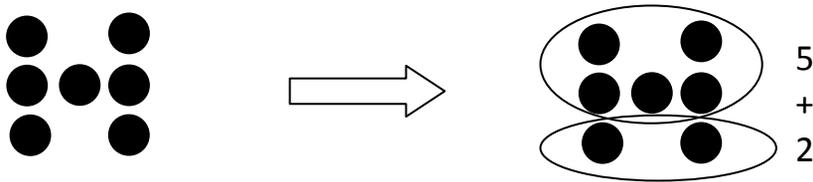


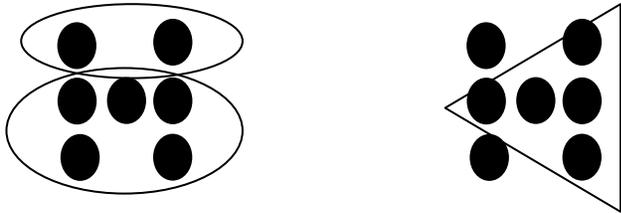
Dot Pattern/Ten Frame/MathRack Cards

This set of cards includes the dot pattern representations for the numbers 1-10, the ten frame representations for the numbers 0-10, and the [MathRack](#) representations for the numbers 1-20. All of these help build a spatial relationship of numerals for children. For many children the only picture they have of seven is the numeral. That “picture” makes it almost impossible for them to see how that can be broken into a 5 and a 2, or a 6 and a 1.

However if a child sees this for seven, they can actually see a 5 and a 2:

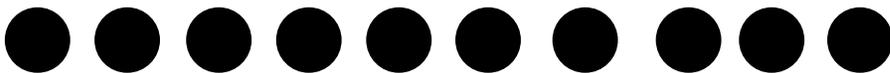


Using that same pattern, some children may see the 5 and 2 differently:

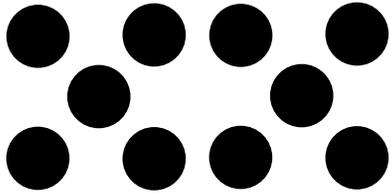


And even cooler is that they do not have to see it as only 5 and 2. Some may see 6 and 1 or 4 and 3 (Can you see them?). The point is to give them a visual representation of the abstract symbols we ask them to compute with. Many children are still grappling with making sense of single digits; that 7 can be $7+0$, $6+1$, $5+2$, $3+4$, and so on. However at the same time they are dealing with this understanding we are asking them to think about combining those same numbers but with place value: 1 and 6 now become 16. When we give them a visual picture of $1 + 6$ they can see for themselves that it makes 7 and not just because we put a '+' sign in between them.

Building spatial relationships also builds the idea of subitizing. Subitizing is being able to instantly recognize how many are in a set (Clements, 1999). For most people we can only subitize small sets (less than 5) unless they are in some kind of familiar pattern. For larger sets of numbers we tend to decompose the set into smaller sets that we do instantly recognize. Which is why the Ten Frame is made up of two rows of five and the beads on a [MathRack](#) change color every five beads. Look at the dots below and determine how many total dots there are:



Did you do it without having to count every single dot to make sure of your total? Now try this one:



With this pattern you can instantly recognize the familiar pattern of five and there are two of them, so there has to be ten. There are lots of activities you can do with these cards, and they do not have to be used together either, but below is a brief list to get you started:

Make the Pattern: provide each student with about ten counters and a piece of construction paper as a mat. Hold up a dot pattern for about 3 seconds and have the children make the pattern they saw using the counters on the mat. *“How many dots did you see? How did you see them?”* Spend time discussing the configuration of the pattern and how children saw how many dots there were.

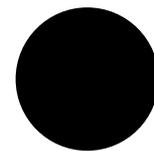
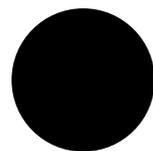
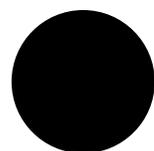
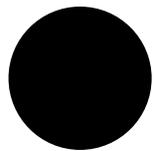
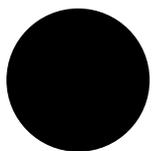
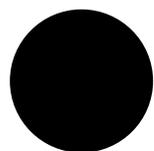
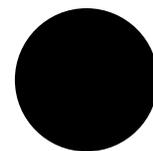
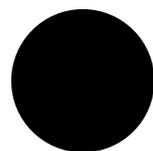
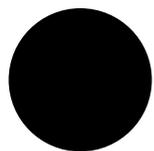
Overhead Pattern: print the templates on overhead transparency flash one pattern for about 3 seconds. Have a blank transparency over the dot pattern/ten frame/MathRack and ask students to come up and show how they figured out the number shown. Encourage them to circle the groupings they saw.

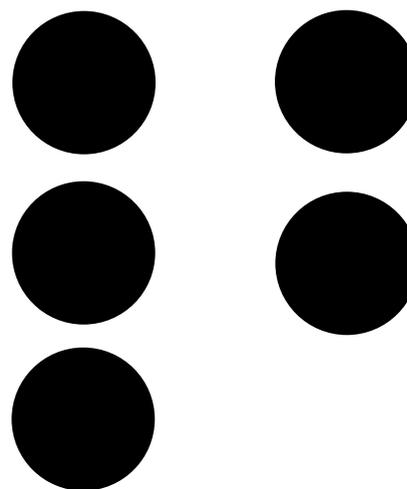
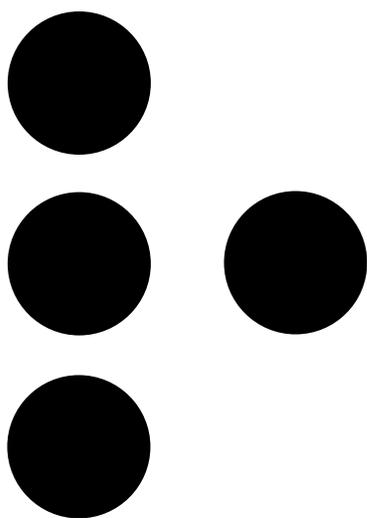
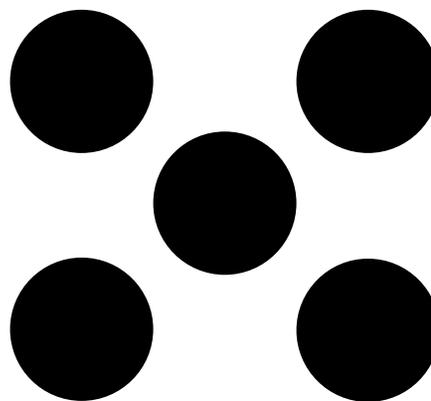
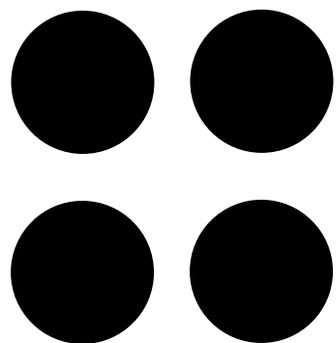
Which of these is not like the other? show three cards, all but one of which have the same number just in a different way. Children have to find the one card that does not belong.

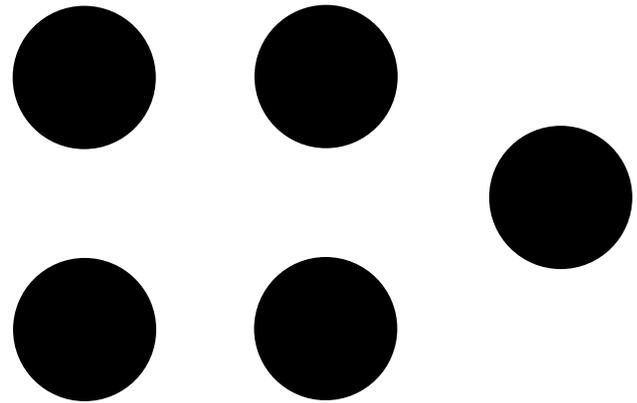
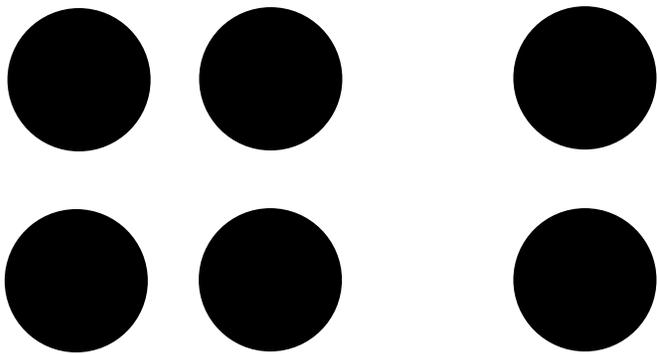
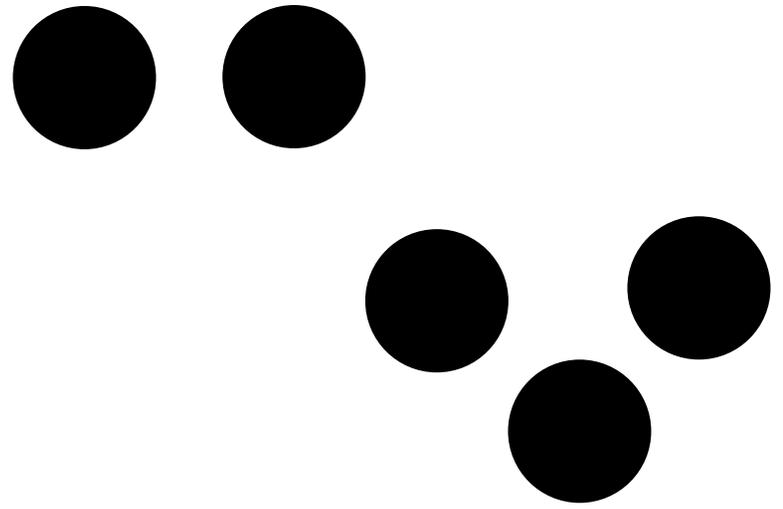
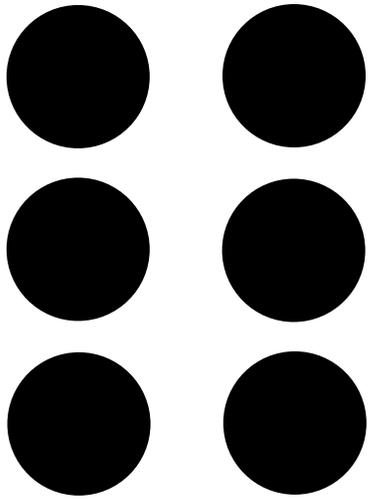
Flashcards: hold up a card for 1-3 seconds. *“How many were shown on that card? How did you see it?”* Include lots of easy patterns to build up their confidence. This can also be done with partners as a workstation activity.

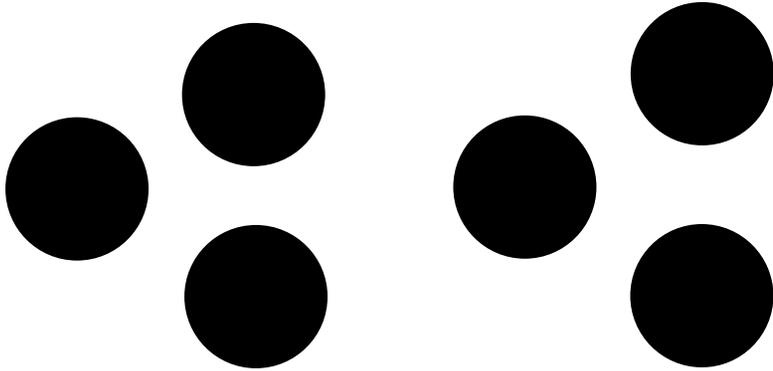
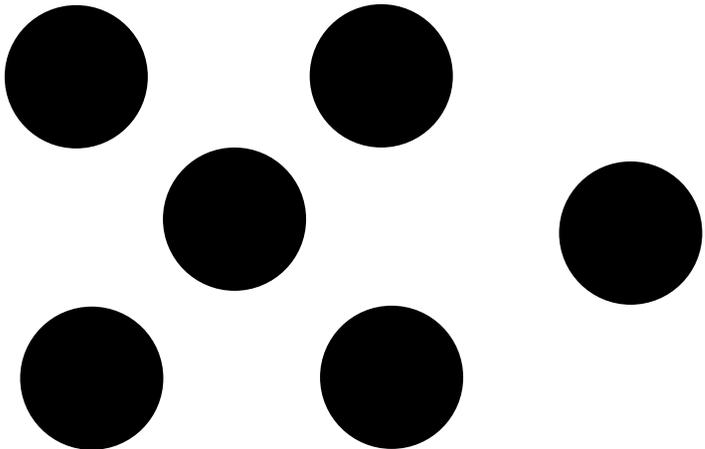
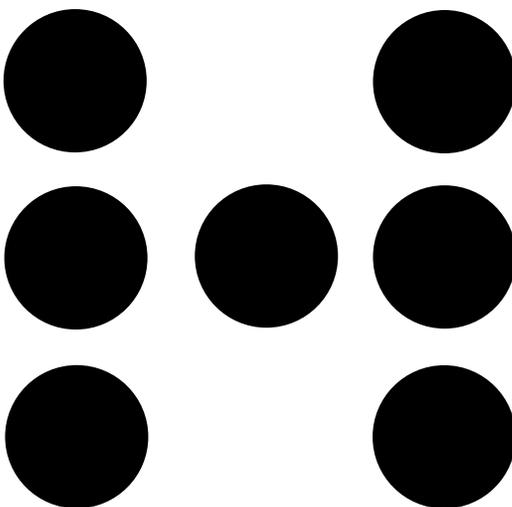
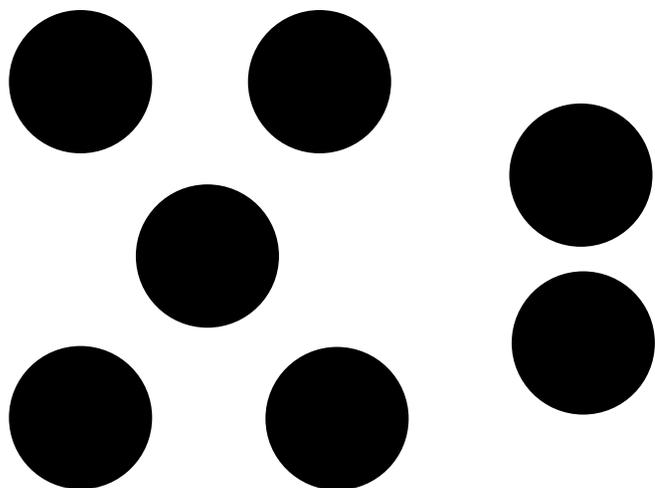
Fast Flash: have two students stand on opposite sides of an overhead projector. One student holds a pack of cards printed on transparency paper. The student places one of the cards on the projector and the other student takes it off as fast as she or he can. Then the members of the class, along with the teacher, race to announce the number that was shown.

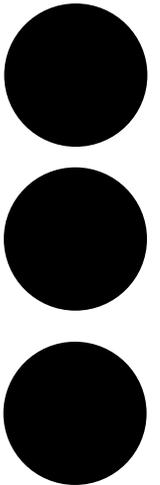
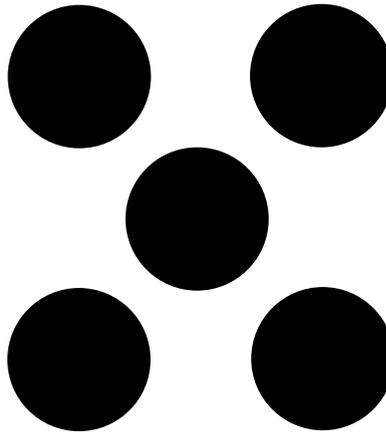
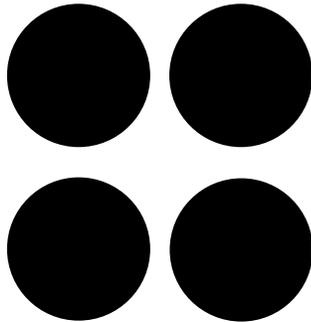
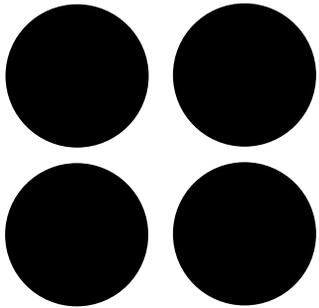
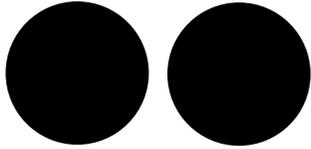
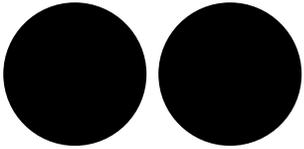
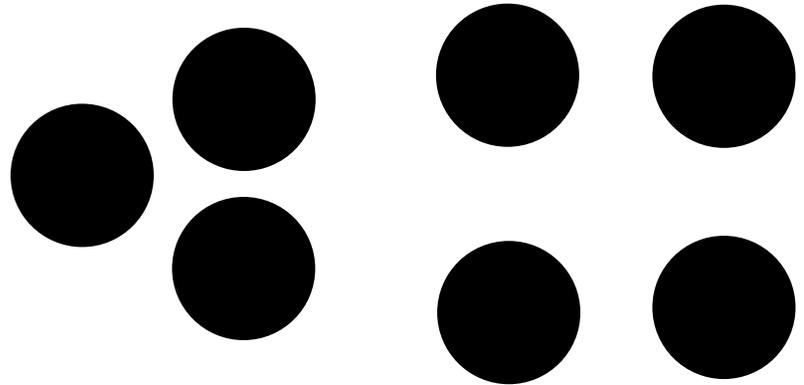
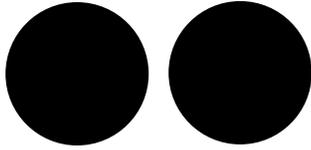
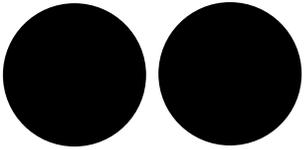
These cards are designed to be printed on cardstock. The design on the last page of the document is what I print on the back side of each page of cards so that when we play games like Memory with the cards, the kids cannot see through the card to tell what is shown.

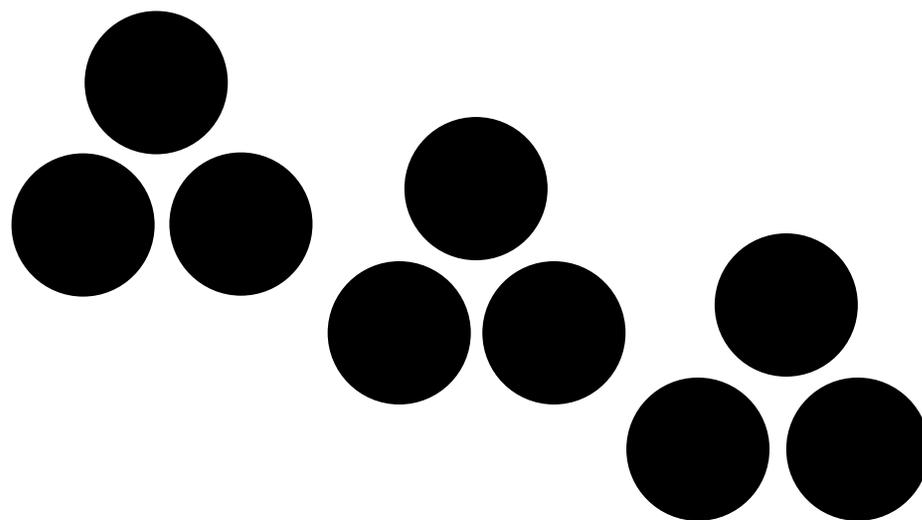
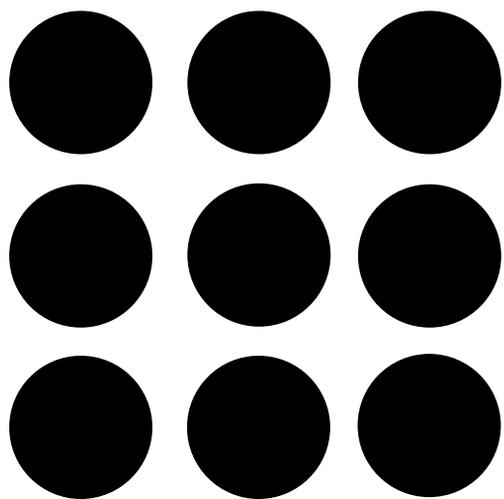
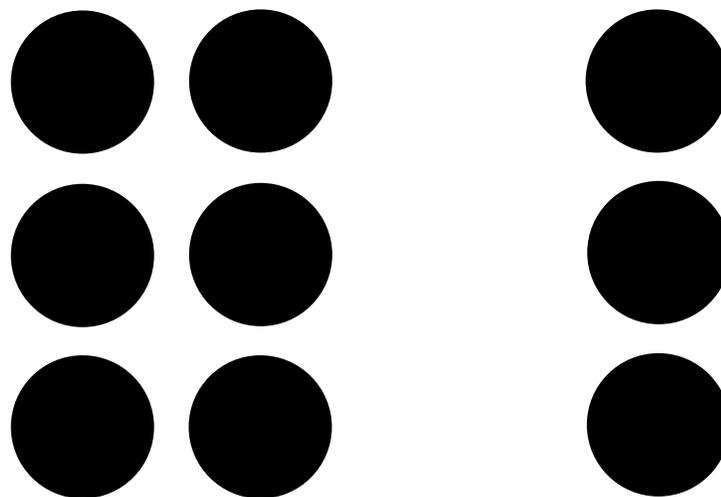
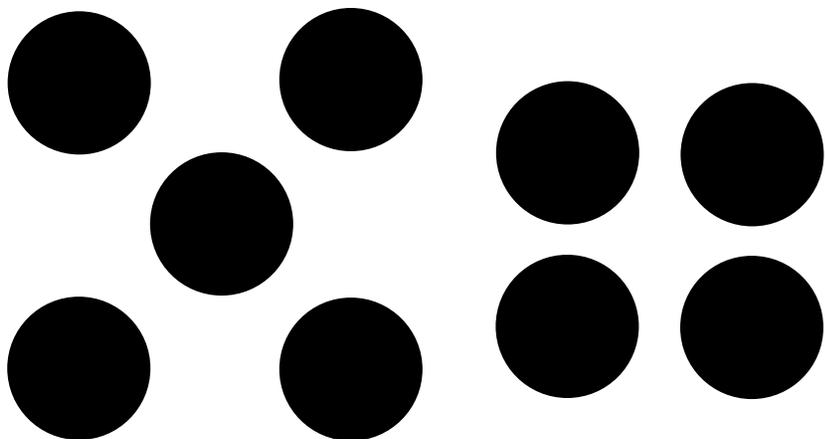


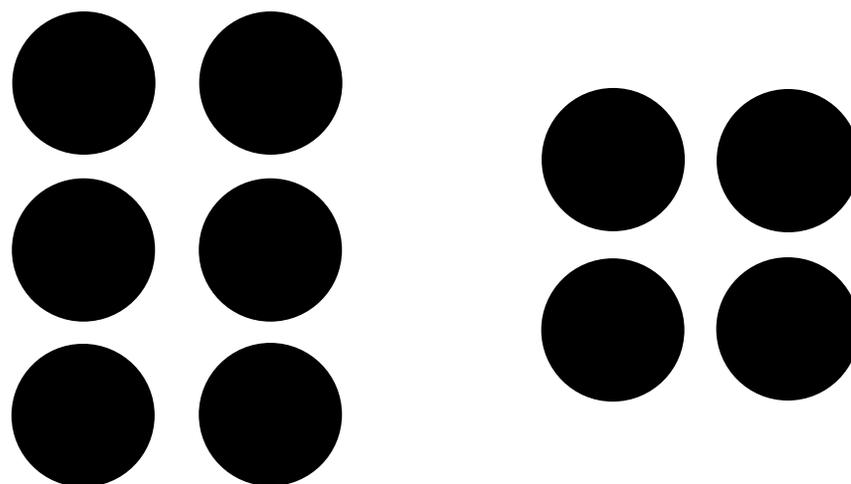
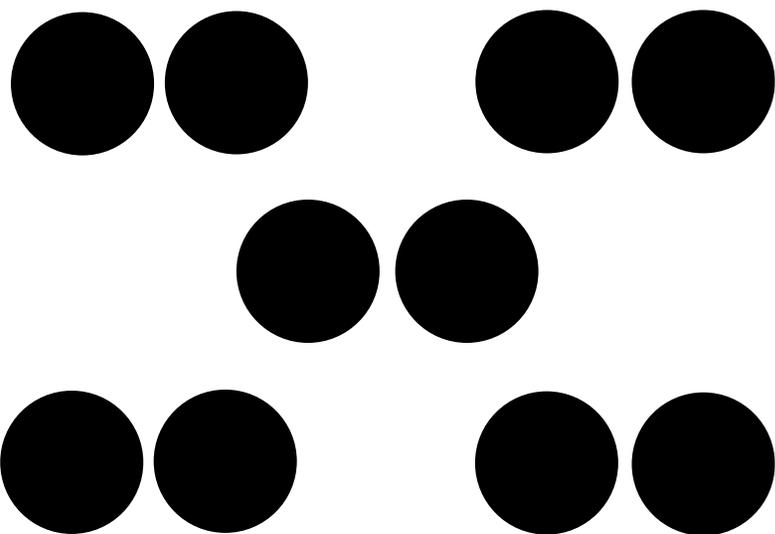
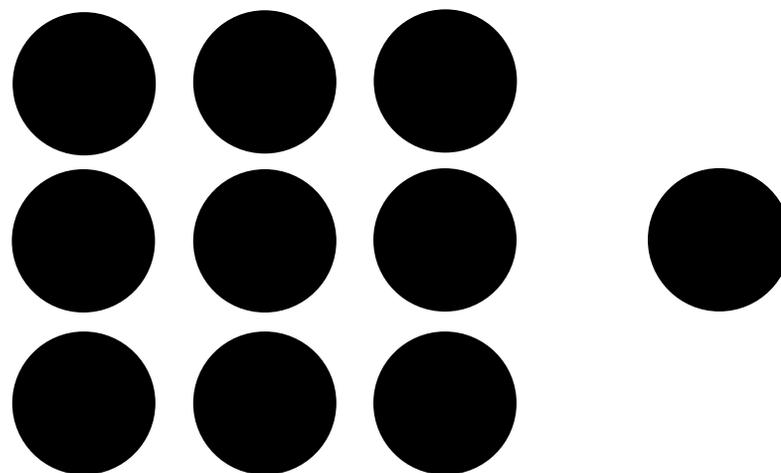
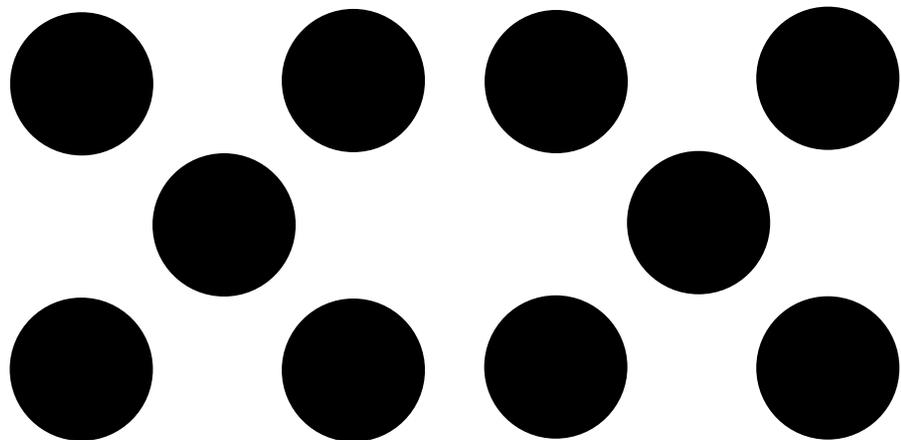


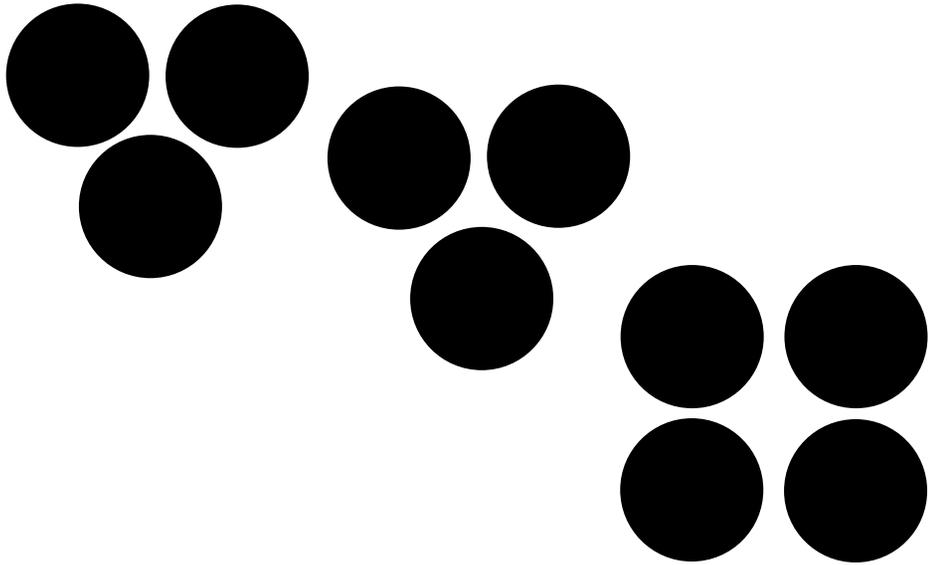






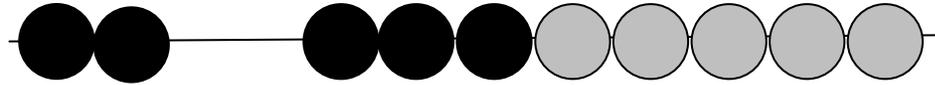
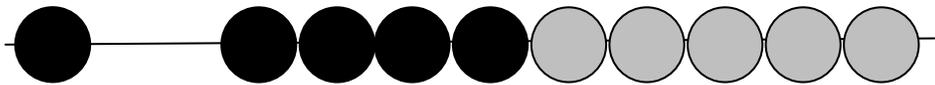


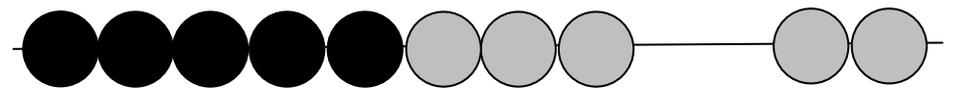
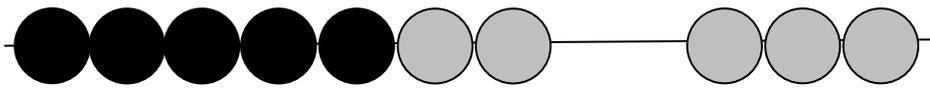
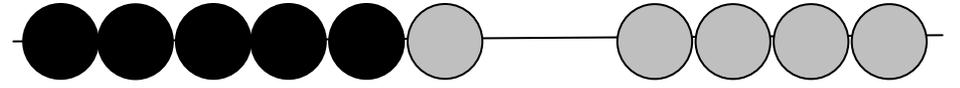


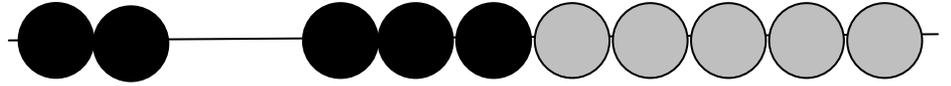
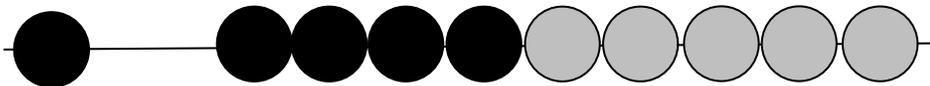
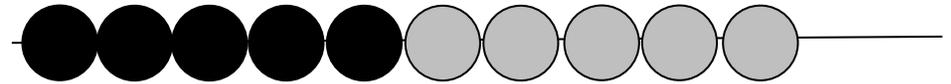
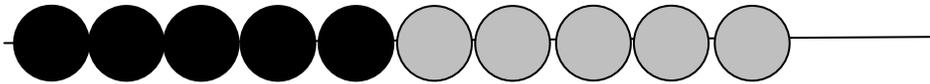
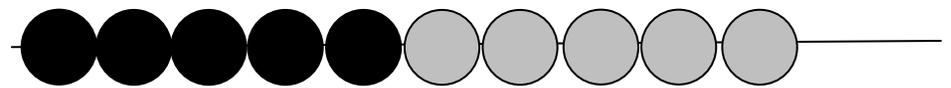
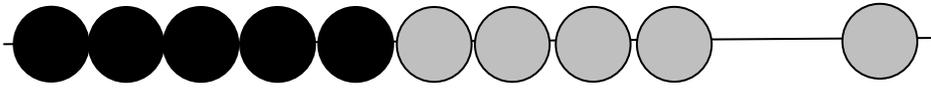


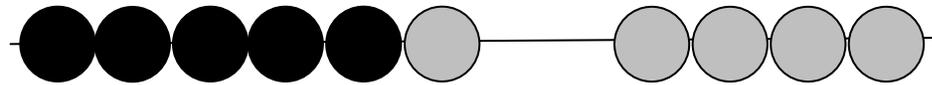
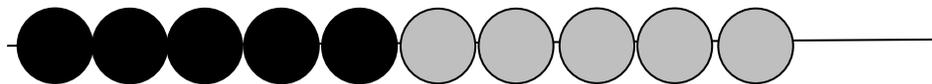
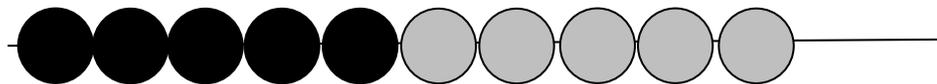
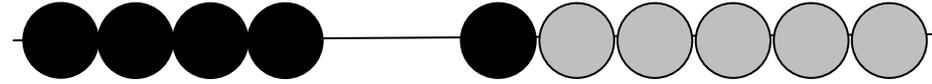
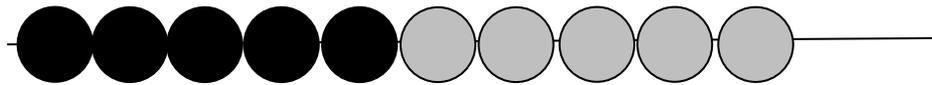
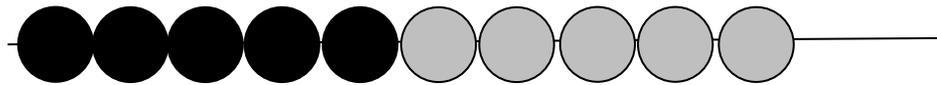
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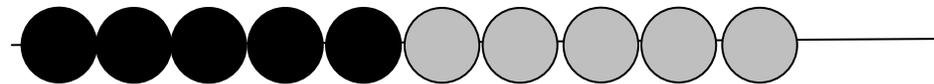
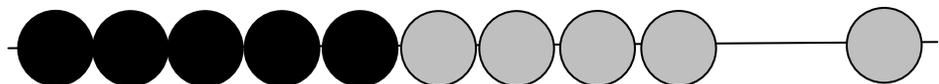
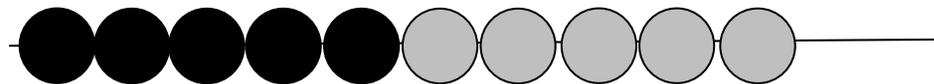
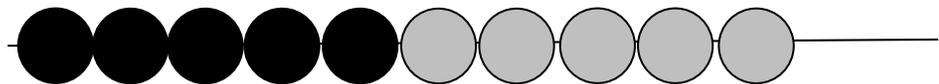
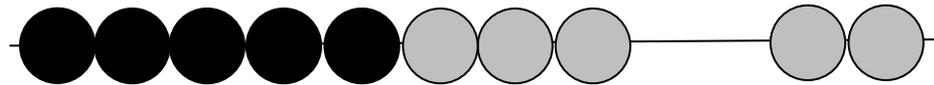
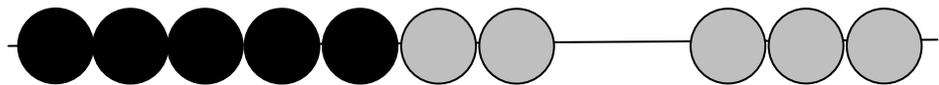
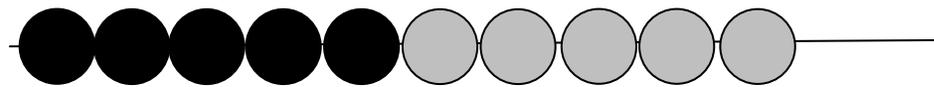
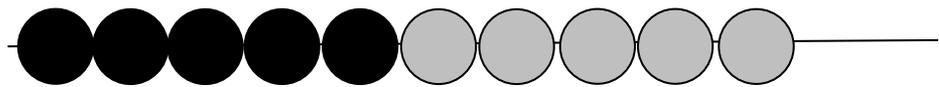
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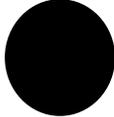
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