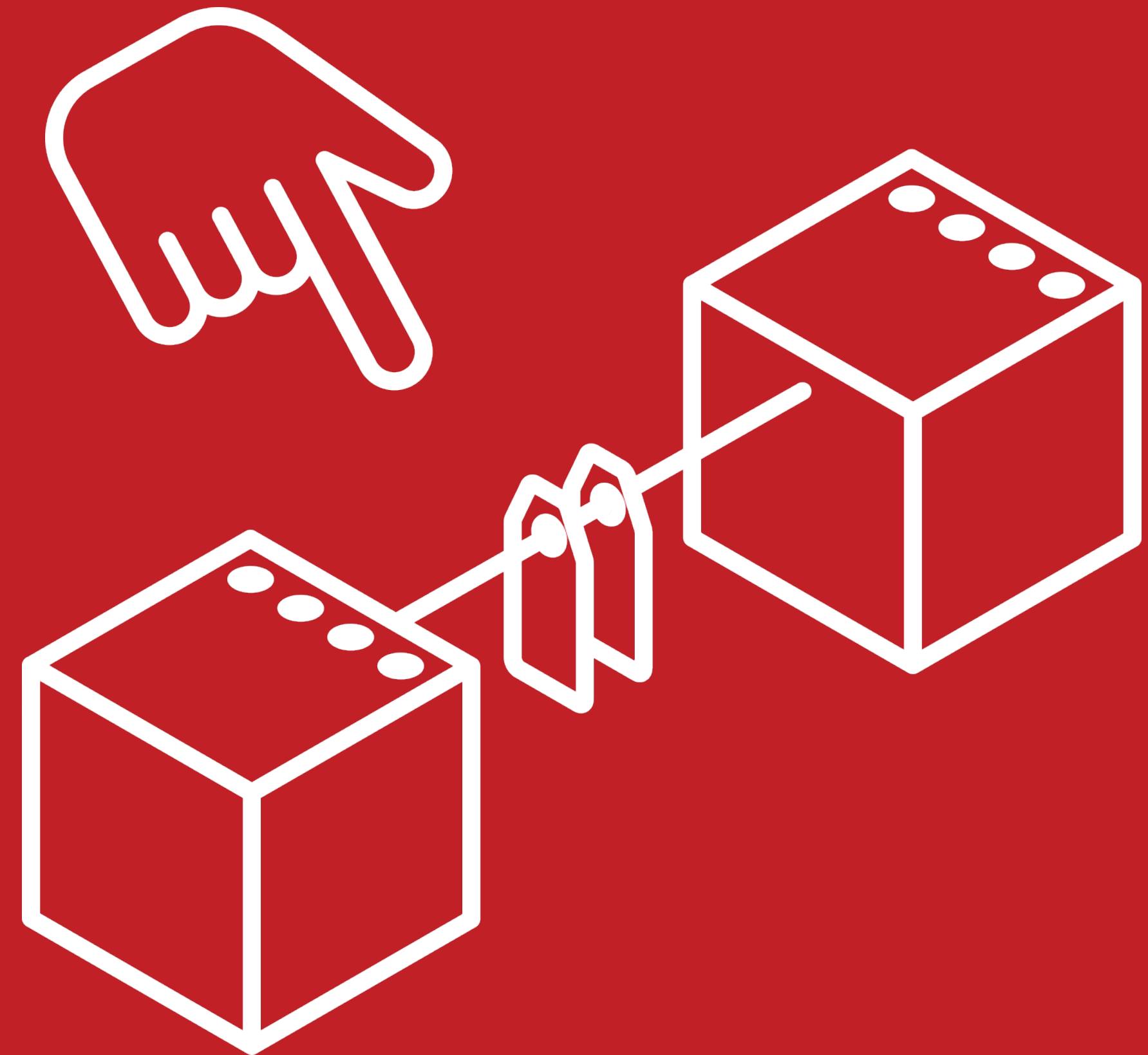


# Assessing by doing

Using a hands-on tool to assess and evaluate interdisciplinarity

Interdisciplinary Learning and Teaching  
Conference 7 April 2022  
University of Birmingham

David Earle and Katrine Lindvig, CoNavigator





# CoNavigator founding team

**David Earle**

Creative  
Director



**Katrine Lindvig**

Assistant Professor  
Higher Education Research




**Line Hillersdal**

Assistant Professor  
Medical Anthropology





The background of the slide is a photograph of the interior of a cave, specifically the Cueva de las Manos. The rock surface is covered with numerous handprints of various sizes, created by blowing red ochre pigment through stencils of hands. The prints are in shades of red, orange, and brown, contrasting with the lighter, textured rock. The overall effect is a sense of ancient human presence and artistic expression.

“  
Visualizations can be  
viewed as the permanent  
traces of gestures”

Tversky, B. 2010, Visualizing Thought,  
Topics in Cognitive Science 3 (2011) 500

Cueva de las Manos (Cave of Hands), Argentina. Art dates 13,000 – 9,000 years ago.



















UNEMPLOYMENT

STAFF

Poor  
Conditions

CONDITIONS

CULTURE

OVER  
CROWDING

Lack of  
Water

TOILET  
SANITATION

QUIET

Sanitation  
with toilet  
& water

Violence  
(achait)  
(threat of)

LEAD OF  
LINE /  
D/TAK

Control of  
Bully in  
Camp

ISOLATION

DRUG  
USE

Culture of  
Drugs

Drug Trafficking  
Support

Health Center  
Resources

Lack of  
Resources

LEARNED  
HEALTHY  
OBSERVATION

Instability -  
Observation

ISOLATION

Sense of  
Control Change

Productive

MEANINGFUL ACTIVITIES  
(use of)

Exercise  
Activity

Boredom  
use of

Lack of  
Structure  
Discipline

Lack of  
Structure  
Discipline















ISOLATION  
PHYSICAL  
Poor Conditions  
CONDITIONS

Power Imbalances  
CULTURE  
OVER CROWDING

DIET  
Lack of Water  
TOILET SANITATION

SPREAD OF ILLNESS / DISEASE  
Sanitation without availability

Control of Bully in Gangs  
Violence (actual + threat of)

Lack of Resources

LEARNER HELPERS

Sense of Control

Productive Change

Exercise

Constructive Experience  
Need for Meaning

Meaningful ACTIVITIES  
Lack of stimulation can impact on psychological well-being / sense of purpose / meaning

Access to diagnosis & treatment

Social Inequality

MENTAL HEALTH

Sense of continuity with valued relationships  
valued relationships going forward  
Capable for new

HUMANS ARE SOCIAL BEINGS - NEED SUPPORT FOR ENCOURAGEMENT / PROUD / MOTIVATION TO STAY WELL / POSITIVE

DRUG TREATMENT SUPPORT

MENTAL HEALTH RESOURCES

MEDICAL CARE + PROVISION

Wider Stigma around mental health

Barriers - due to language used

MEDICAL RESOURCES / ACCESS TO MEDICINE

Psychology

DRUG USE

Isolation from mentals

Activities are important to avoid boredom, thinking etc. But need to be meaningful.

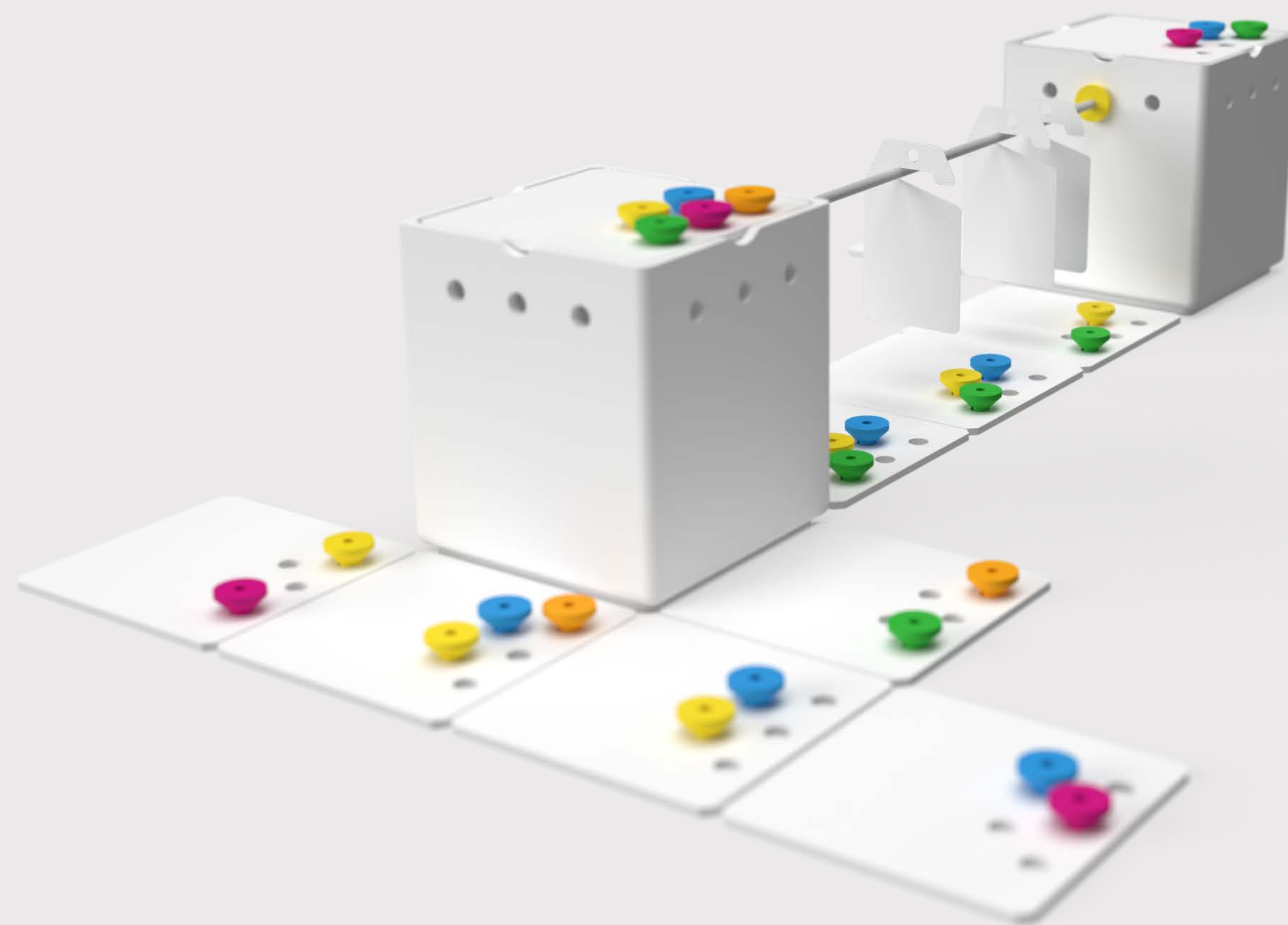
Activities offer opportunity for connection with others and own sense of purpose / meaning

Physical Educational Activities

Lack of

Control of Drug

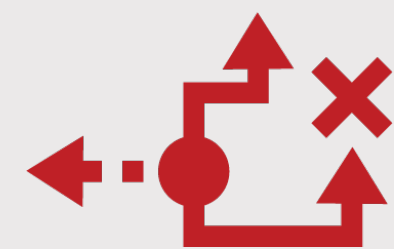




**Our goal:** a universal,  
all-purpose collaboration  
tool for any group or team



# Current status: extensive use in academic, public and private sector settings since 2016 in four broad uses



## Strategic planning

Economic & Social  
Research Council, UK  
  
College of Science and  
Engineering Research,  
Leicester, UK  
  
University of KwaZulu-Natal,  
South Africa



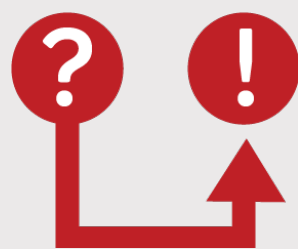
## Exploration

Governing Obesity Summer  
School, University of  
Copenhagen  
  
Undergraduate Course,  
University of Maryland, BC.  
  
NSF & UMBC, Masters  
Programme  
  
DFDS



## Evaluation

NASA & National  
Science Foundation, USA  
  
Leicester Institute for  
Advanced Studies



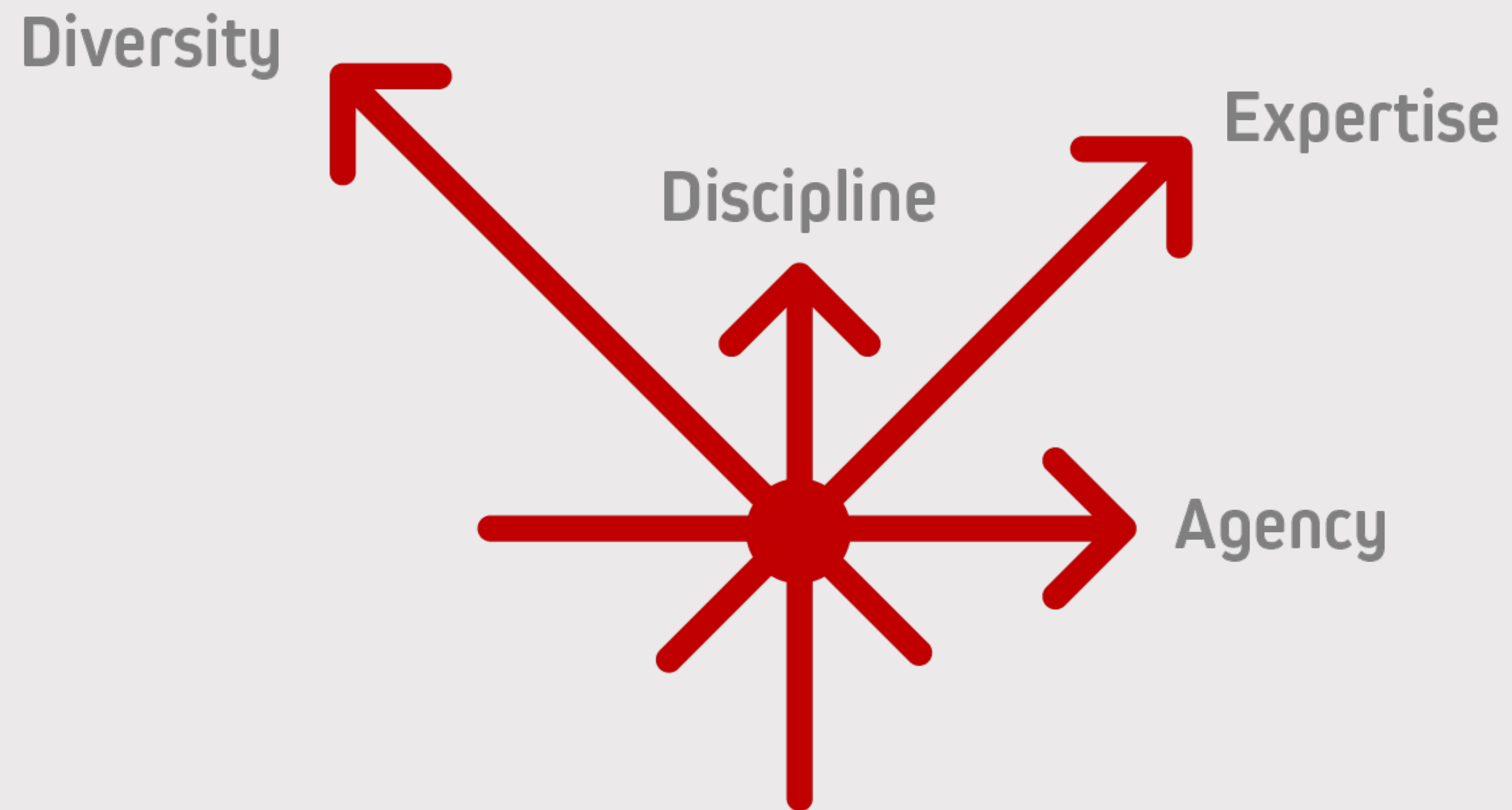
## Problem Solving

Department of Criminology  
University of Leicester  
  
360 Possibles, Rennes  
France  
  
Medical Museion,  
Copenhagen  
  
DFDS





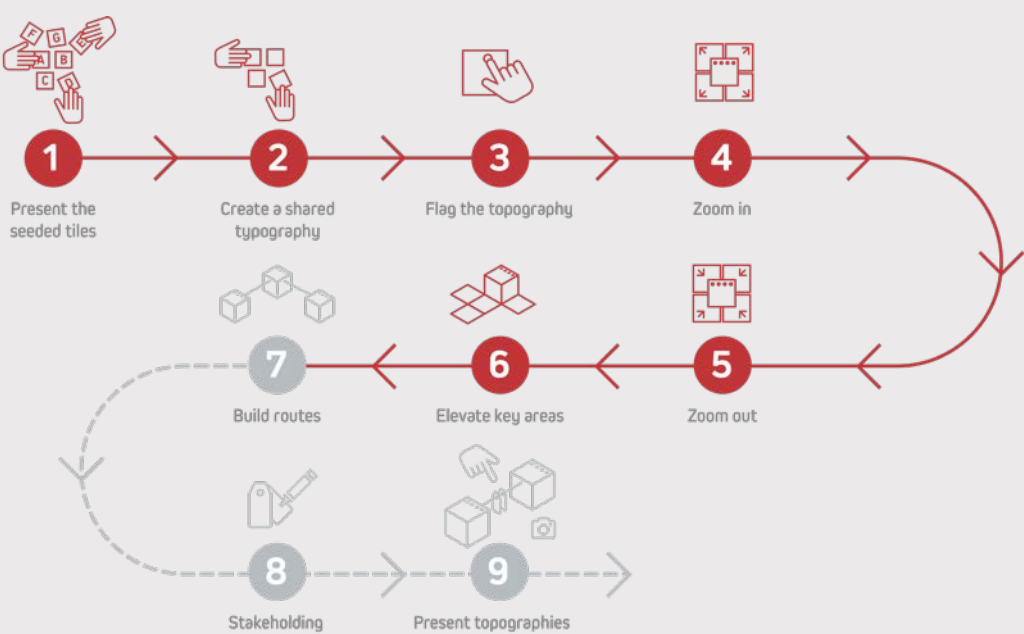
## The intersections of collaboration:



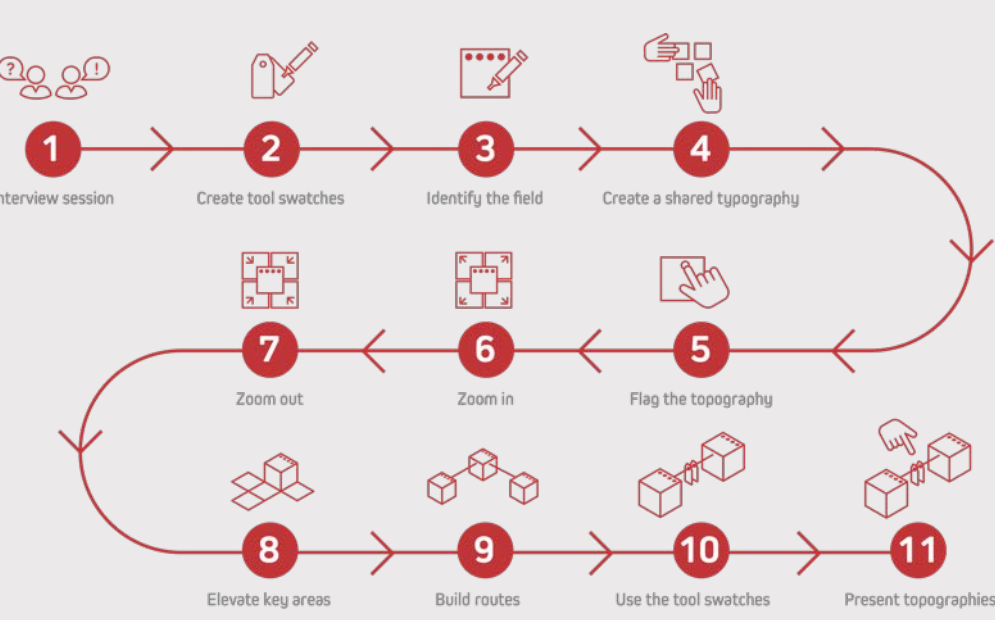


# Component-based structure for configurable sessions according to time, participants, context and desired outcomes

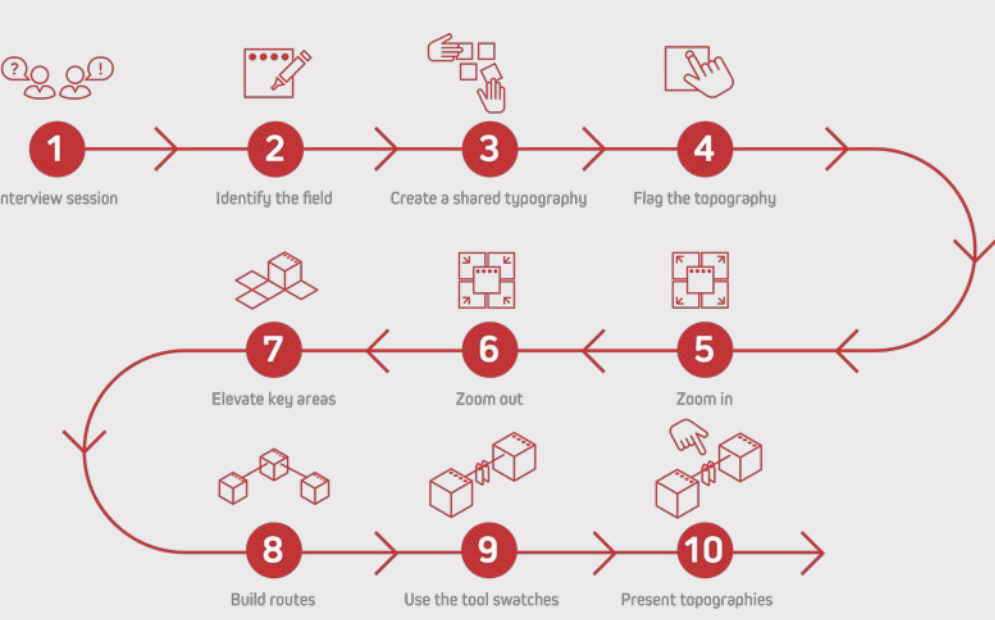
Multiple seeded strategic planning



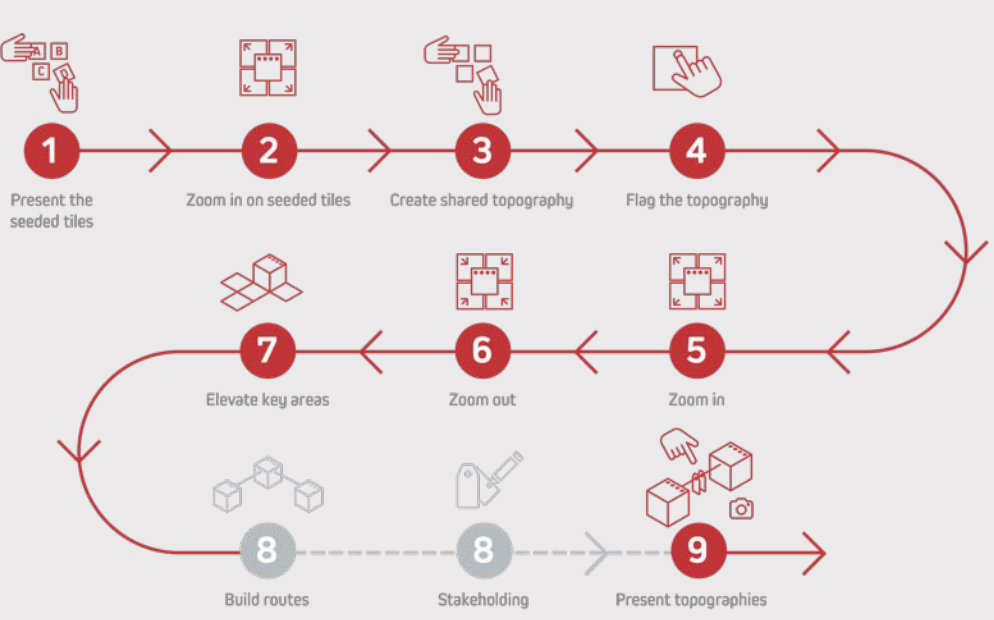
Introductory CoNavigation



Exploratory CoNavigation



Seeded strategic planning





# New configurations can be designed in collaboration with users for specific workflows and desired outcomes.

## Basic exploratory CoNavigation

A basic CoNavigation is ideal with more than one group, as an introductory, exploratory and pedagogical exercise. Its chief outcome is the process itself, and the key learnings take place during the act of CoNavigation, and from the final shared presentations.

- 1 Introduction session.** Participants split into pairs. They then each spend five minutes interviewing each other to the extent where they will each be able to 'present' the interview to the rest of the group. Collaborative to participants can introduce themselves to the group as a whole.
- 2 Identify the chosen theme.** Using the blank tiles and unlabelled markers, each participant individually writes all the aspects of the theme that comes to their mind. Participants can ask themselves, "what do I think is important or relevant to the theme?"
- 3 Create a shared topography.** Participants stand around the table and together build a shared, negotiated topography of the given theme. This can be arranged in clusters or patterns based on whatever approach is agreed upon by the group. All tiles should be visible.
- 4 Flag the topography.** With a specific colour for each participant, they individually place a single peg on each tile which they think is essential to the topic. (though not necessarily something they or their discipline has direct knowledge or control of). This includes their own tiles.
- 5 Zoom in.** If there are tiles with three or more flags, each person should then write on a new tile what it was about that tile which drew them to it. The four new tiles are discussed and placed underneath the original tile. Participants then flag the new tiles. They can also rewrite the original tile to better describe the four new tiles as a whole. If the new tiles generate more than 3 flags themselves, repeat the zooming in process on these tiles.
- 6 Zoom out.** If there are areas on the topography which contain one or no flags on them, groups can decide that there might be a way of grouping these tiles to make them more essential. They can move the tiles and create new clusters or connections, or they can also write a new tile which describes a cluster as a whole and place it on top of the cluster.
- 7 Elevate key areas.** Participants look at the entire set of tiles, including those which have been zoomed in and out of. Each person decides which tile represents the area which needs most attention in the given field. Elevate these four using the cubes.
- 8 Build routes.** Groups discuss why each person has elevated their tile. They then look for connections between the areas they think are crucial and others'. They then discuss how these connections might arise and build a route between the cubes.
- 9 Stakeholding.** Participants look at each of the connections and their own tool switches. They discuss in their own words what they could do to strengthen or build connections between the connected cubes, and participants can choose to flag this tile. Learns can decide to make a new cluster from different parts of the board. If they think this will generate a more popular tile.
- 10 Present the topographies.** Each table takes turns to present the narratives of their topographies, the journey that took them to this particular end point, and what they learned on the way.

## Exploratory – reaching uncommon ground

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## Problem building

The seeded session can follow a preliminary session, when the planning team has CoNavigated what the seeded tiles are. Alternatively, an individual researcher or planner may decide on their own seeded tiles.

- 1 Present the seeded tiles.** Each group is given four seeded tiles in a box which have been pre-written and out of. Each person decides which tile represents the area which needs most attention in the given field. Elevate these four using the cubes.
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## CoNavigator

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- 2 Create tool switches.** Each participant then presents the tools of the person they have interviewed to the rest of the group. Each tool that is identified is written onto a separate tool and during the presentation, by the person being presented.
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## Strategic planning for groups – preliminary session

The first session will focus on deciding the core themes which will be CoNavigated further in future sessions. This will often be carried out by the planning team only.

- 1 Identify the chosen theme.** Using the blank tiles and unlabelled markers, each participant individually writes all the aspects of the theme that comes to their mind. Participants should ask themselves, "what do I think is important or relevant to the theme?"
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- 7 Record the outcomes.** Participants look at each of the connections and their own tool switches. They discuss in their own words what they could do to strengthen or build connections between the connected cubes, and participants can choose to flag this tile. Learns can decide to make a new cluster from different parts of the board. If they think this will generate a more popular tile.
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## CoNavigator

## Strategic planning for groups – seeded session

The seeded session can follow a preliminary session, when the planning team has CoNavigated what the seeded tiles are. Alternatively, an individual researcher or planner may decide on their own seeded tiles.

- 1 Present the seeded tiles.** Each group is given four seeded tiles in a box which have been pre-written and out of. Each person decides which tile represents the area which needs most attention in the given field. Elevate these four using the cubes.
- 2 Zoom in on seeded tiles.** If there are tiles with three or more flags, each person should then write on a new tile what it was about that tile which drew them to it. The four new tiles are discussed and placed underneath the original tile. Participants can then choose either to flag the new tiles, or to write a new, single tile which better describes the four new tiles as a whole.
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- 9 Present the topographies.** Each table takes turns to present the narratives of their topographies, the journey that took them to this particular end point, and what they learned on the way.

## CoNavigator

## Shorter exploratory CoNavigation

A shorter exploratory CoNavigation is a quicker paced version of the the basic, where interviewing, tool switching and bridging are not necessary. It is ideal for elucidating the common and uncommon ground in a given topic.

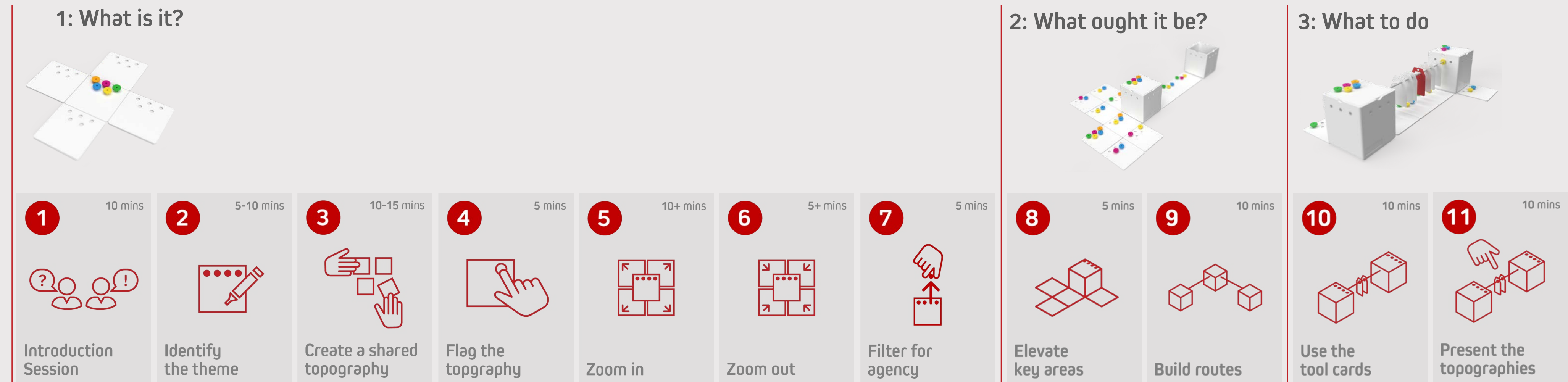
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## CoNavigator

# CoNavigator

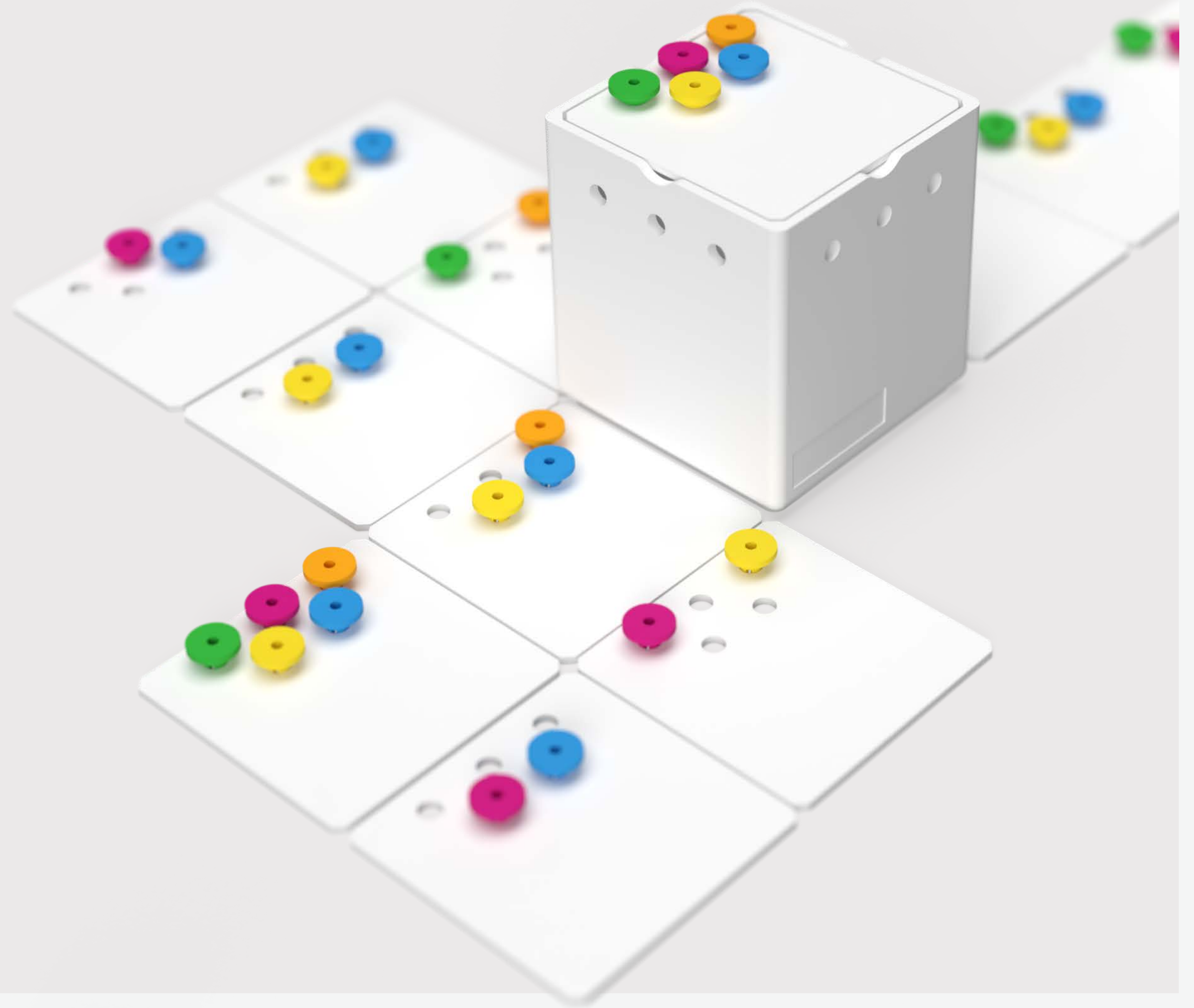


# CoNavigator session design: the three core stages



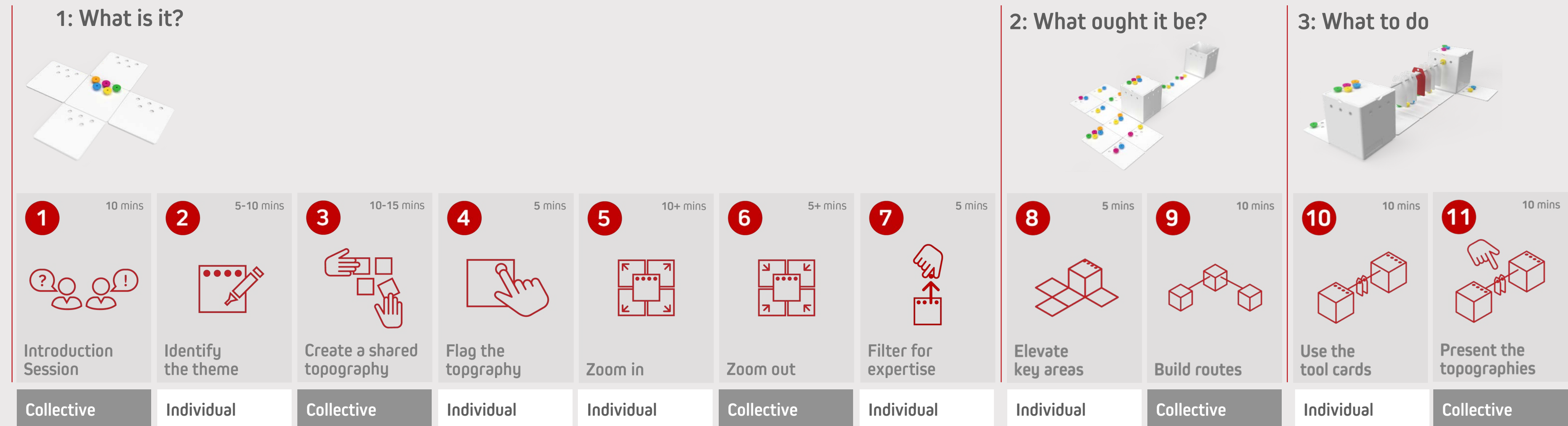


# Combining egocentric and allocentric navigation





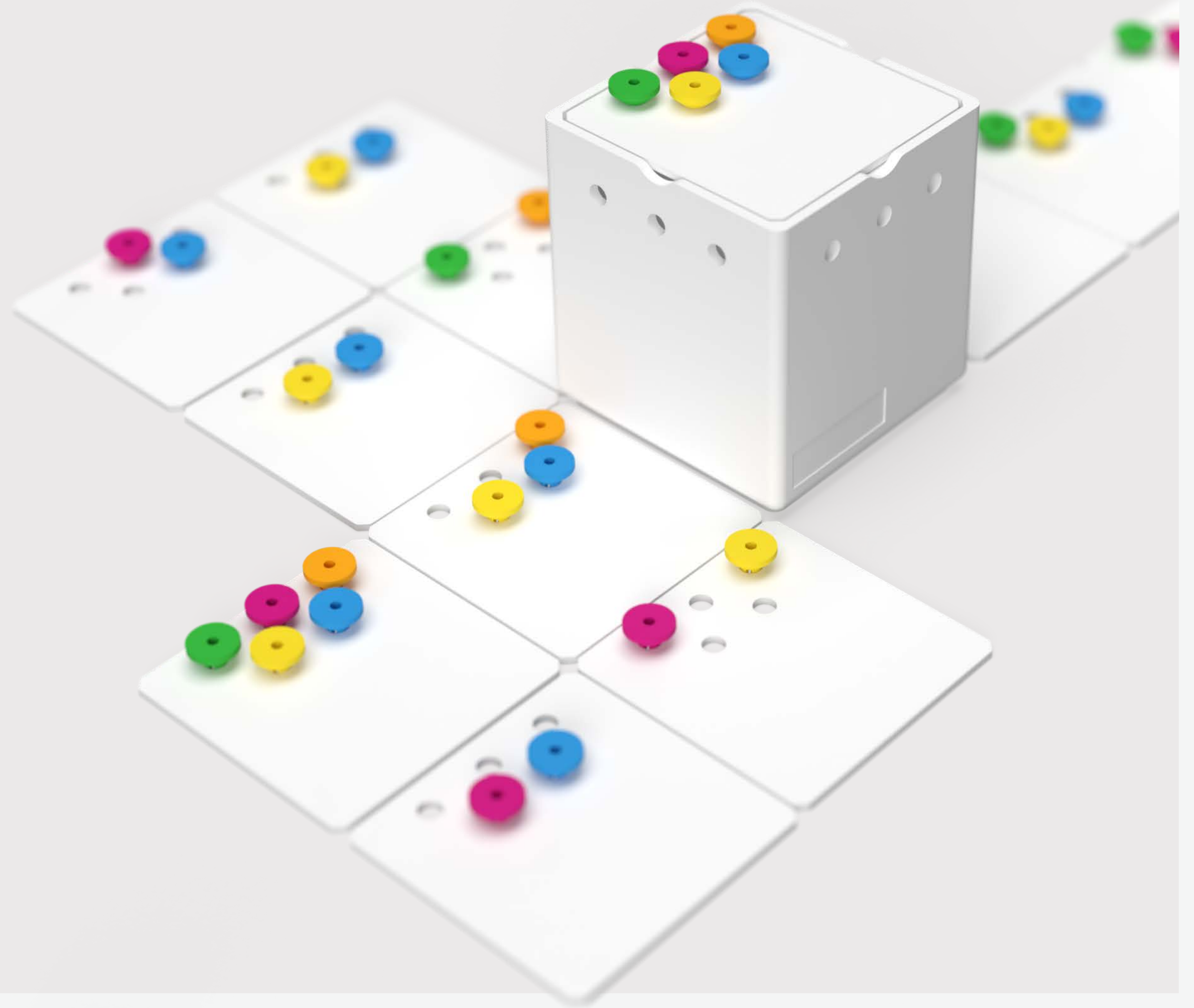
# CoNavigator session design: individual versus collective



All individual steps are presented and typically discussed with the entire team.



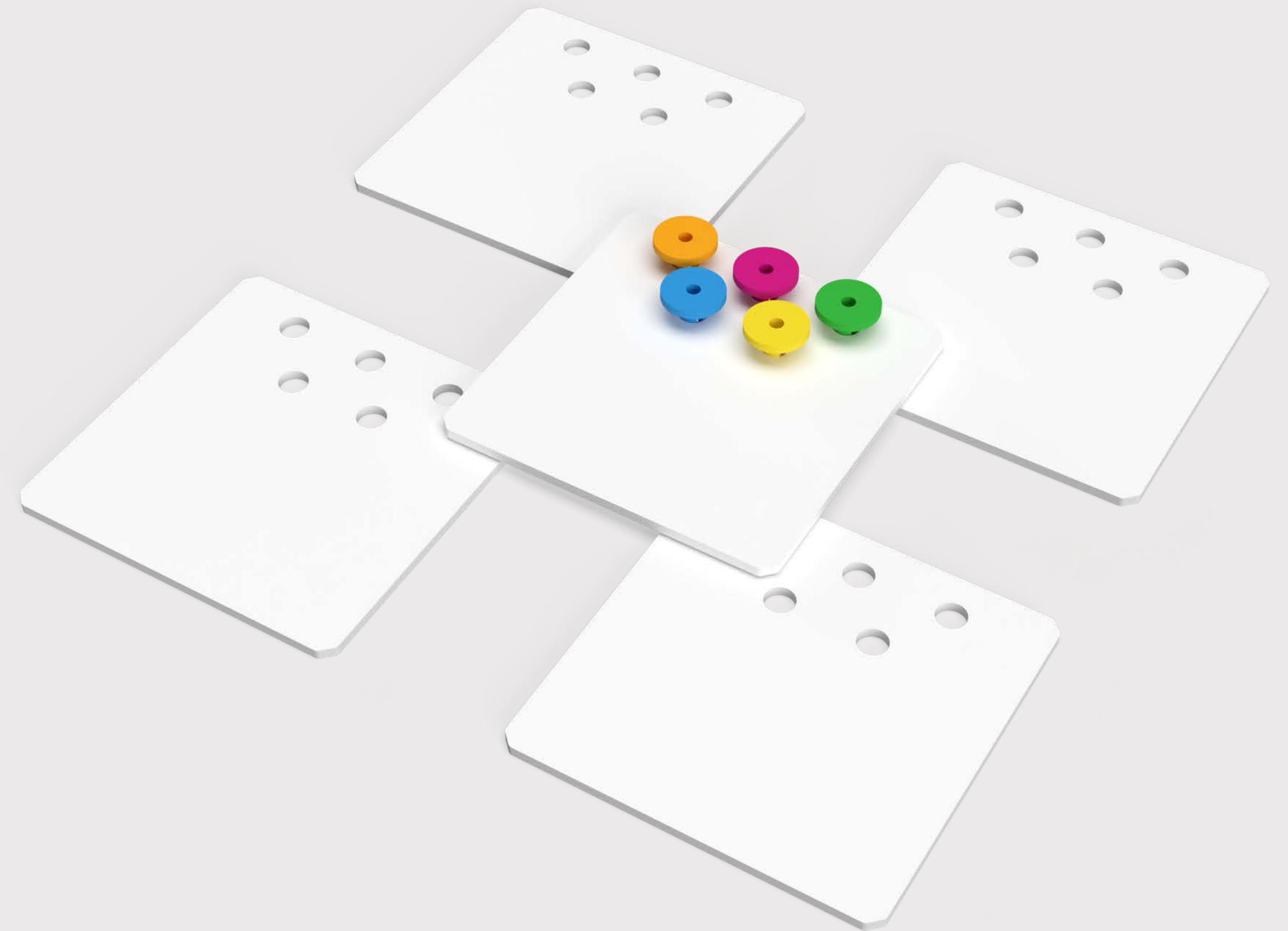
All voices seen and heard.





“People can only agree  
about what they’re not  
really interested in.”

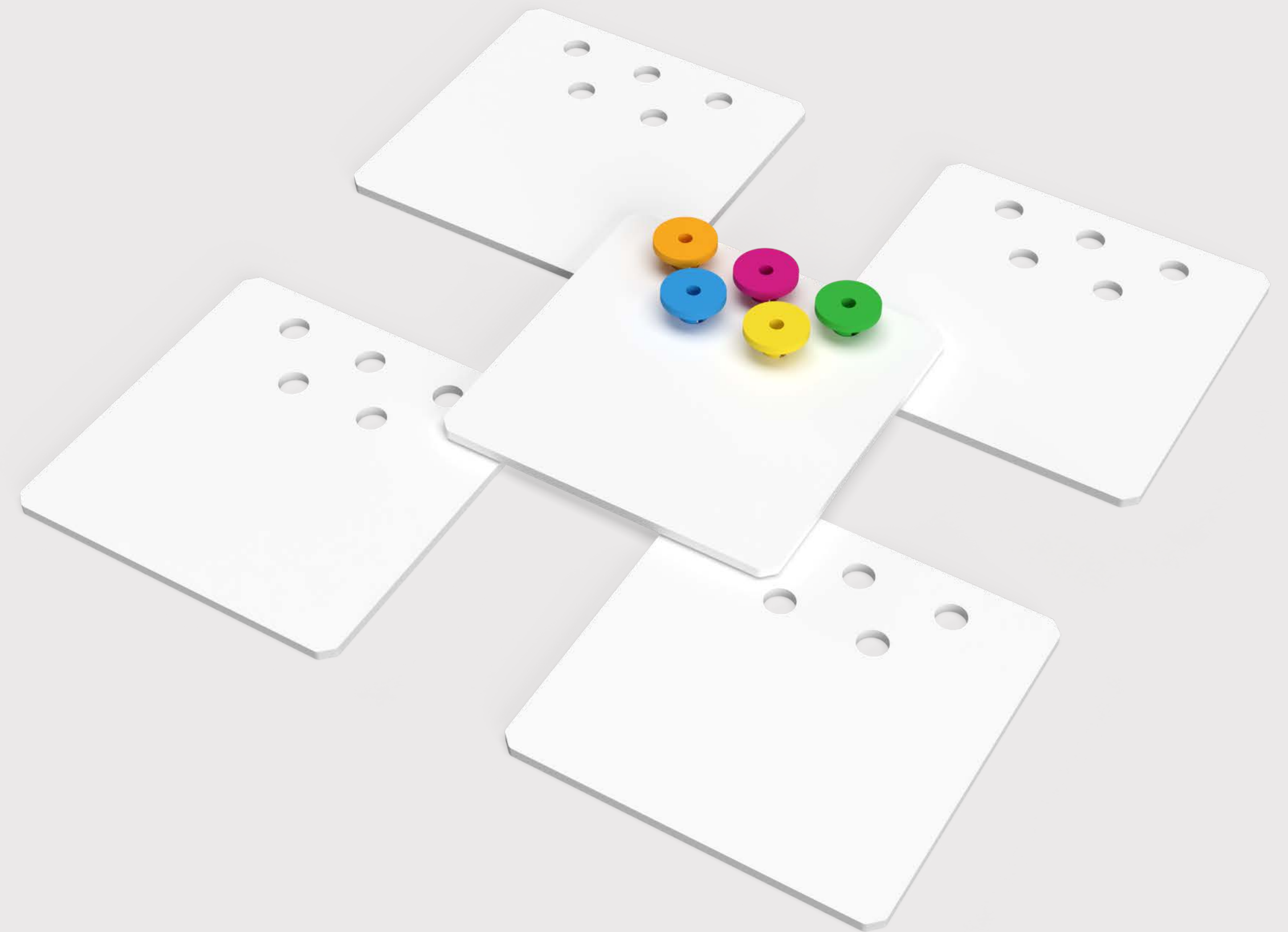
Bertrand Russell





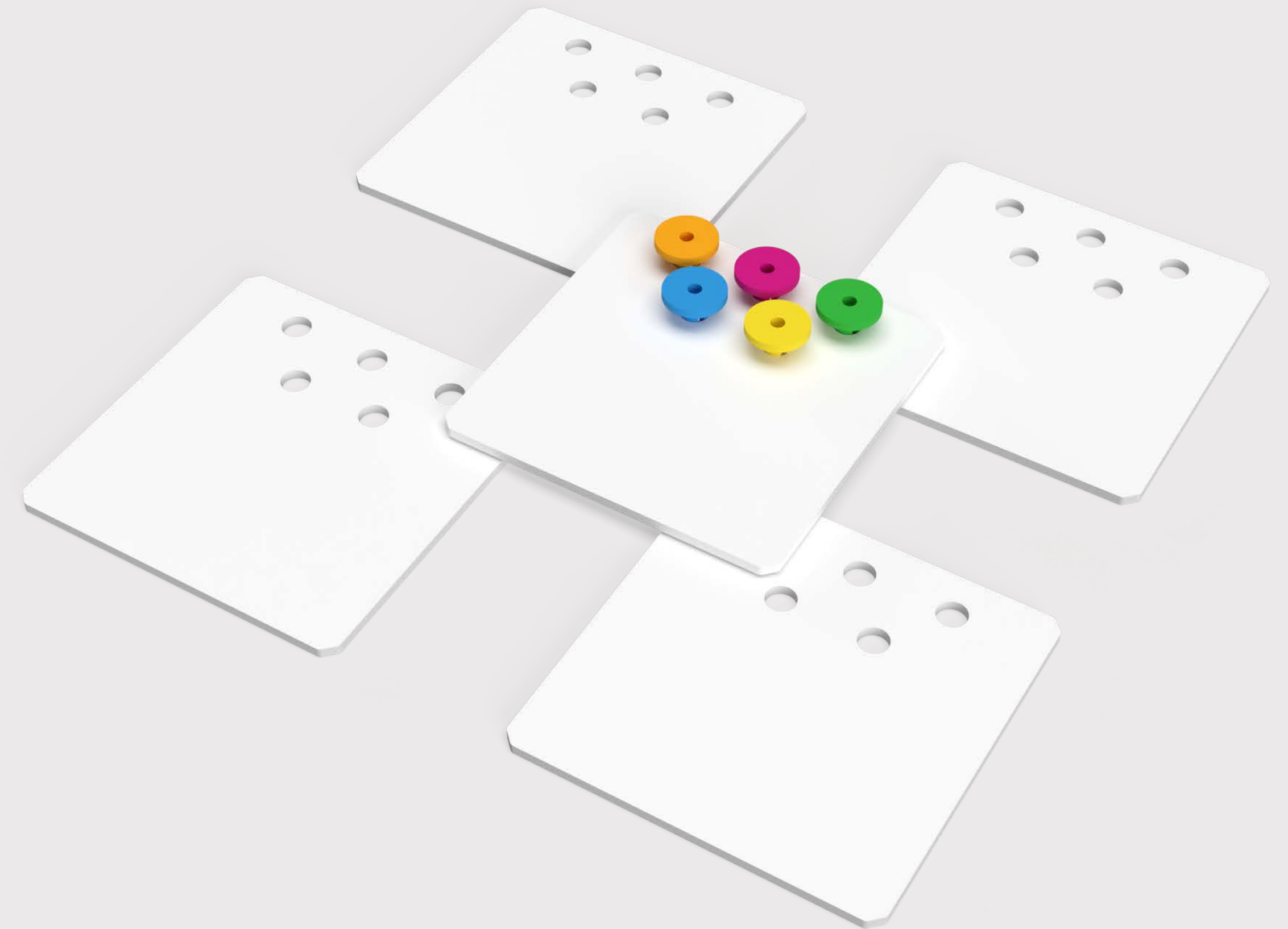
“We demand rigidly  
defined areas of doubt  
and uncertainty.”

Douglas Adams



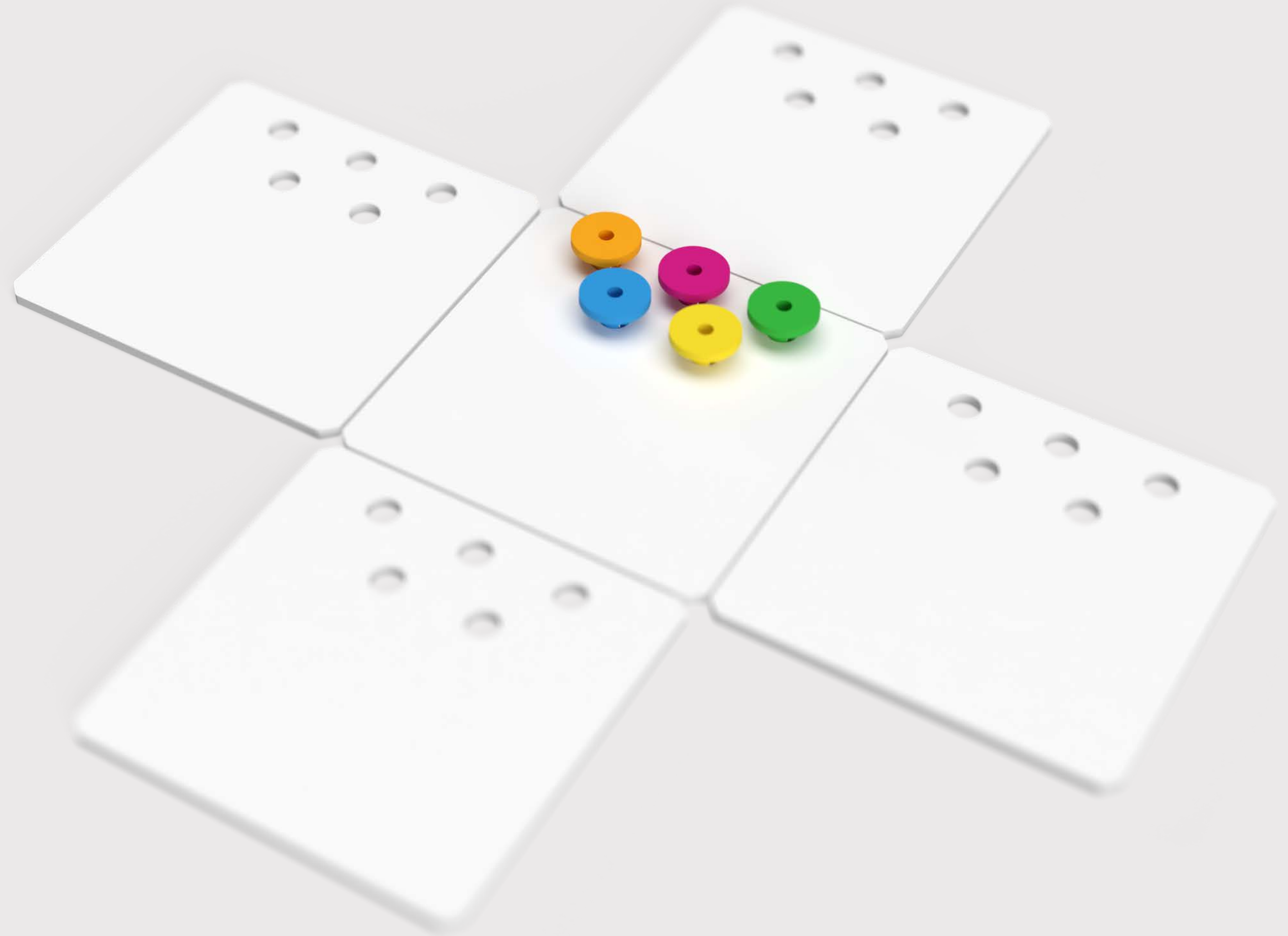


Reaching common ground.  
Revealing uncommon ground.



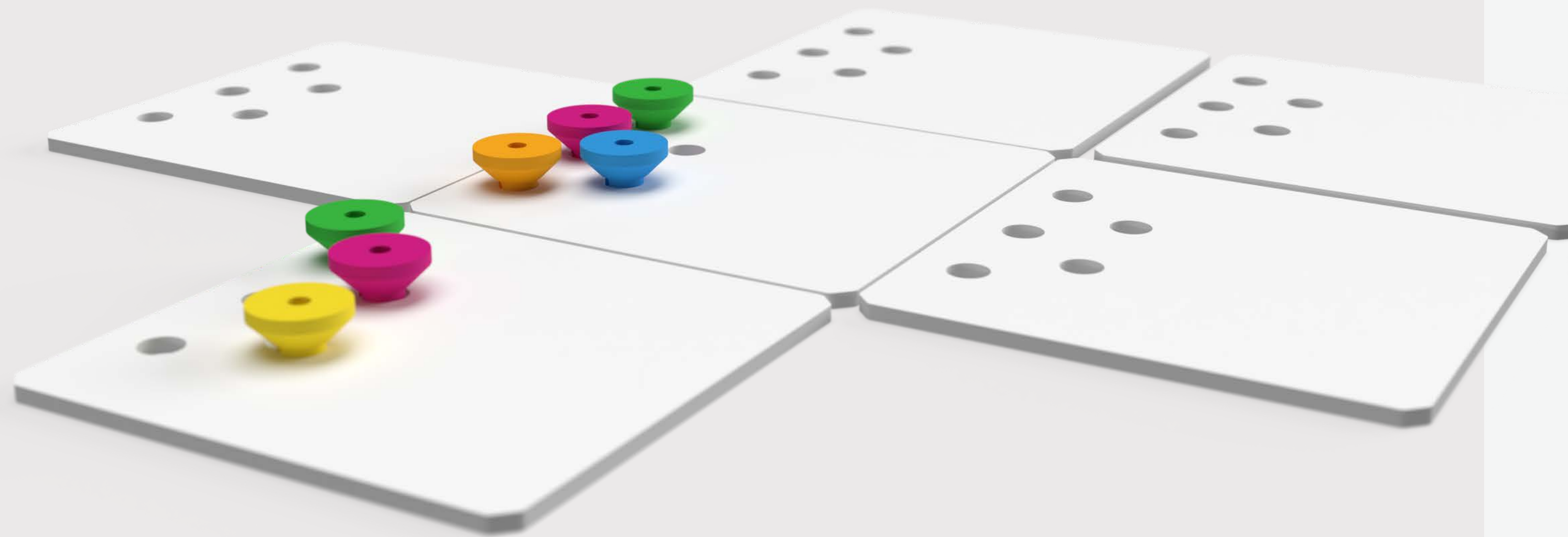


Calibrating the narrative  
to match the team





Filtering for agency





# Agency deserts





# Collective Narratives





“I had the landscape in my  
Arms as I painted it. I had the  
landscape in my mind and  
shoulder and wrist.”

Helen Frankenthaler, Artist.

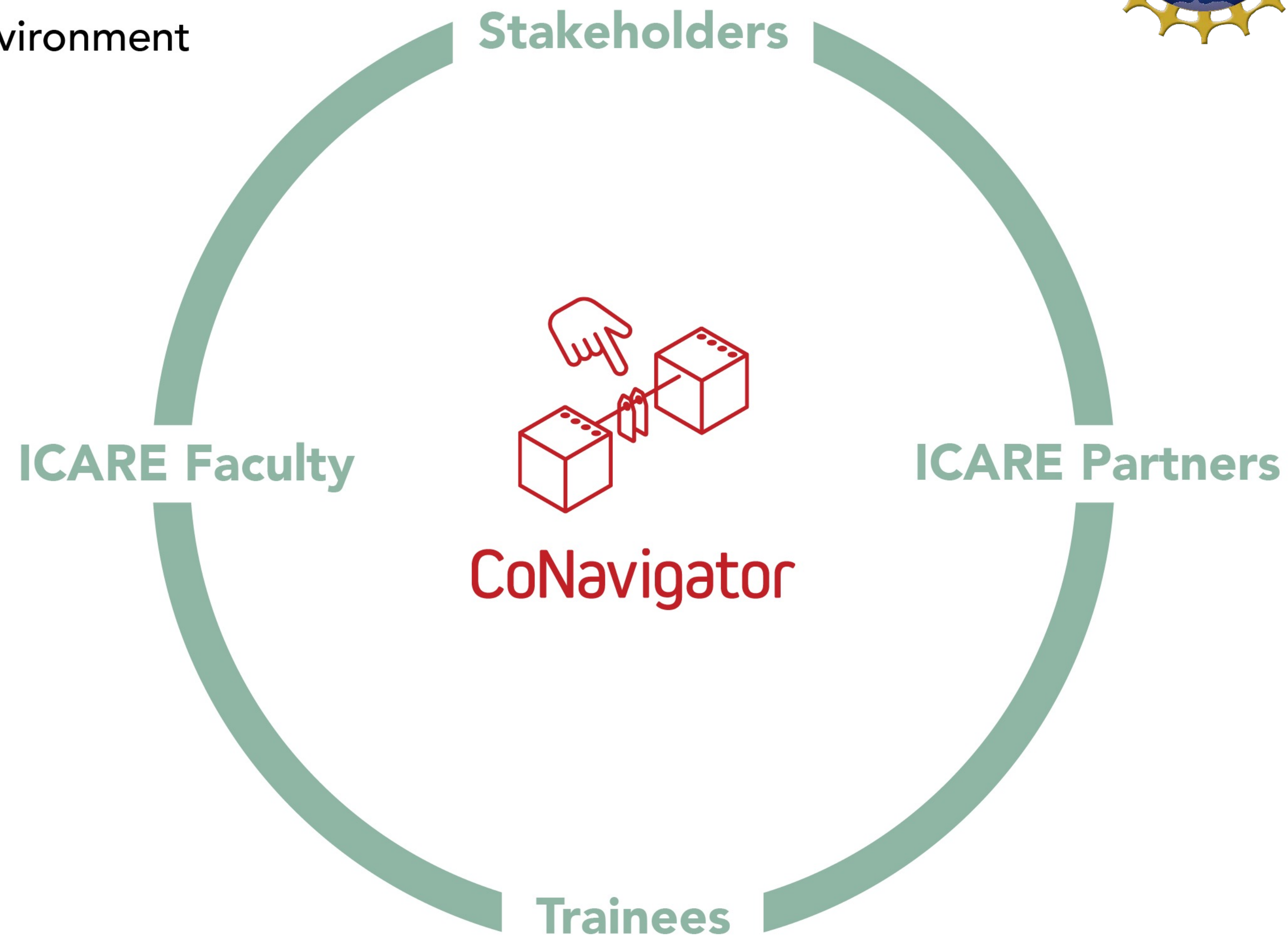
‘Bilbao’. Helen Frankenthaler, 1998





# ICARE at UMBC:

Interdisciplinary Consortium for  
Applied Research in the Environment





# ICARE at UMBC:

Interdisciplinary Consortium for  
Applied Research in the Environment





# ICARE at UMBC:

Interdisciplinary Consortium for  
Applied Research in the Environment



## Stakeholders

Activists  
Business owners  
Community members  
Legislators

## ICARE Faculty

Biological Sciences  
Chemical, Biochemical and  
Environmental Engineering  
Geography & Environmental Systems  
Marine-Estuarine Environmental Sciences  
School of Public Policy

## ICARE Partners

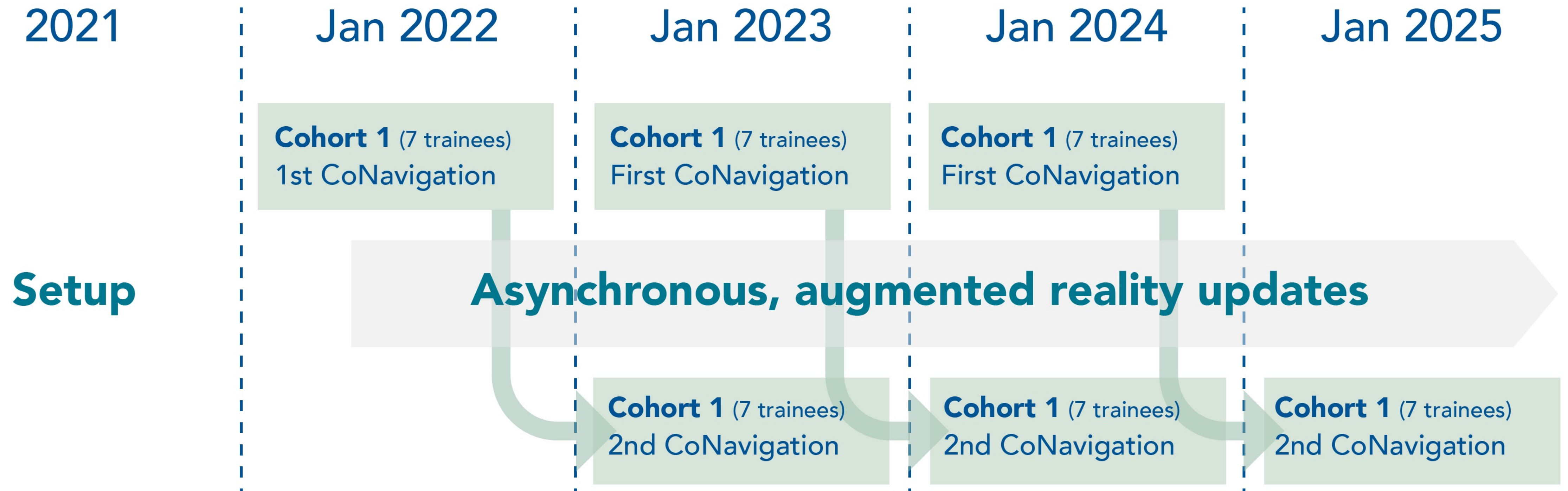
Baltimore City Department of Works  
Blue Water Baltimore  
Chesapeake Bay Foundation  
EcoLogix  
Limno Tech Inc  
Maryland Env. Service  
National Aquarium  
Parks and People  
Patuxent Research Center  
South Baltimore Land Trust  
UMCES, USFS, USGS  
Waterfront Partnership

## Trainees



# CoNavigator for ICARE at UMBC:

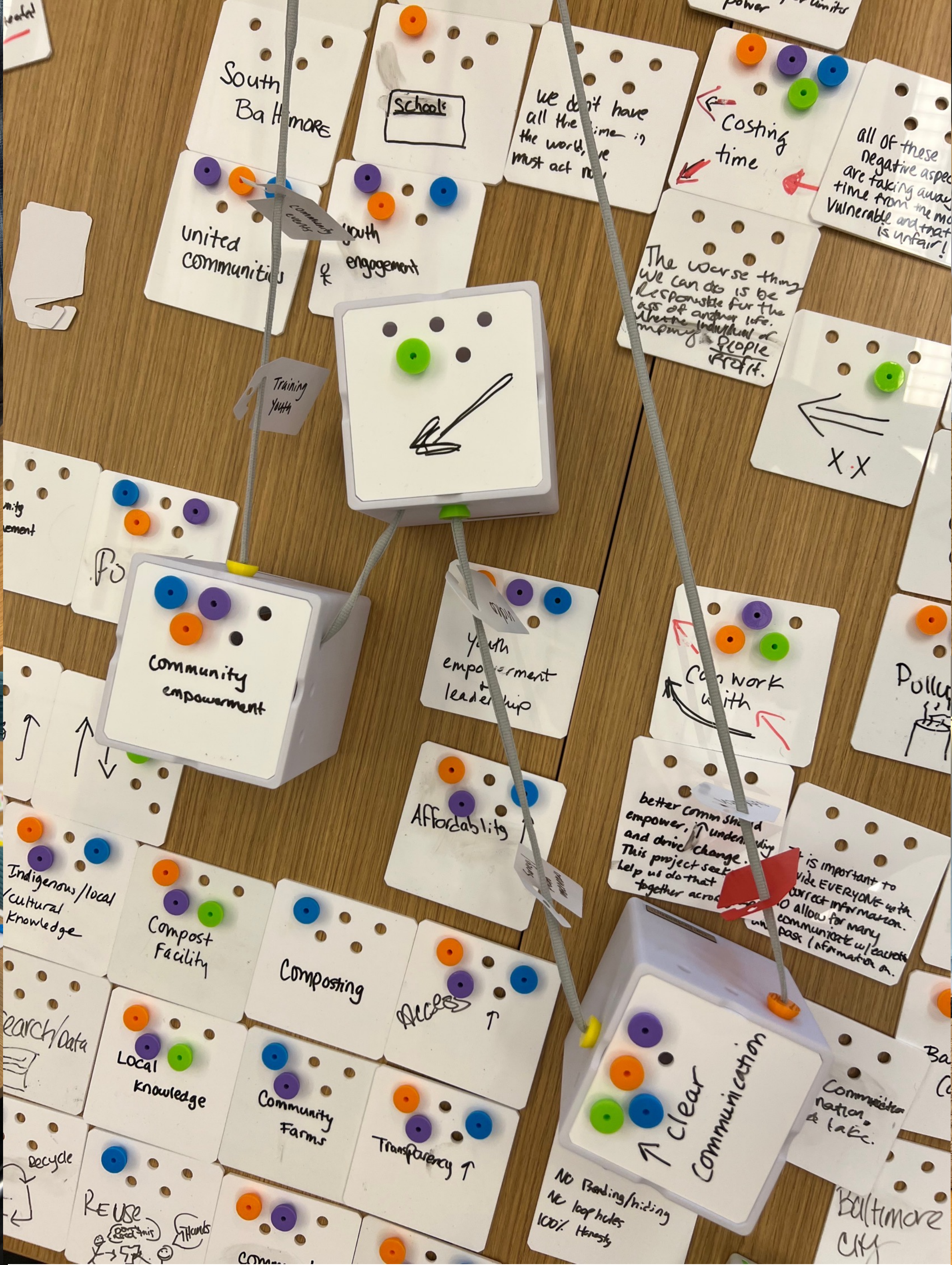
Timeline for the \$2.8m/5yr Masters' level training program (NSF# 1922579)



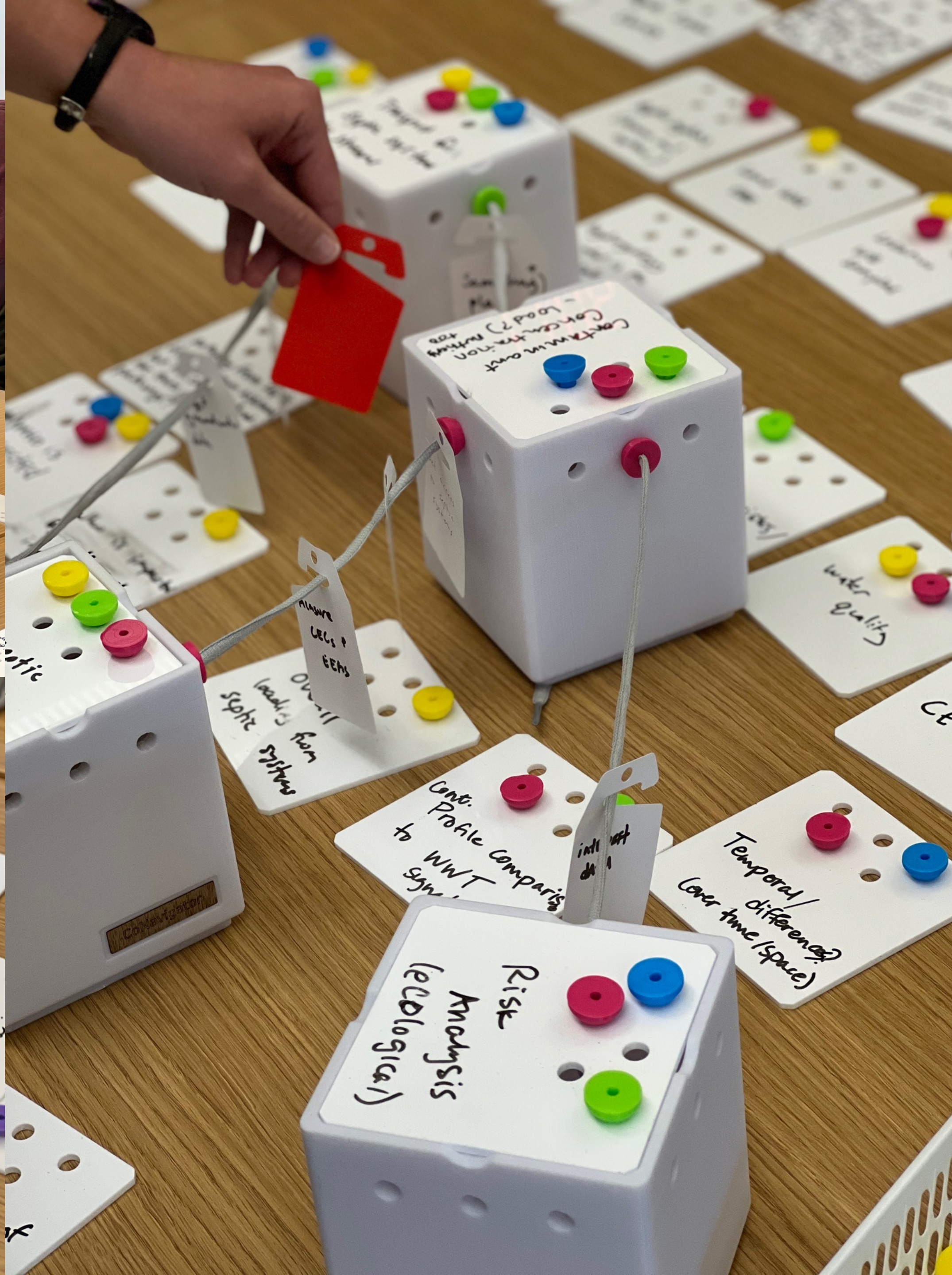
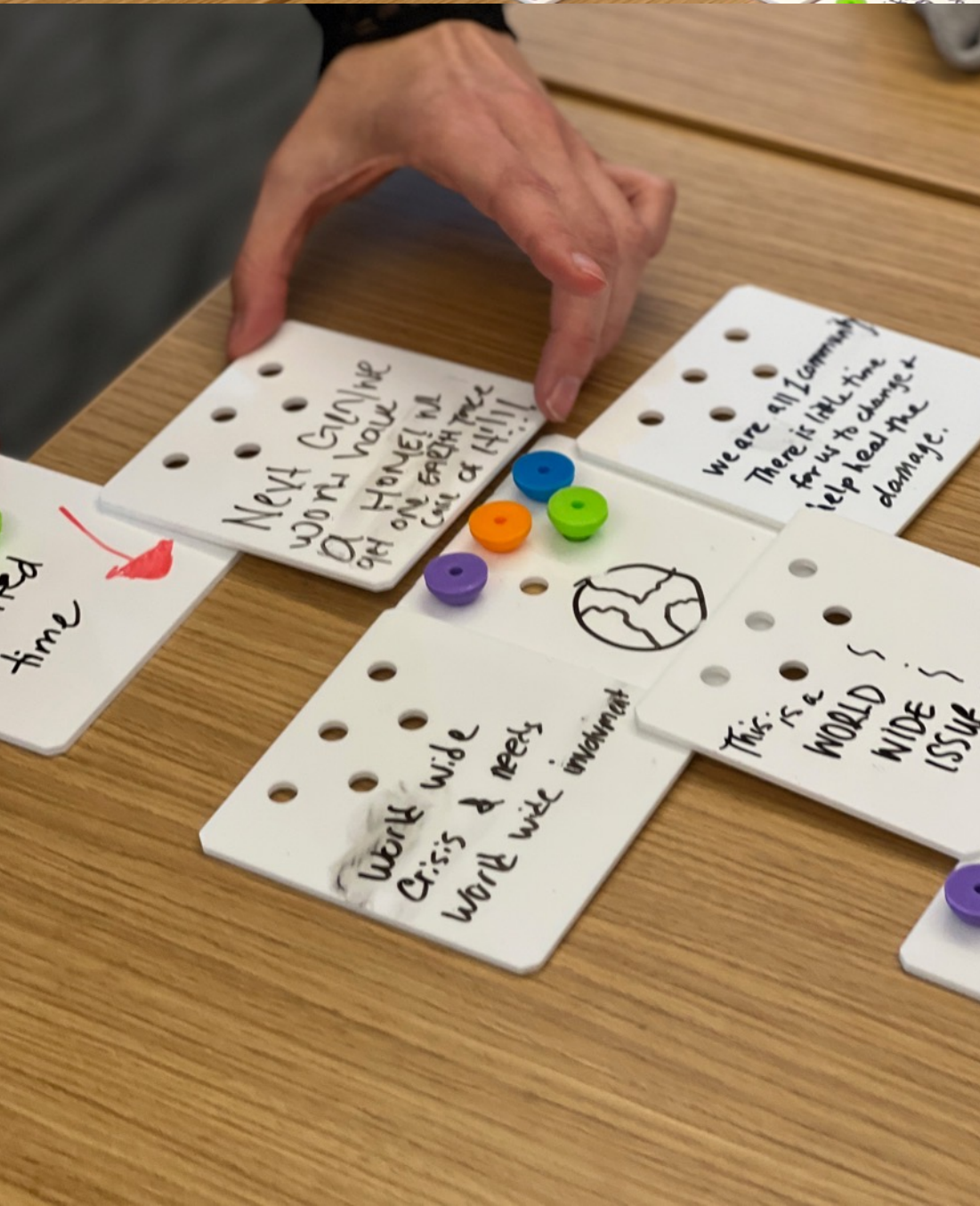
















UMBC, Monday 28 March, 2022.

CoNavigated theme:

# Understanding the effects of failing sewer systems

ICARE Trainee:

● Tyrāh Cobb-Davis

UMBC Mentor:

• **Andy Miller**

• Matt Baker

### Partner Mentors:

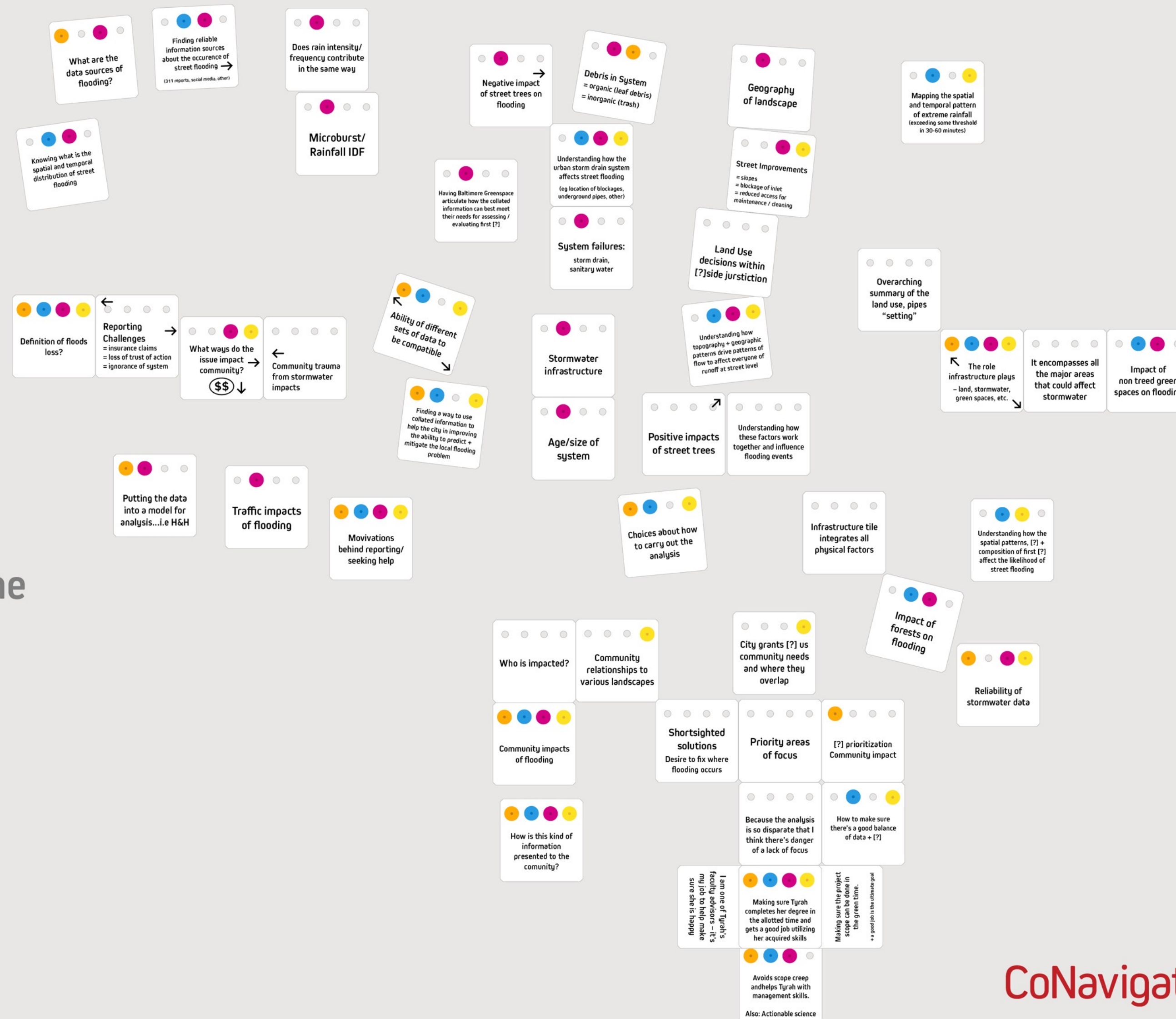
- Kim Grove (Baltimore City Public Works)

Stakeholder

- Katie Lautar (Baltimore Green Space)

# CoNavigator





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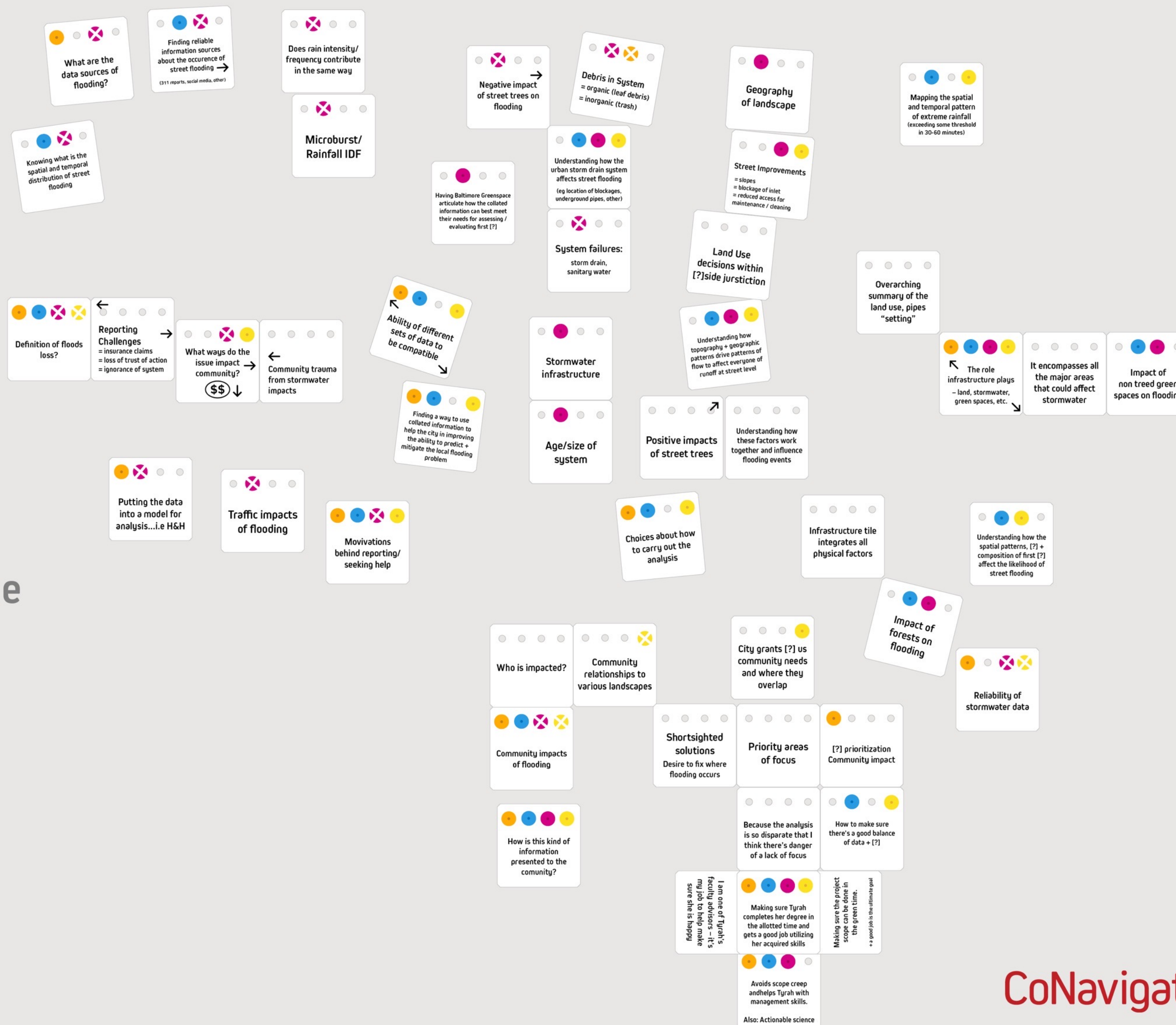
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● Matt Baker

Partner Mentors:

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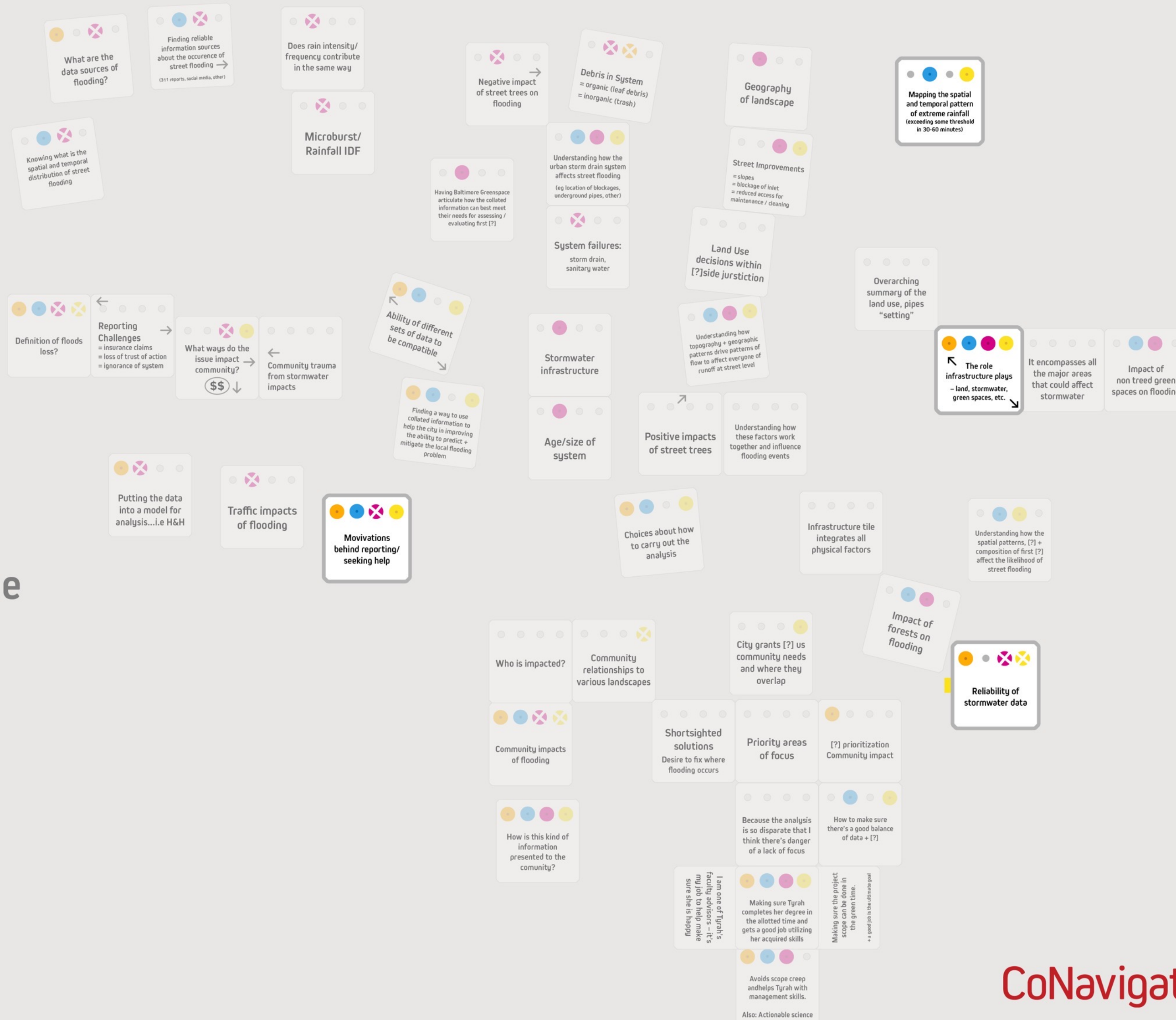
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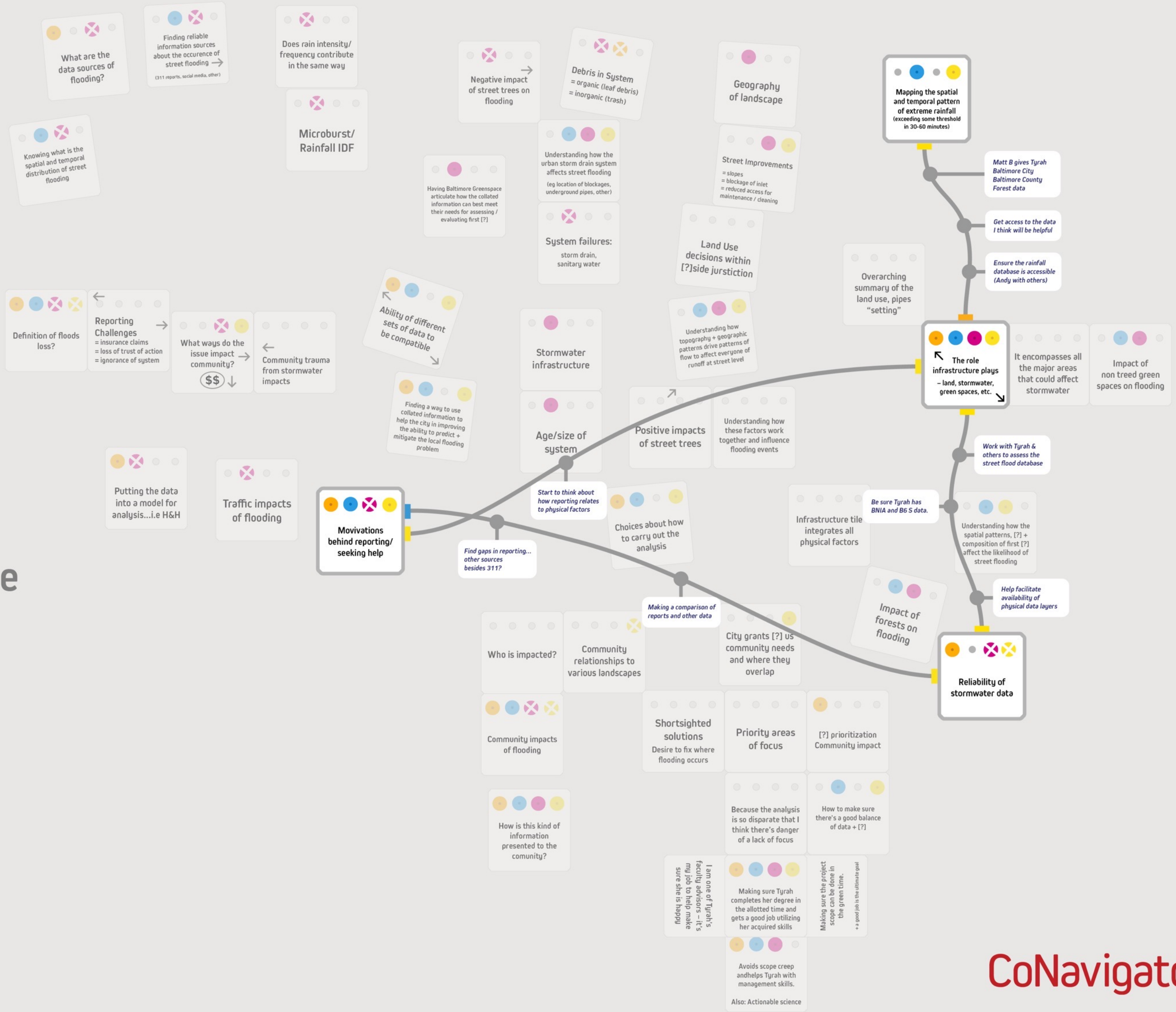
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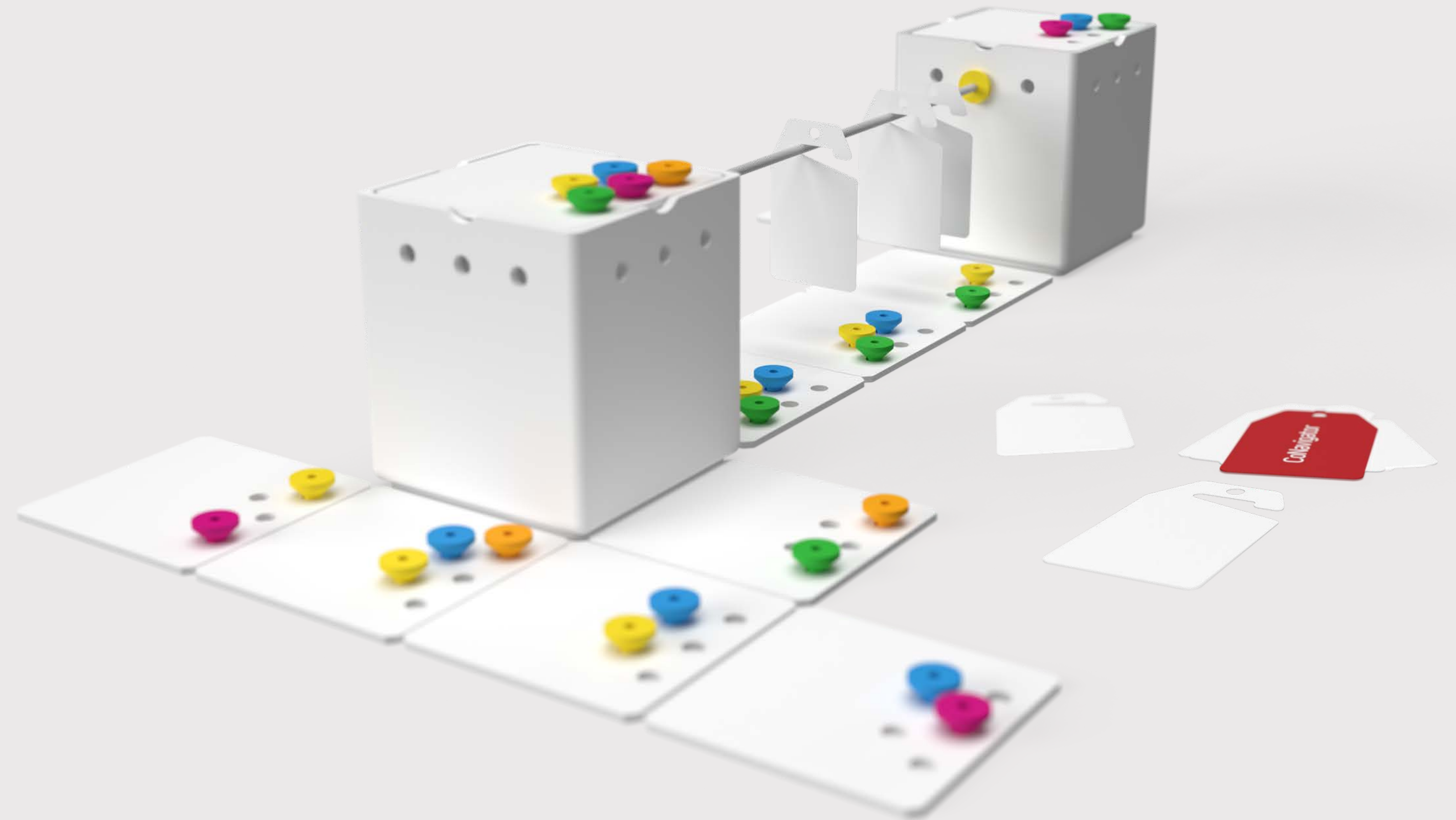
● Katie Lauter (Baltimore Green Space)



CoNavigator



# Physical design





# CoNavigator AR – create a virtual memory palace

(link to 2-minute YouTube video)



# CoNavigator AR – a virtual memory palace

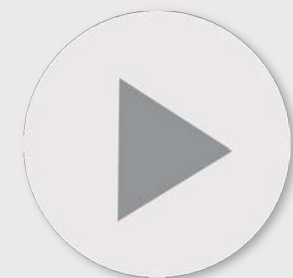
Revisit the process, add layers of information and context and explore the progression of the negotiated spaces.



Play audio recordings of presentation



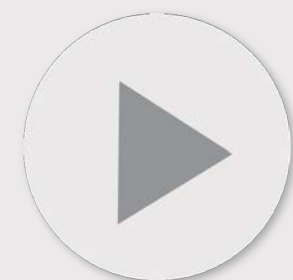
Add / Play slide shows & gallery images



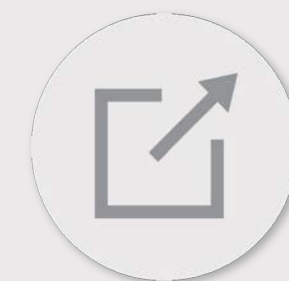
Replay the progression of steps



Share the AR topographies via link or QR code



Join up separate CoNavigator sessions into one



Link to external pages



Connect to a shared Google Doc



Link to a collaborative thread / channel on Slack



Join a Zoom call



Collaborate via Microsoft Teams





# Introduction session

Participants split into **pairs**.

**Interview** one another for 5 minutes each about one experience they have had with the theme. Each person then **presents** their partner's story to the group.



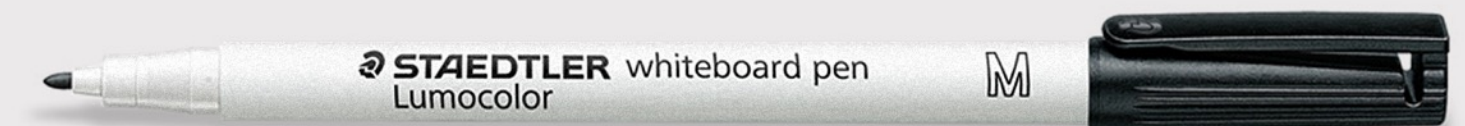
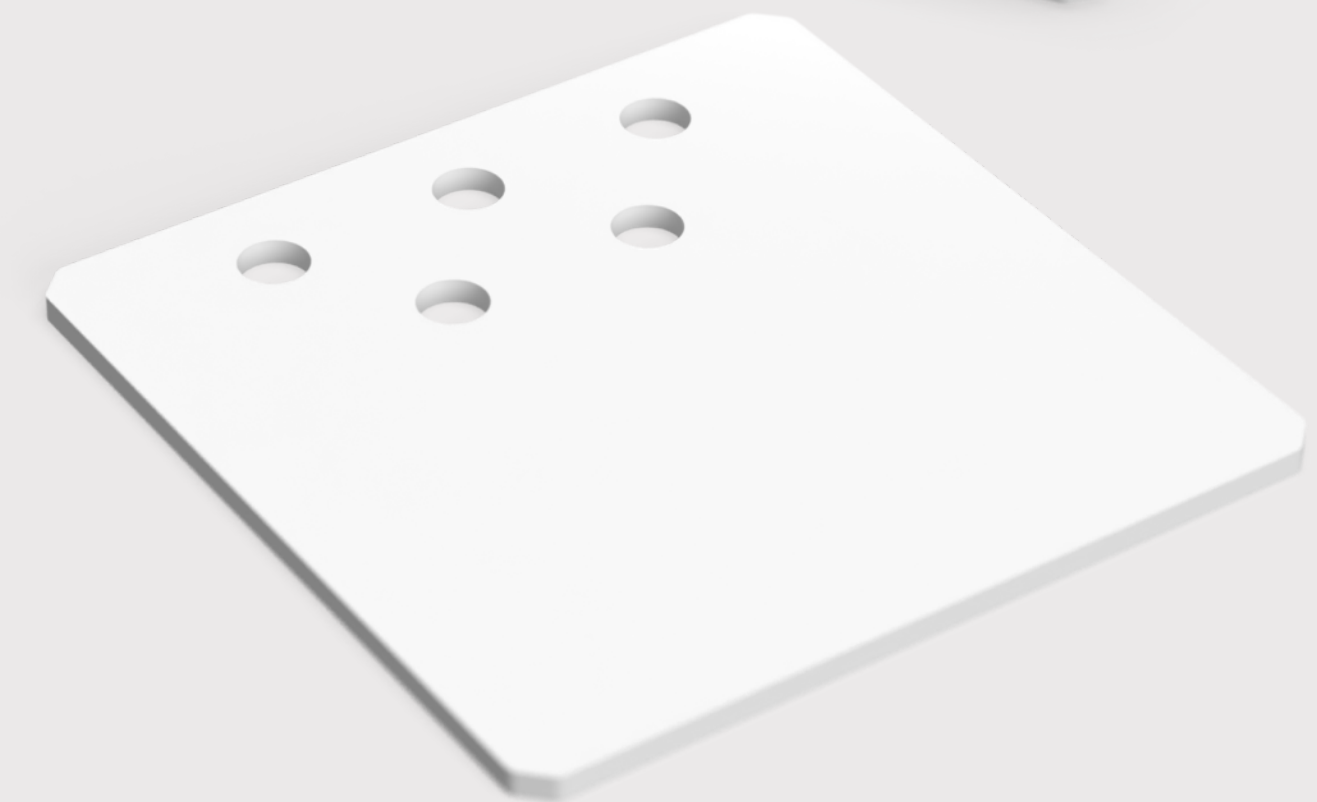




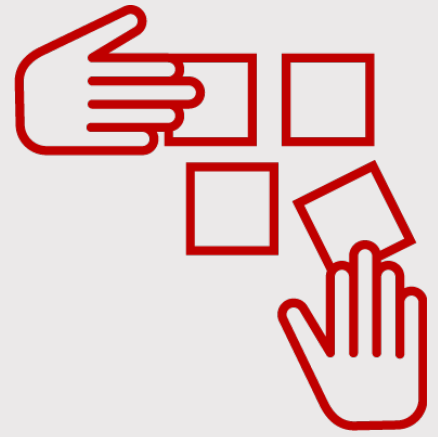
# Identify the theme

Using the **tiles** and **whiteboard markers**, write what you see as important or relevant to the theme.

**Draw** if you prefer.

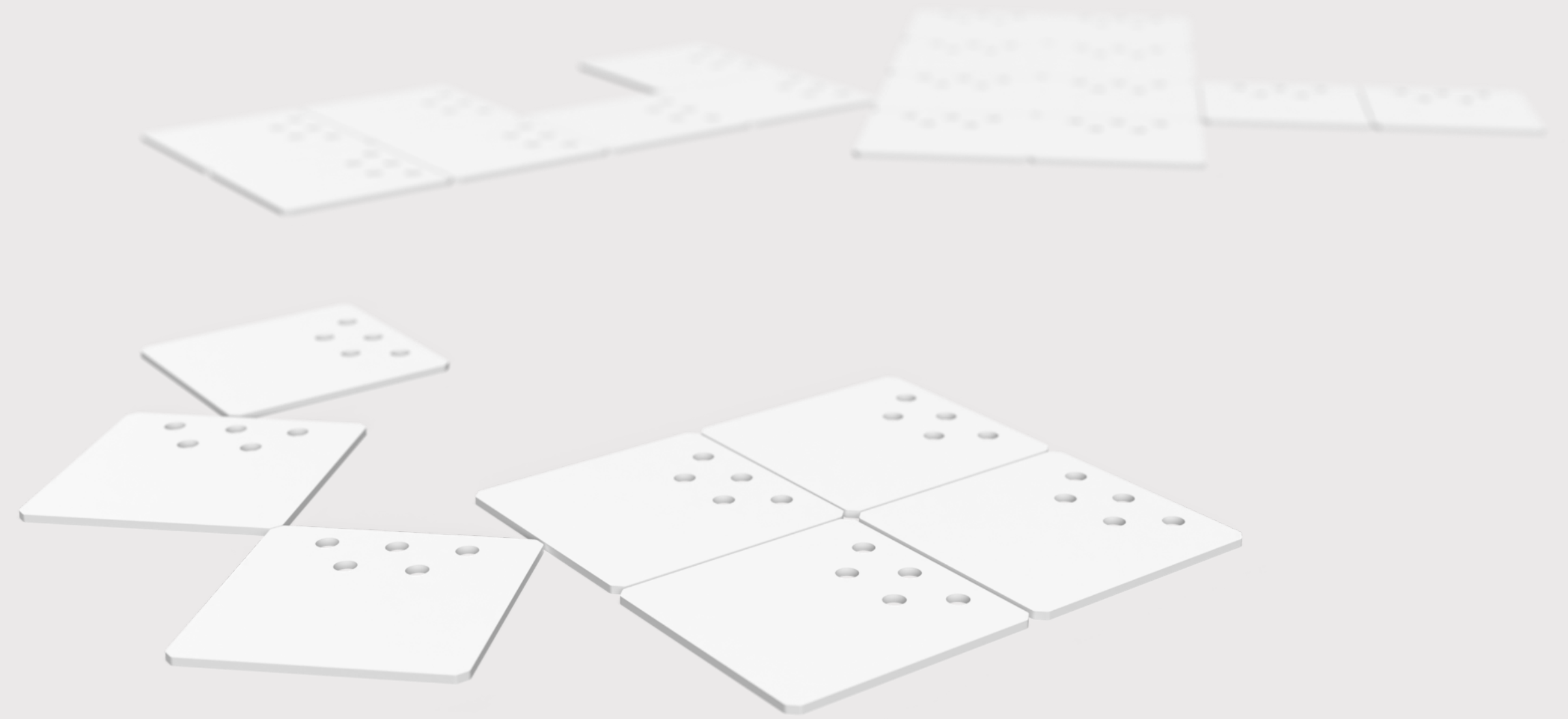






# Create a shared topography

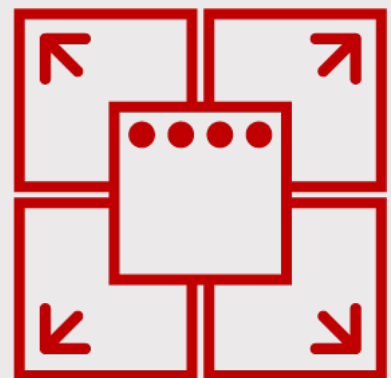
What would be the best way to organise a topography of your **combined** tiles? There can be as many **clusters** (or islands) as necessary. An island can be as few as one tile.





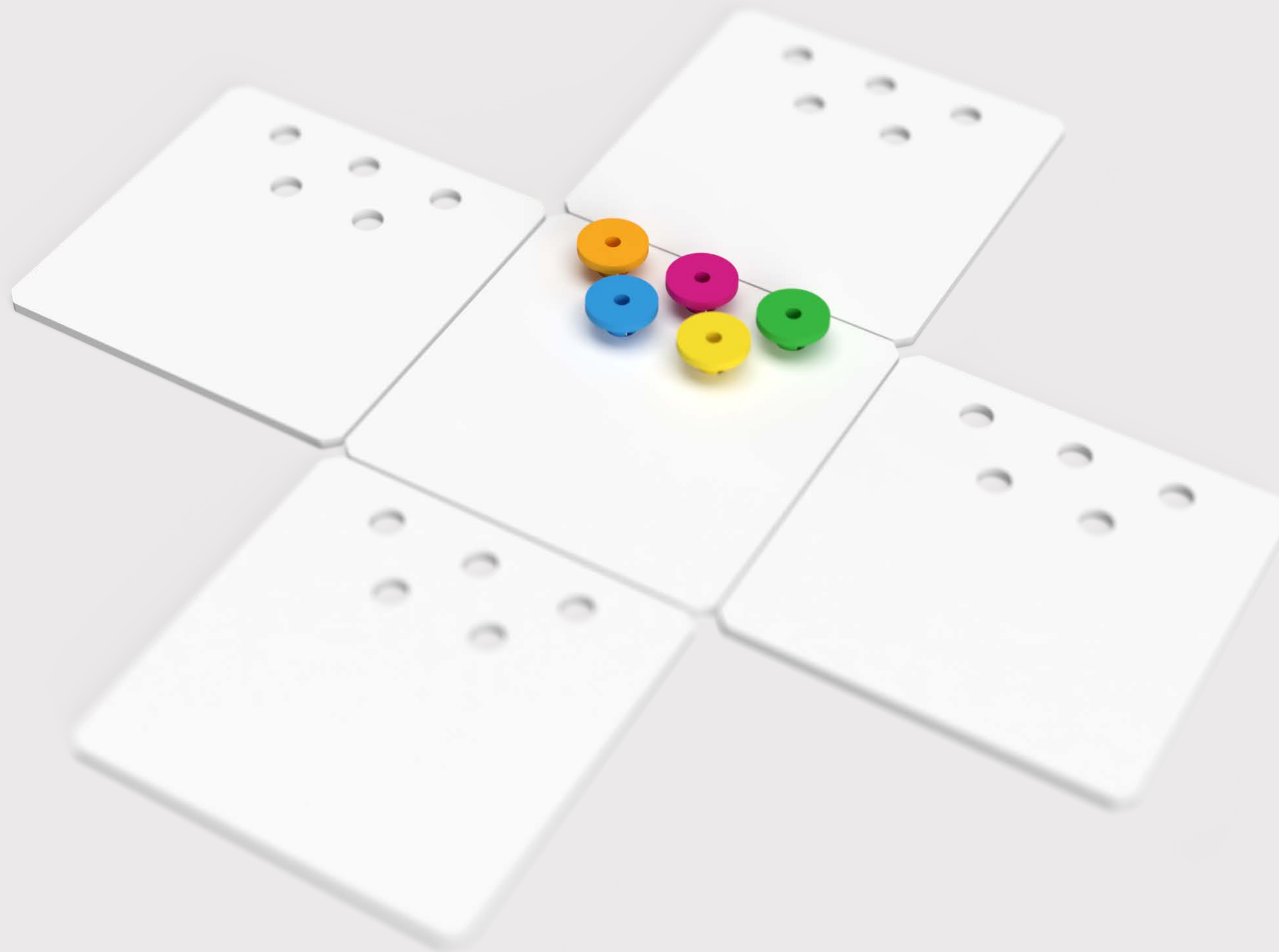




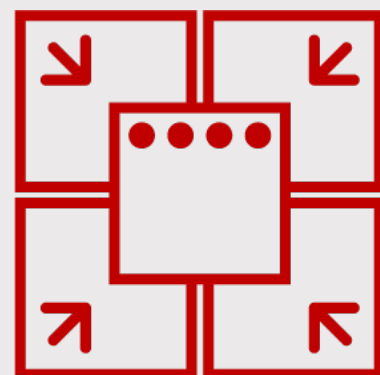


## Zoom in

Are there tiles with **4-5** pegs on them? Each person writes a **new tile** with an explanation of what makes this tile essential for you.

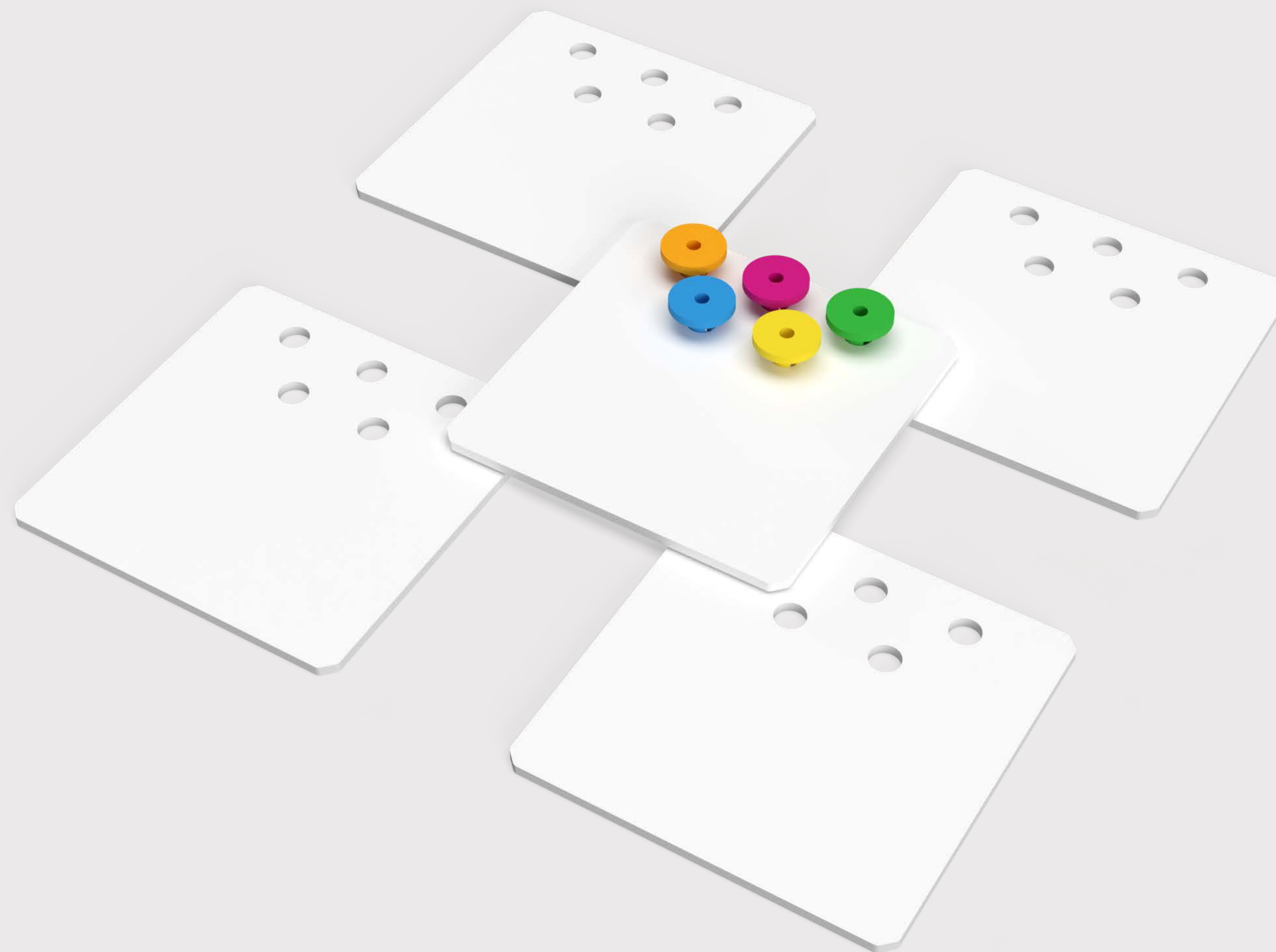






## Zoom out

Are there areas on the map which contain **few** **pegs**? Discuss why they were not flagged. Is there a **new** way of **organising** the areas to make them more essential? Or is there a new tile which better describes the cluster as a whole? Place it on top of the cluster. Take a **step back** once you are done.

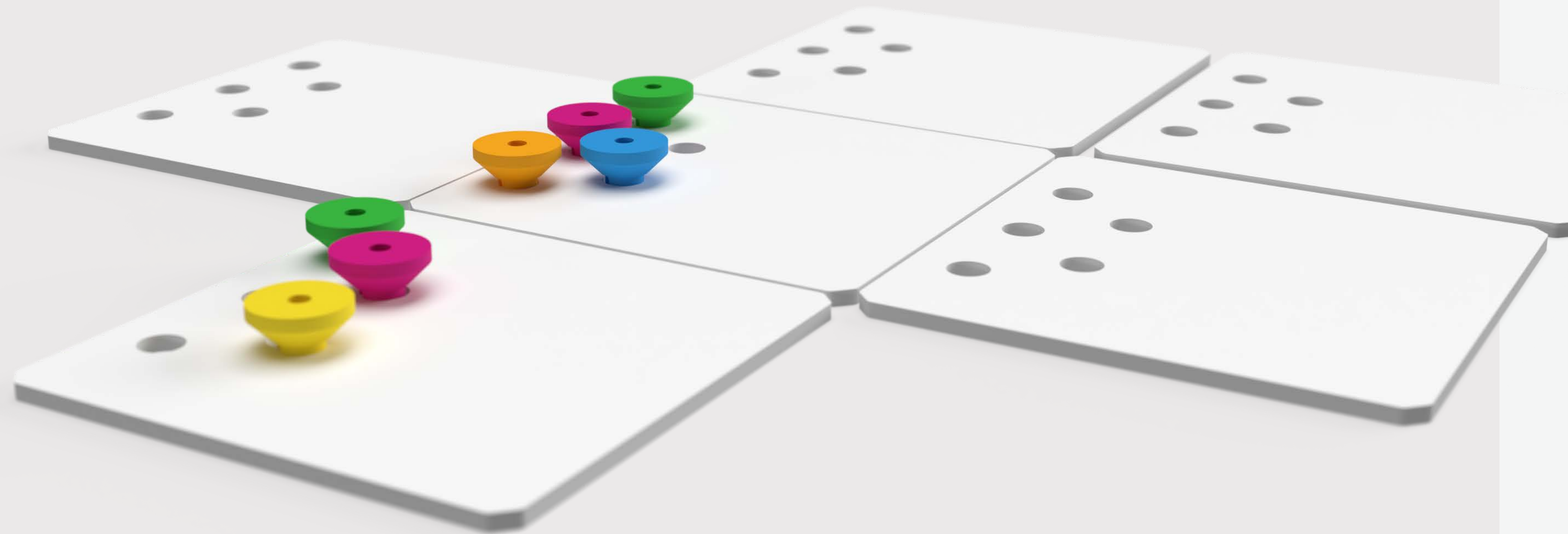






## Filter for agency

Look at the **coloured pegs** you have placed on the topography. Are there tiles over which you do **not** have any agency / expertise / influence? **Upturn** these pegs on the tiles.

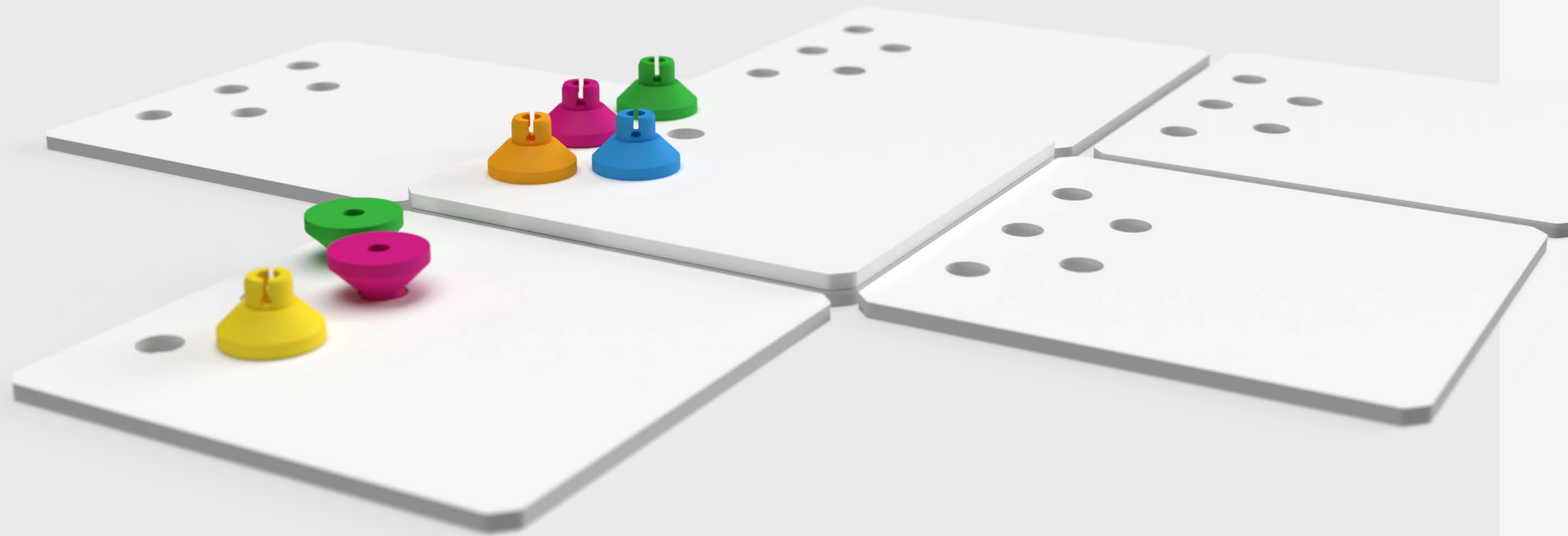




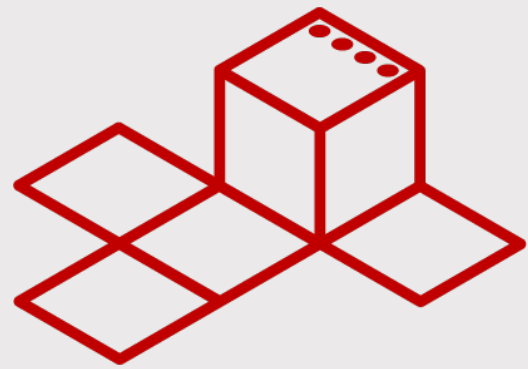


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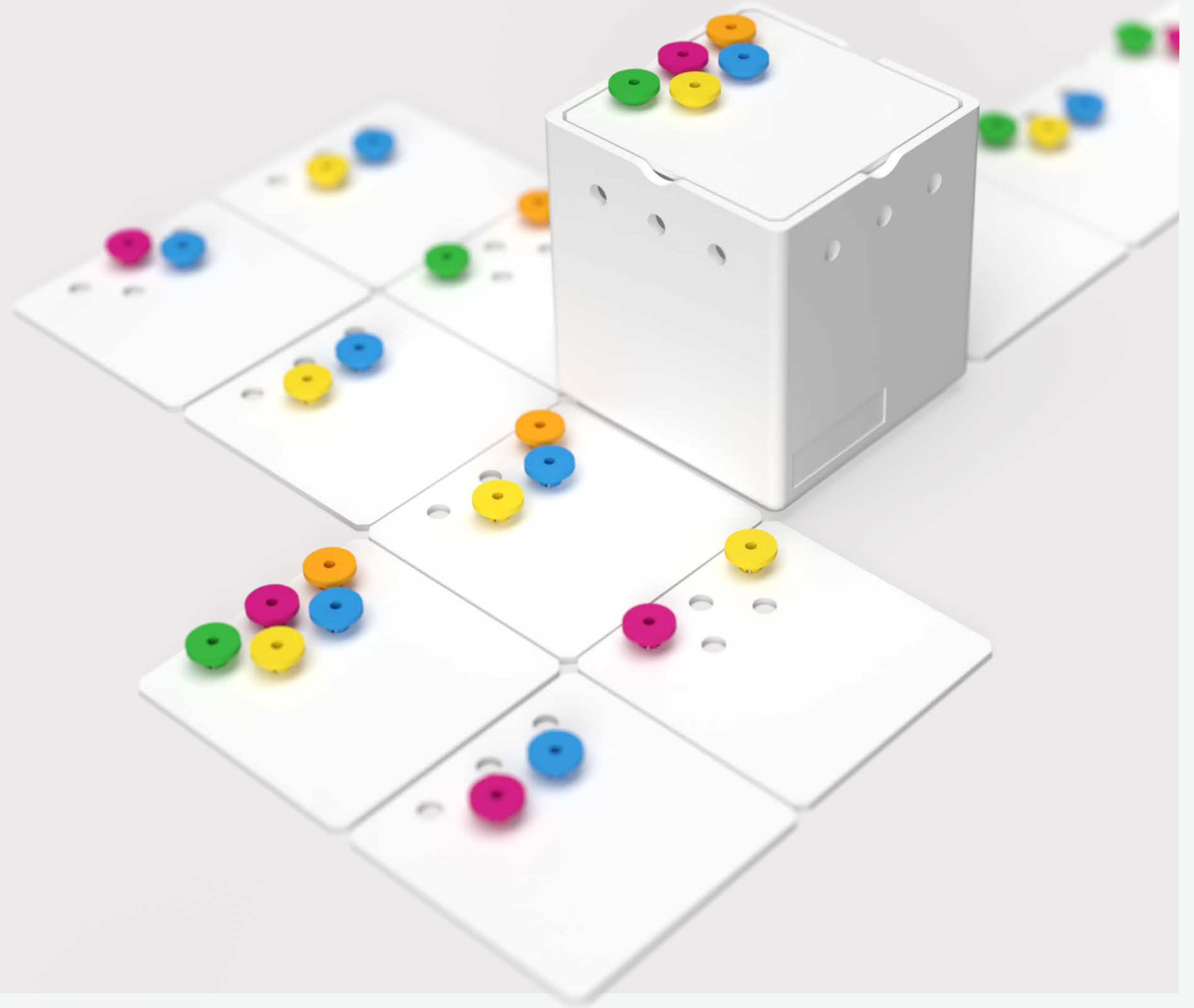




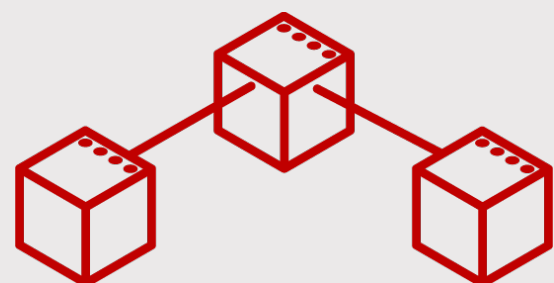
# Elevate the key areas

Look at the entire set of tiles. Each person decides which tile represents the area which needs most attention.

Elevate these 4 tiles using the cubes.

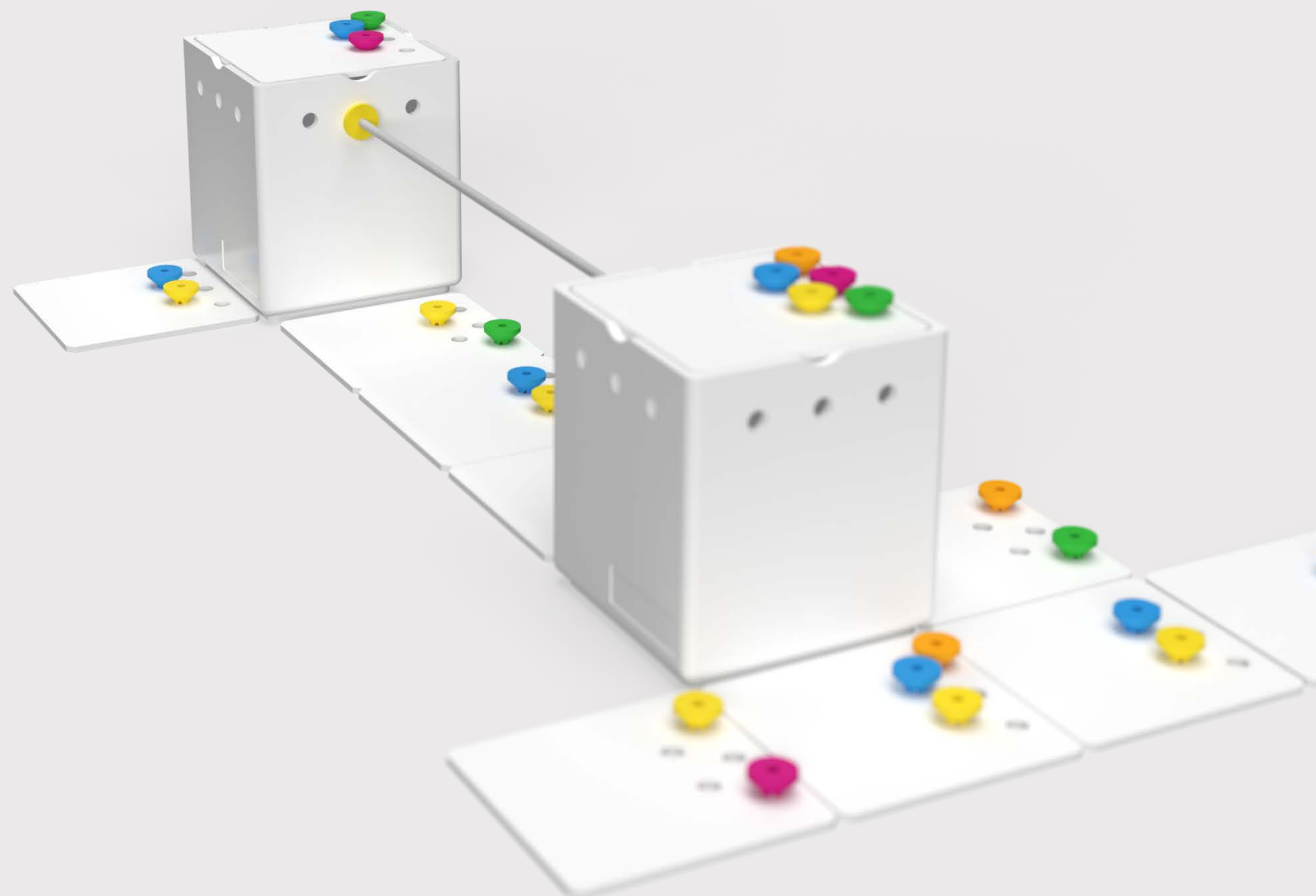




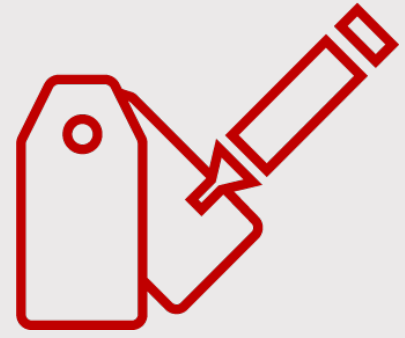


# Build routes

Look at the what the others have elevated and **listen** to why they elevated them. Can you see a connection between the areas they think are crucial, and your own? Think of ways of **connecting** these areas. Then discuss how these connections might be and **build a route** between the areas.

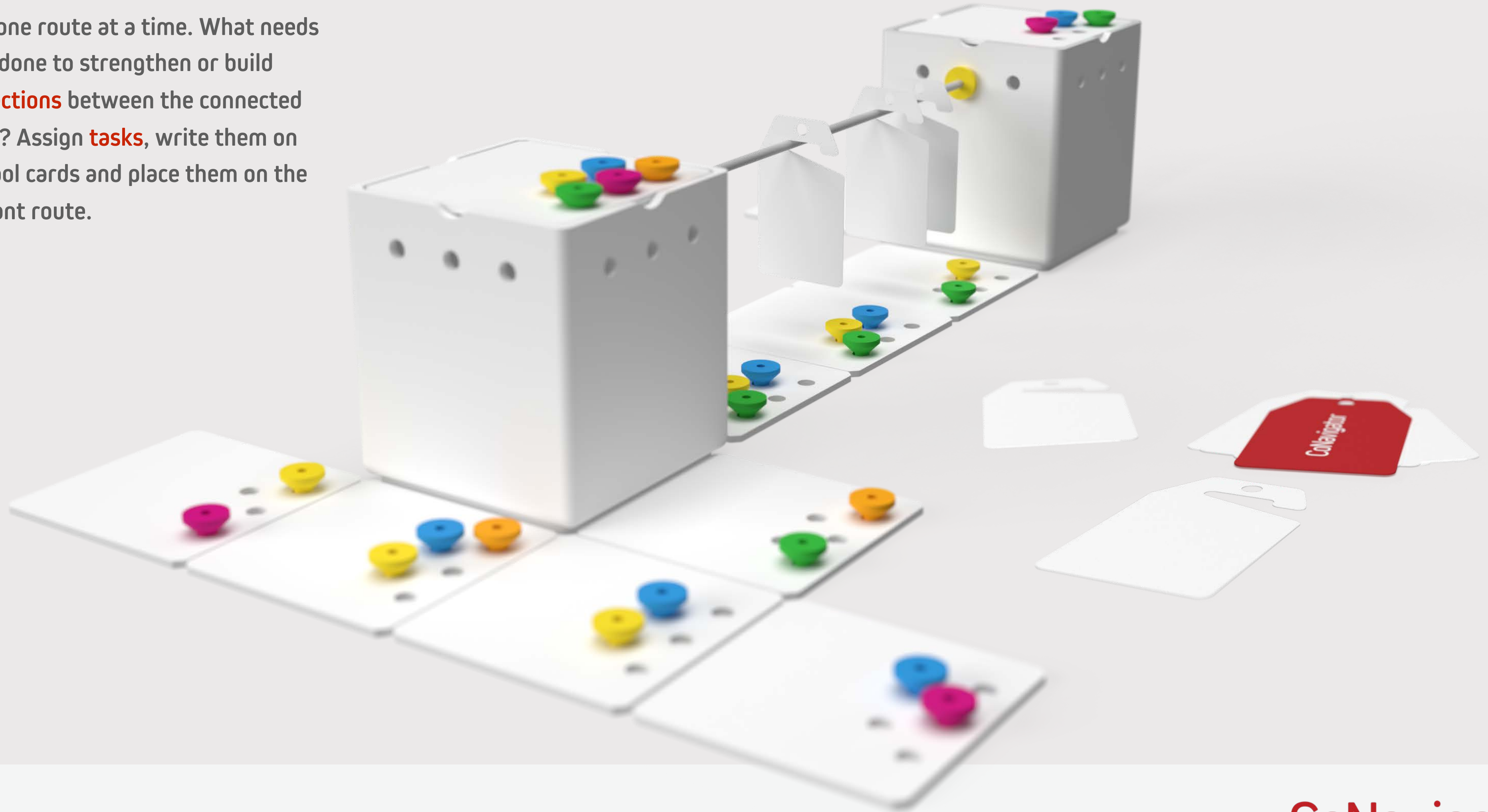




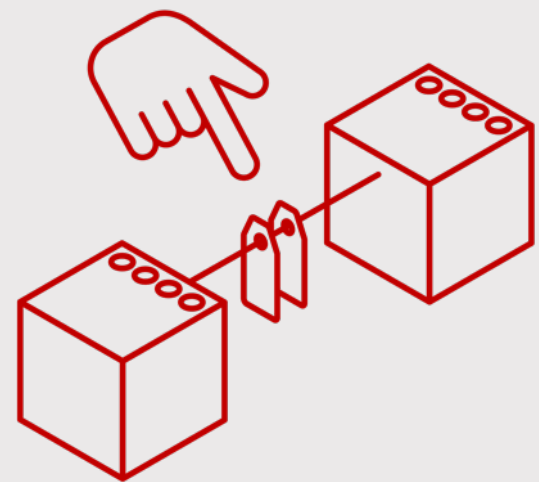


# Stakeholding

Take one route at a time. What needs to be done to strengthen or build **connections** between the connected cubes? Assign **tasks**, write them on the tool cards and place them on the relevant route.







# Present your CoNavigations

What was the **dominant narrative** in your collaboration?

Decide how to present the journeys that took you to this end point, what you learned and what were the outcomes.



NASA and NSF, Maryland, USA





## Barrier card

If there is some kind of hinderance to connections and collaborations, these can be signified by using a red barrier card (which divide the task cards).

Multiple colour coding could be developed for DFDS to match existing terminology/methods.

