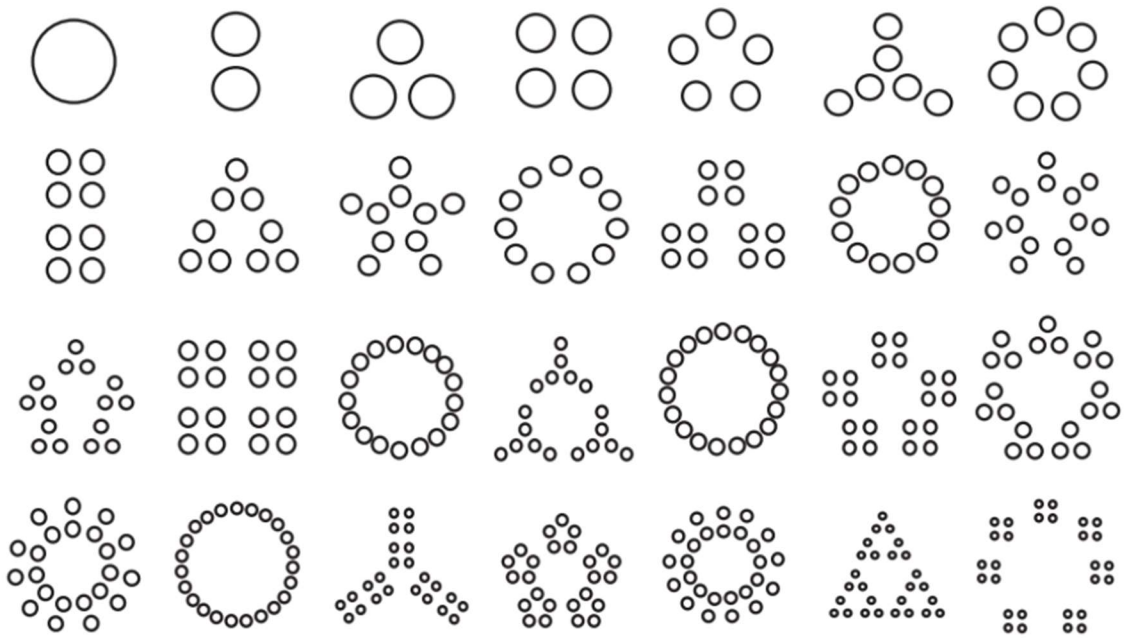
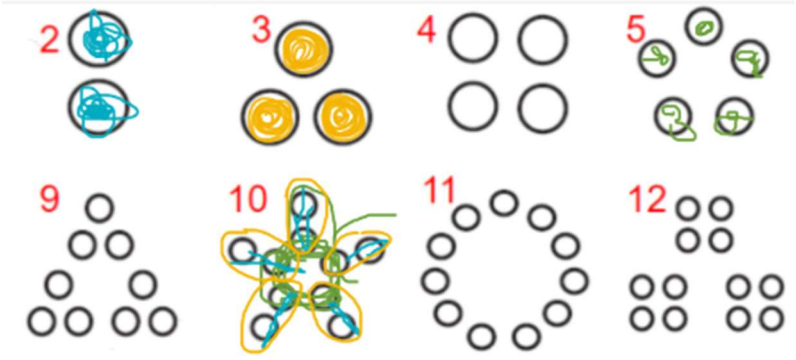
The session opened with a wonder and notice of this image:



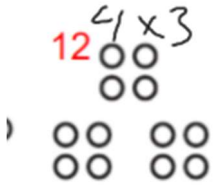
Participants noticed that the number of dots in each figure is increasing by one as you look left to right in each row. One person said they see certain groupings of dots repeated in other groupings. Another noticed that the dots are arranged in a circle for some numbers and someone else wondered if that was because those numbers are prime.

We had two breakout groups in which participants discussed how the dots were arranged and made predictions about how larger numbers might be arranged.



Both groups discussed how the arrangement for 10 is created using the arrangements for both 2 and 5. One group described it as starting with the arrangement for 5 and replacing each dot in the 5 with the pattern for 2 and discussed that this is related to 5x2.

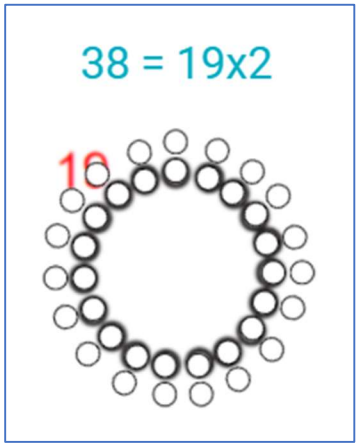
Similarly, 12=4x3 and is created by replacing each dot in the “3” arrangement” with the 4 dot

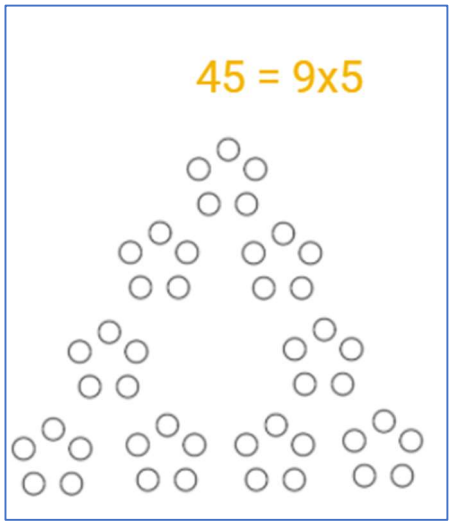


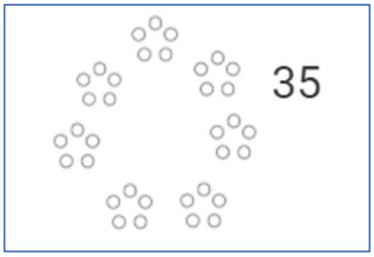
arrangement:

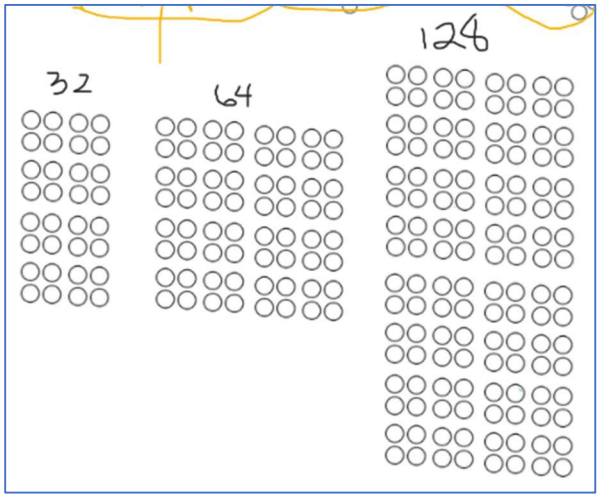
One group conjectured: “The shapes are built out of their factors. The smaller factor determines the shape of the vertices (what replaces the circles in the other shapes) and the larger factor determines the array.”

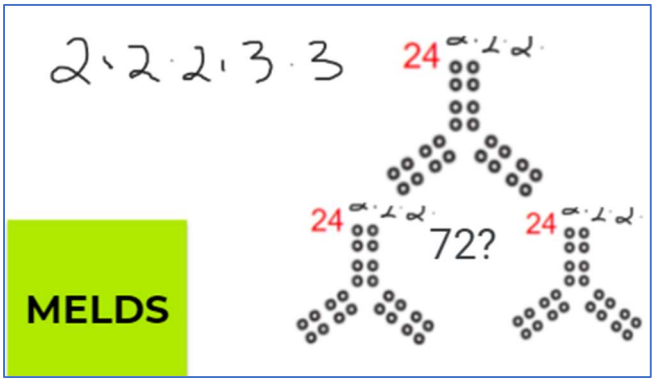
Groups explored ways to display larger numbers, with much discussion about the role each factor has in the arrangement. Below are some images from that work:











During the wrap-up discussion, we compared our work to the arrangements created by the artist shown here. http://www.datapointed.net/visualizations/math/factorization/animated-diagrams/

Resources:

Notice & Wonder Slides: https://docs.google.com/presentation/d/1_DYqQlozcIltL-oMBdV88v8BiFQUWPCXM2ObaJfQu9s/edit?usp=sharing

Jamboard with our explorations: https://jamboard.google.com/d/1r0qbG7o59UDwnjie7holiiYcJrmKvOJ9BHYLfsNP34w/edit?usp=sharing

YouCubed Lesson Plan (source for our activity): https://www.youcubed.org/wim/number-visuals-6-12/

Brent Yorgey Blog about the original dot designs: https://mathlesstraveled.com/2012/10/05/factorization-diagrams/

Dancing Dots (animated adaption of Yorgey's work): http://www.datapointed.net/visualizations/math/factorization/animated-diagrams/

Blog by the artist: http://www.datapointed.net/2012/10/animated-factorization-diagrams/