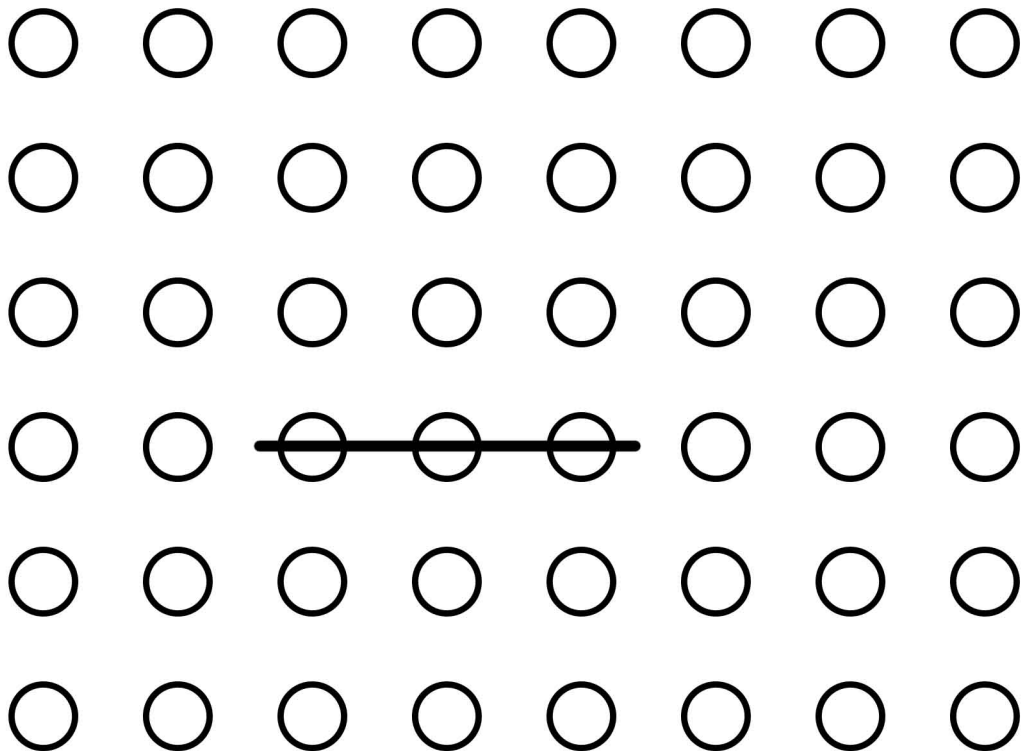# Handout: Cards as Lines

Imagine:

- each circle below represents a different OBJECT (you can color them in different colors, or draw different faces on each if you like).

- CARDS are represented by a line that goes through *three* circles.

So here's one card:

1. Add four more cards to the above picture. The lines DON'T have to be straight, but they must go through exactly *three* circles each.

2. Repeat (1), but this time make sure any pairs of cards share EXACTLY one circle in common.
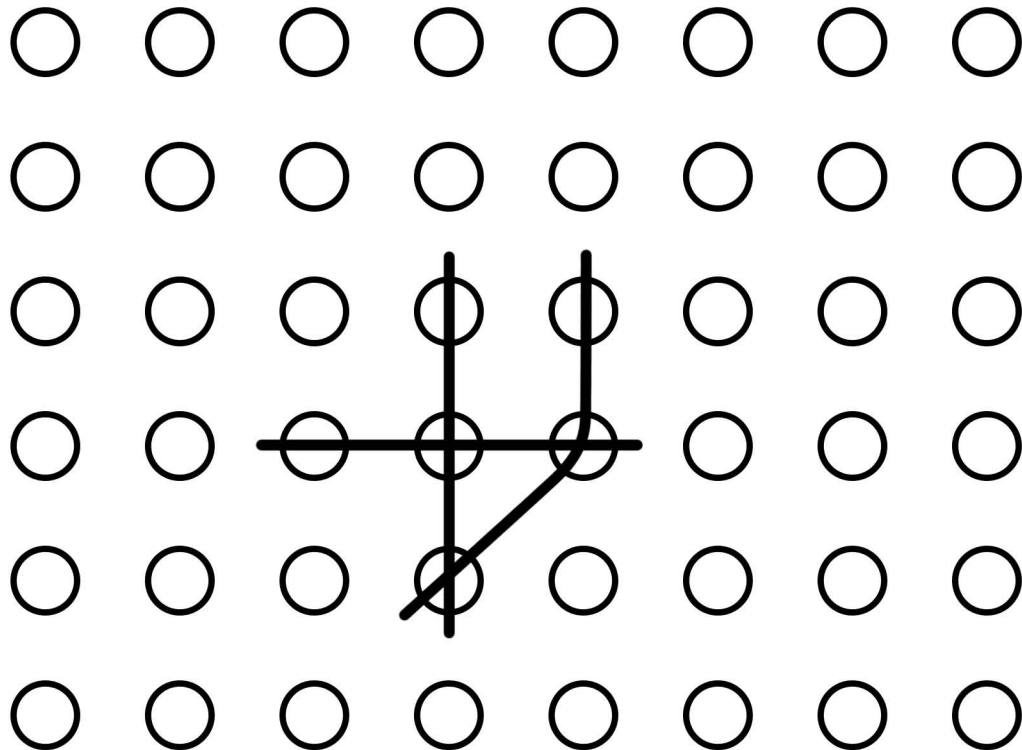
3. Consider this next picture:
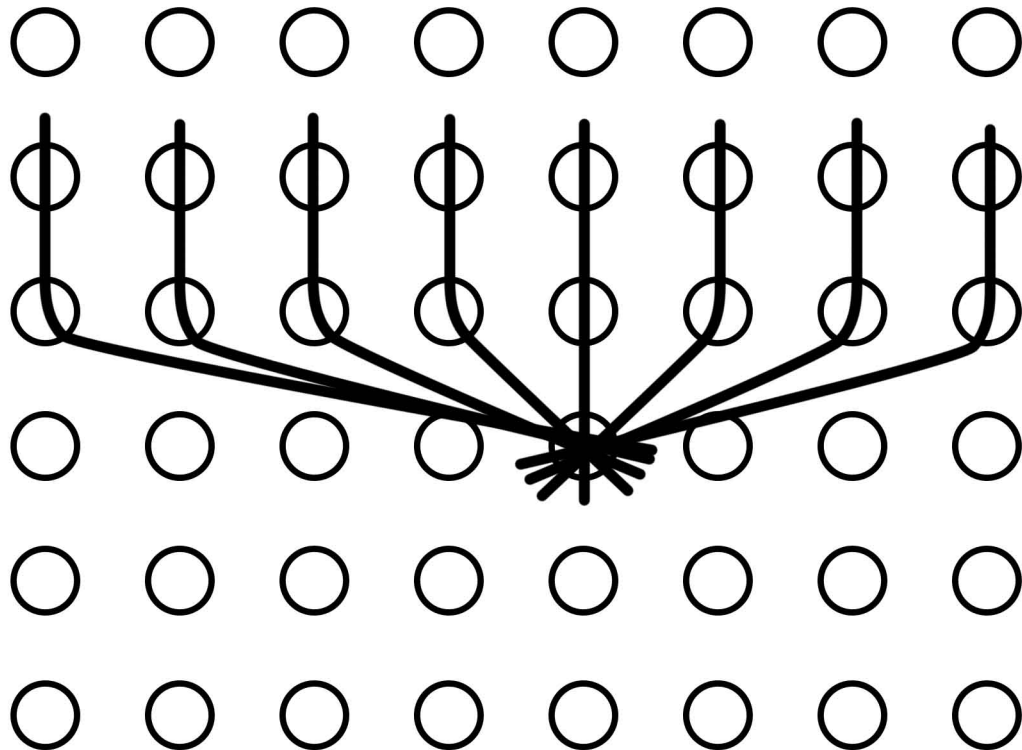
Describe how you could keep adding more OBJECTS and more CARDS to the picture so that every card continues to share exactly one object in common with every other card.

Is there a limit to the number of cards you can make?

4. Now suppose I've started you off on a new grid, with three cards to get you going:

How many more cards can you add to this picture so that *any two cards* still share EXACTLY one object in common.

5. Try explaining to your friends why you can't make as many cards as you want in question (4), even though you can in question (2).