

# MAPPING COGNITION USING *GAMES*

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**CONVENTIONAL COGNITIVE SCIENCE EXPERIMENTS ARE BORING.** People typically need to be incentivized to participate in them, even those who are super gung-ho about aiding in the advancement of science.

Plus, when you're bored and start thinking about what you're going to have for dinner tonight, the part of your mind that the scientists are trying to study is likely in a completely different state from what they're envisioning.

At the Brain Game Lab, we create experimental games that strike the balance between being simultaneously engaging and scientifically valuable.



## METHODS

We primarily focused on a game called Rainbow Run game this summer. You play as one of these adorable creatures hopping along a rainbow map:



Each color corresponds to a **pattern**, and once you memorize the patterns, you can move more quickly through the map. This is crucial because the tiles behind collapse, and you lose when the collapsing catches up to you.

Scan this code,  
please!



In this way, Rainbow Run tests a participant's ability to learn a series of motor movements in concert with their ability to recognize patterns.

We worked on designing the map in such a way that it would be easy to manipulate a variety of important experimental factors, such as the precise frequency of each pattern, the length of each pattern, and the order that the patterns are presented in. Given these initial parameters, the map-building function will always find a map if it is possible.

The creature hopping through the maze as the tiles behind it fade...

...and then **collapse collapse collapse.**

## CONCLUSION

This summer we tackled three main challenges:

1. **Creating a self-correcting map-building function**
2. **Integrating front-end and back-end technologies**
3. **Striking the balance between engaging design and scientifically viable frameworks.**

For the next few months, we will be finalizing our developments on these three fronts, polishing the app so it will be ready for launch by December, allowing us to collect our first batch of data!

Play the beta version at:  
<https://thebraingamelab.org/>

Two possible maps for the same sequence of patterns.

The first tile in each pattern and each gray tile are randomly placed. If the random placement leads the map to collapse in on itself, the function will start building the map again from the last viable spot and use a different random direction.

## REFERENCES

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