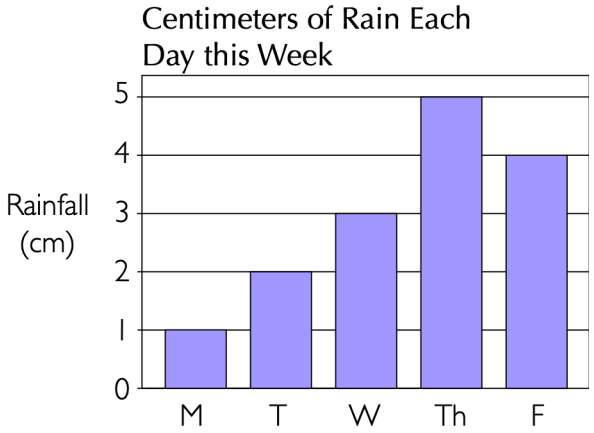
## Chapter 14: Sound and touch

In the following exercises you'll try making your own data sonification and data physicalization. You'll then let someone else hear or feel what you've made and ask them a few questions about what they notice.

Note: If you aren't able to make the sonification or physicalization with the suggested materials, feel free to get creative and make them with something else. You can also answer the questions for yourself if it's not a good time to ask someone else to participate. If you are deaf or hard of hearing you are welcome to make two physicalizations or remake the visualization in a different way.

1. Make a sonification that replaces the lengths in the following bar chart with high and low pitches.




   a. If you play an instrument, you can use the first, second, third, fourth, and fifth note of a scale. You can also use your own voice—some people call this *punk sonification*!

      If you don't play an instrument or feel comfortable singing, you can fill a few cups with different amounts of water so that they make different sounds when you lightly tap them with a spoon. The more water you add, the lower the pitch will be. Sort the cups in order so that you can to create a data sonification of the bar chart.

      Play the sonification for yourself. Write a few sentences about how you made your sonification and what you hear.


© 2024 Nancy Organ

b. Find a friend or family member to listen to your data sonification. Don't show them the visualization! Tell them what the sonification is about, something like, "This sonification is about the amount of rainfall in centimeters each day this week. The first note is on Monday, and the last note is on Friday."

   Play your sonification and have them guess which days had the most and least rain. Record their answer and why they thought that.

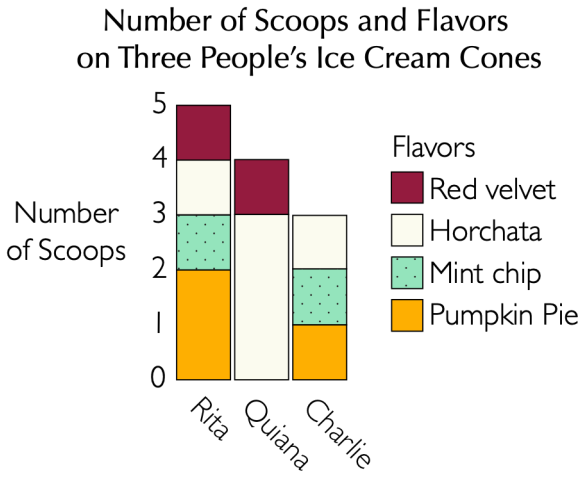
c. Now, tell them the highest and lowest values and what it means to go up or down in pitch. Something like, "Now, I'll tell you that the driest day had one centimeter and the rainiest day had five centimeters of rain. Higher numbers have higher sounds."

   Play your sonification again, and have them guess the value for each day. Write down their guesses. Were they right?

d. Show them the visualization that you turned into a sonification. Record how they react to seeing the visualization.


© 2024 Nancy Organ

2. Make a physicalization that replaces the categorical colors in the following visualization with different textures of paper.




   a. Find four different types of paper or material that you can cut up. You might use printer paper, construction paper, aluminum foil, pieces of plastic bag, cloth, duct tape, or something else you find around the house. Write down which material will replace each color.

      Cut the materials into small pieces that are about an inch wide. Make as many squares as there are scoops of ice cream in the visualization. For example, Rita had two scoops of pumpkin pie ice cream and Charlie had one, so you'll need to make three squares of material to represent pumpkin pie ice cream.

   b. Organize your pieces of materials into little piles so that each pile shows the types of ice cream that each person had.

      Close your eyes and feel each pile. Can you get a good idea of who had what, and who had the most?

   c. Find a friend or family member to try out your data physicalization—but don't show them the visualization or physicalization before you begin! You may need to cover your physicalization with a towel or box so that it stays hidden.

      Tell the other person what the physicalization is about. You might say


© 2024 Nancy Organ

something like, "This is a data physicalization about the different kinds of ice cream scoops that three people had." Explain what each material means.

Have them close their eyes and feel each pile of material. Write down what they experience and if they are able to say how many scoops of each ice cream flavor there are in each pile.

d. Now, show them the visualization that you turned into a physicalization. Record how they react to seeing the visualization.


© 2024 Nancy Organ