MAKE YOUR OWN MINI DOBBLE

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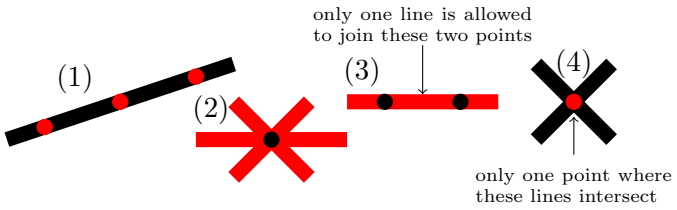
The game "Dobble" is based on a mathematical "finite projective plane". In a set of Dobble cards, any two cards contain a common symbol. We can build a geometrical system by putting cards with the same symbol on the same line.

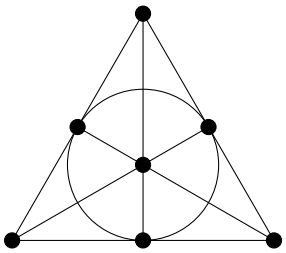
A finite projective plane is a set of points and lines such that:

(1) Every line contains at least three points
(2) Every point is in at least three lines
(3) Any two points are contained in a unique line
(4) Any two distinct lines intersect at a unique point

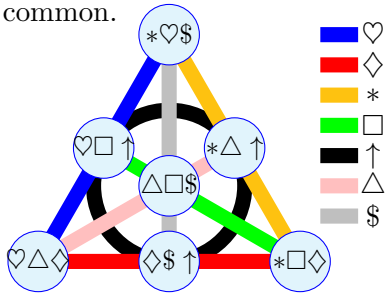


Lines do NOT have to be straight.

The smallest finite projective plane has 7 points, and 7 lines:



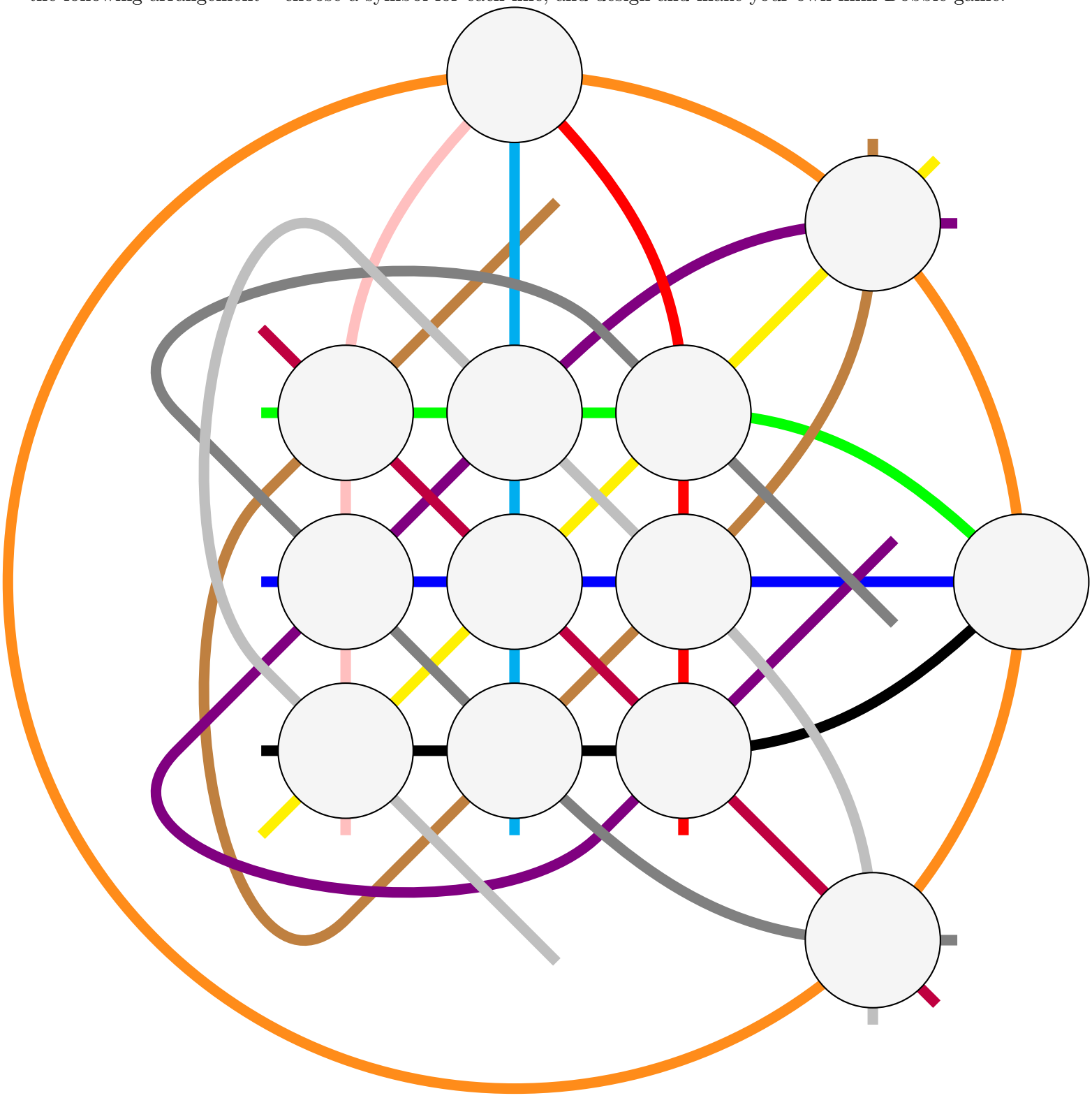
By giving each line a symbol, we can create a mini Dobble set of cards. Any two cards have one symbol in common.



Make your own!

Choose a symbol for each line, and fill in the cards accordingly. E.g., if you choose a heart line, which is the blue line in the above example, you put a heart on each card on this line. Once you've designed your set, take some of the card circles and make a version you can play with.

For a version of Dobble with 4 symbols per card, you can have at most 13 cards, and 13 different symbols, with the following arrangement – choose a symbol for each line, and design and make your own mini Dobble game!



E.g., you could draw frogs on the cards on the green line, and bananas on the cards on the yellow line. Choose your own 13 symbols!

If you want n symbols per card, and exactly one common symbol per card, it turns out you can have at most $n^2 - n + 1$ cards.

On this sheet we have finite projective geometries with 3 lines through each point (first side) and 4 lines through each point (this side). Constructions for many other cases are known, but noone knows if it's possible to draw a finite projective plane with 13 lines through each point and 13 points on each line.