when we go to a new place to eat, we know exactly what to do, even though we've not been there before. you wait to be seated, you order your food, you wait, eat, pay, and leave. now, you've never been to this place before, so it all looks different, sounds different, you have to move different to get around. but you still don't get 'lost'. this is because we know that the heart of what we're doing is the same as all the other times we've been out to eat.

We know this, but how does the brain know it? because we can't stick stuff in people's brains, to be able to answer this question in cells, we have to take this problem and make it make sense to animals that can't go out to eat.

we can do this with a game. the game is, the animal has to go to four places in the right order, getting a little drop of water at each place. We can call these places A, B, C, and D. Now, when the animal gets the water at D, it has to start the whole thing again. Once it gets good at finding these places in the right order, we change which places the animal has to go to. Thinking back to earlier, we're changing where the animal is going out to eat. we do this many times, and eventually the animal learns that it's always four places and start again. It's learned the game.

What about the brain? we can listen in to what brain cells are doing as the animals play this game. what we thought would be happening is something like this: a part at the front of the brain would have cells that care about whether the place the animal had to go to was A, B, C, or D, across the whole set of games. it wouldn't care about where A, B, C or D actually are. That would be taken care of by the part of the brain, a little further back, that we know cares a lot about space. these two things would be tied together each time the game changes.

This isn't what we saw. Instead, the front of the brain cared a little bit about both, and in a weird way. Maybe someone else could explain it in the ten hundred most used words, but i think it's hard. its like a music box. there are rings of brain cells that get excited when the animal gets water in that ring’s favourite place. the brain cells in the ring can make the cells next to them fire more. this firing is passed around the ring while the animal plays the game. once its moved on and got water three times, the ring says, we need to go back to that place again. there would be a ring for each place.

the music box is cool, but we think that somewhere in the brain, we will find a place that does care about A, B, C and D. people seem to have it, and we think it might be needed for the music box to form in the first place. I've just had some more animals play the ABCD game, but this time listening in on the part of the brain that we, at least used to, think only cares about space, which is pretty funny. there was some trouble along the way, but i'm about to run the numbers on this.

At the same time, we thought it was a bit weird that the part at the front of the brain cared about space in the way it did. other people haven't really found that. to look at this a bit more, and for all the brain cells at the same time instead of one at a time, i made my computer take the numbers from the brain firing and draw cool lines through it. this is, apparently, a normal thing to do. it turns out that the whole set of brain cells cares about what sort of place the animal is in, rather than where it actually is. something like: i am in a corner. I am in the middle. I am on the edge.

there is a hundred different things this could be, so i need to play around with it some more to work out what it means