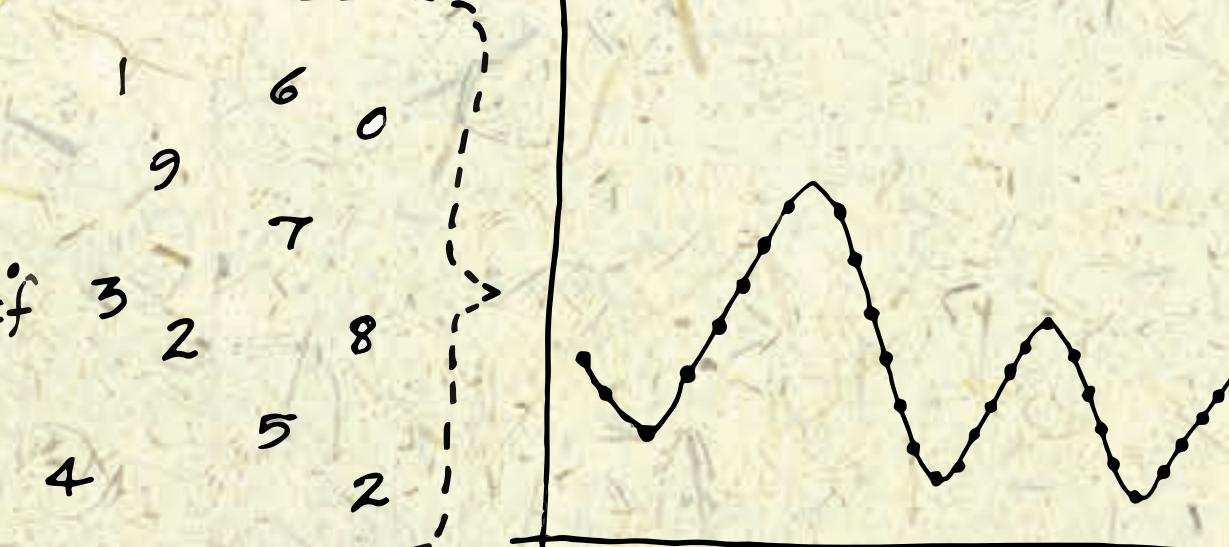
The number of times the scale can repeat

**BPM**

The tempo of the song, measured in beats per minute

**Instrumentation**

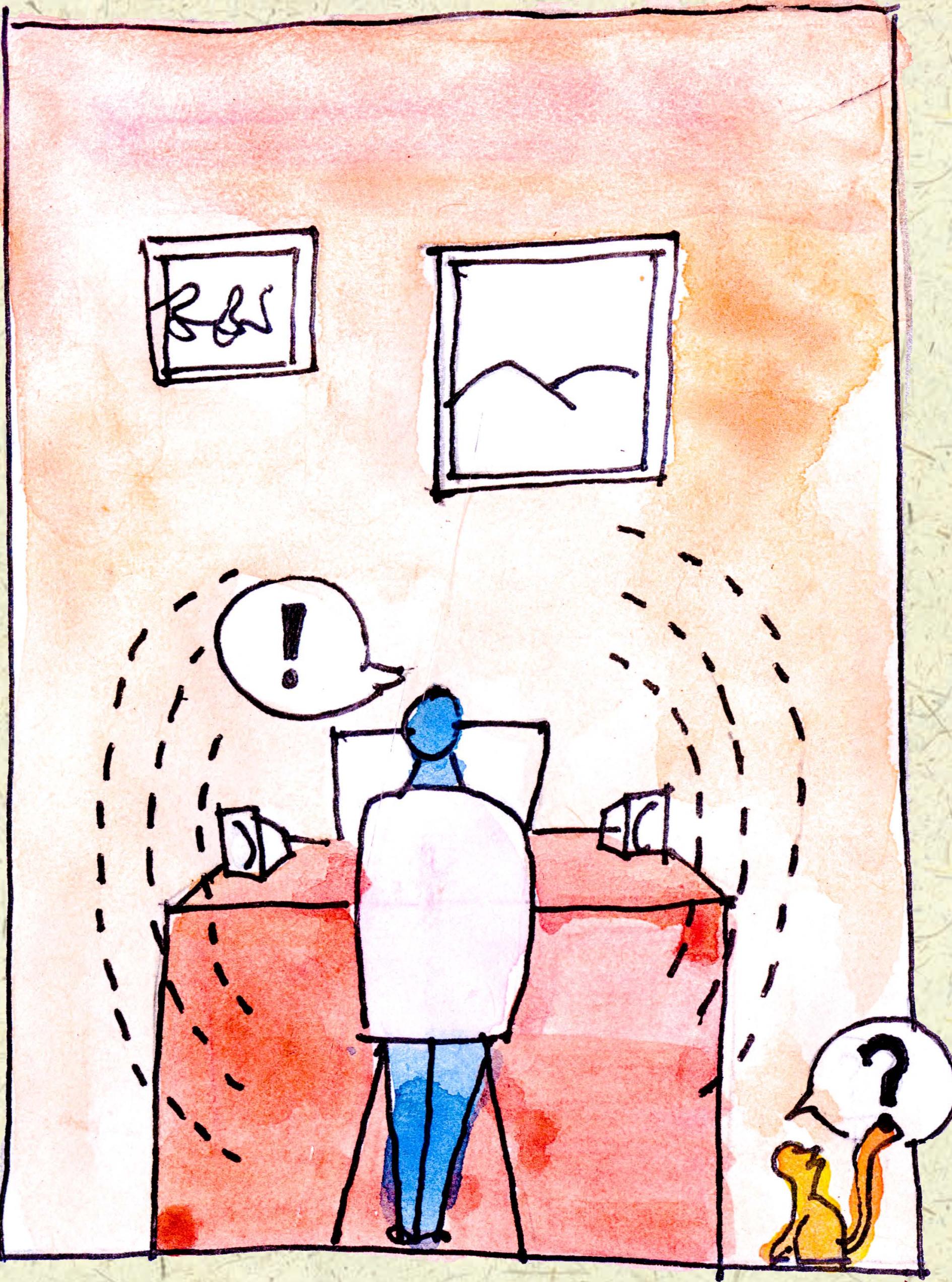
The virtual instruments used to render the composition into audio

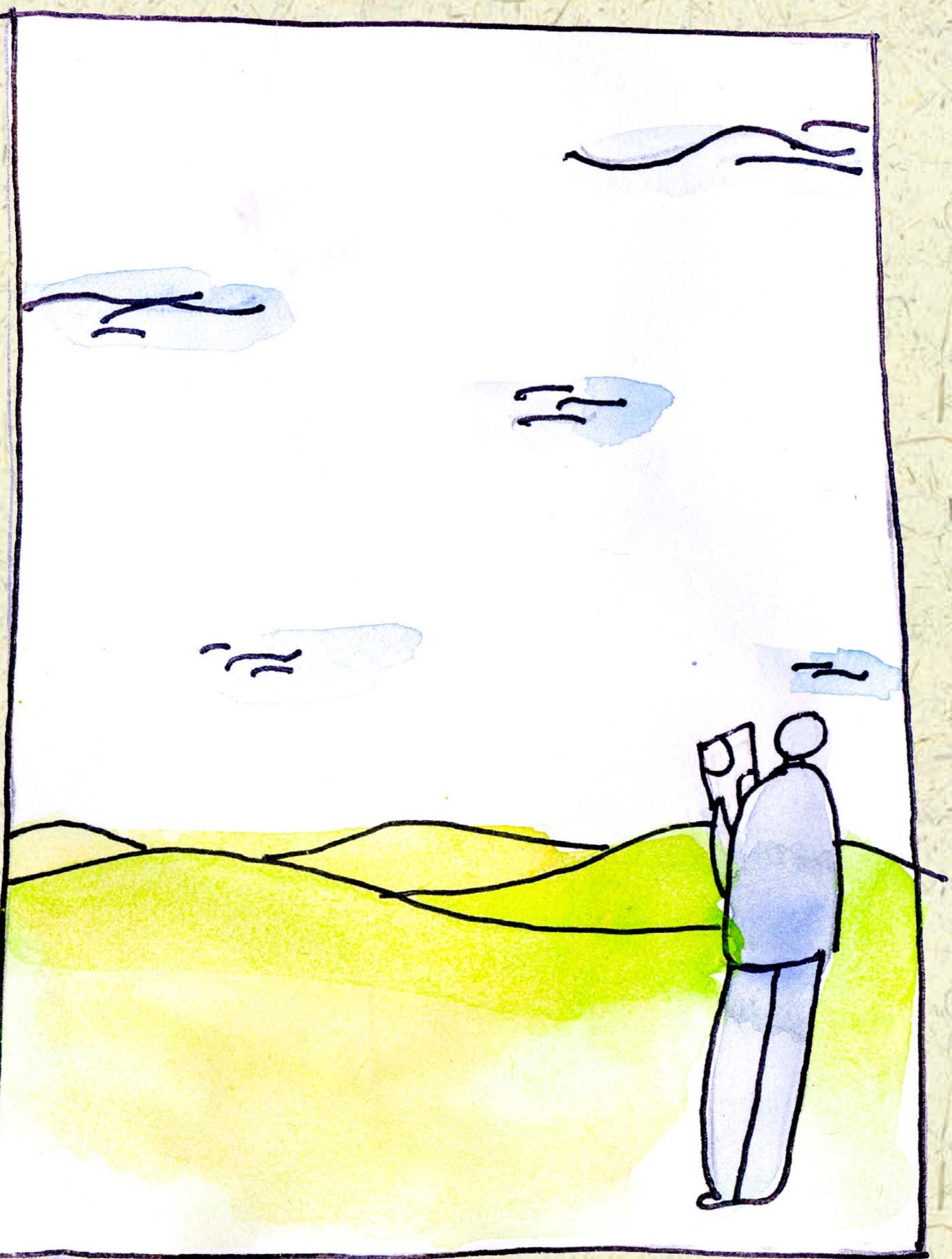
**RAINDROP COUNT****AIR TEMPERATURE**

The Botanical Transmissions Composer

RESET

ADD INSTALLATION »		Installation 1		Installation 2		Installation 3		Installation 4		Installation 5		
		RELATIVE PLANT HEALTH		RELATIVE PLANT HEALTH		RELATIVE PLANT HEALTH		RELATIVE PLANT HEALTH		RELATIVE PLANT HEALTH		
Generation 17	<b>PLAY</b>	in Db locrian pentatonic over 4 octaves played at 167 bpm by pianos and strings		<b>PLAY</b>	in F lydian #5P pentatonic over 3 octaves played at 241 bpm by strings		<b>PLAY</b>	in Db bebop minor over 6 octaves played at 142 bpm by pianos and strings		<b>PLAY</b>	in Gb ionian pentatonic over 5 octaves played at 184 bpm by an orchestra	
Generation 16	<b>PLAY</b>	in D locrian pentatonic over 4 octaves played at 169 bpm by pianos and strings		<b>PLAY</b>	in A spanish over 6 octaves played at 243 bpm by strings		<b>PLAY</b>	in Gb flamenco over 4 octaves played at 198 bpm by an orchestra		<b>PLAY</b>	in D minor bebop over 5 octaves played at 116 bpm by pianos and strings	
Generation 15	<b>PLAY</b>	in D purvi raga over 4 octaves played at 167 bpm by pianos and strings		<b>PLAY</b>	in A lydian dominant over 4 octaves played at 66 bpm by a piano		<b>PLAY</b>	in Gb flamenco over 4 octaves played at 210 bpm by strings		<b>PLAY</b>	in D minor bebop over 5 octaves played at 112 bpm by pianos and strings	
Generation 14	<b>PLAY</b>	in D purvi raga over 4 octaves played at 169 bpm by pianos and strings		<b>PLAY</b>	in B prometheus over 2 octaves played at 78 bpm by strings		<b>PLAY</b>	in Gb in-sen over 4 octaves played at 141 bpm by an orchestra		<b>PLAY</b>	in D minor bebop over 5 octaves played at 109 bpm by pianos and strings	
<b>GENERATE MUSIC</b>												







# CONSIDERATIONS

- Number of Installations
- Digital Infrastructure
- Physical Infrastructure  
(including security and power)
- Budget
- Noise (regarding neighbors and wildlife)

# NEXT STEPS

- Identify specific sites for installations
- Seek approval from city agencies and community

THE END

