CHEMICAL ATLAS
WORKSHOP REPORT

This report presents outcomes from the Chemical Atlas Workshop, held at University College London and facilitated by Andrew Barry, Olwenn Martin, and Lucy Sabin. Citation:

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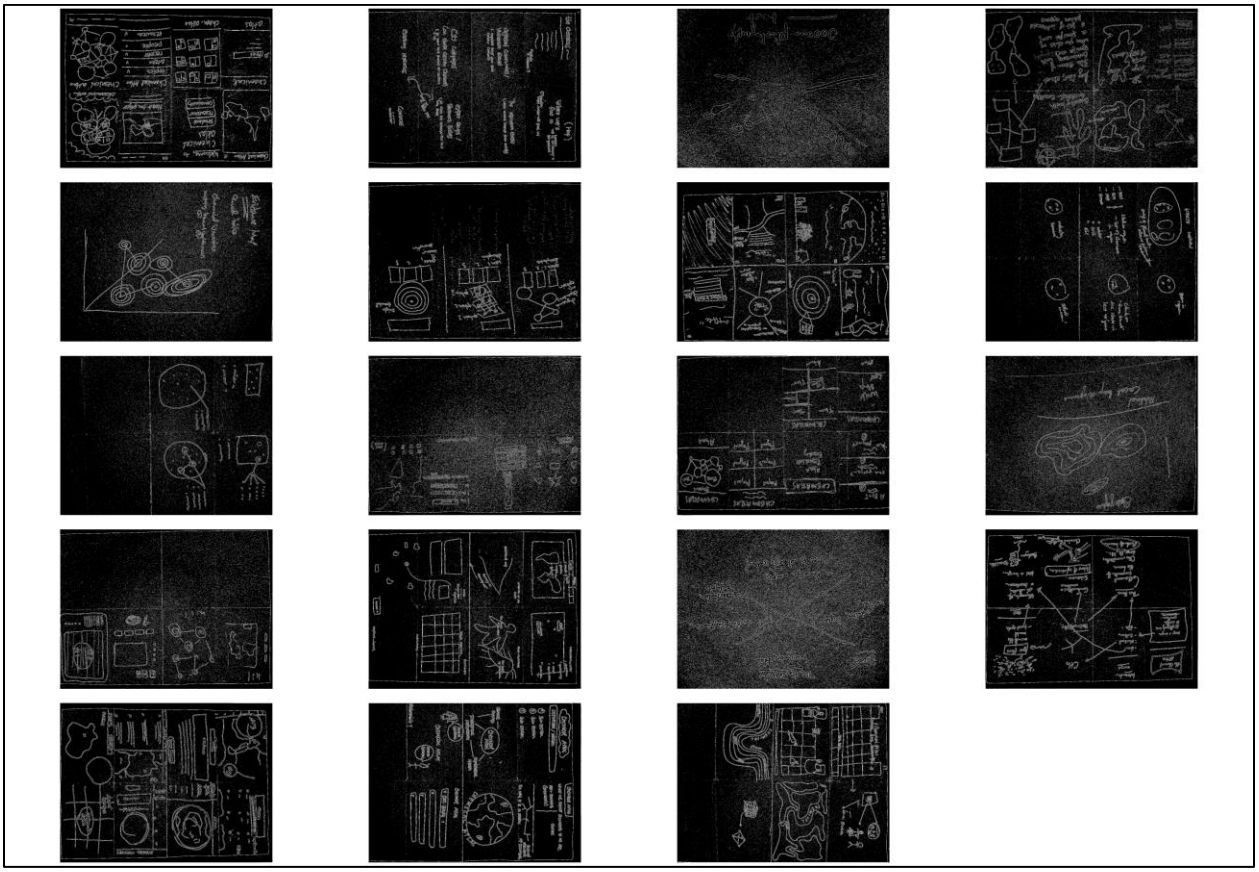

Figure 1. Archive of sketches / layouts by workshop participants.

Supported by UCL Grand Challenges

1. Brief Overview of the Workshop

This report summarizes ideas generated during an in-person workshop at University College London on June 6, 2025, led by Andrew Barry, Olwenn Martin and Lucy Sabin. The workshop, attended by 20 experts from the UK and internationally, facilitated knowledge exchange and ideation across disciplines, generating a community of practice and insights to inform the process of prototyping a “Chemical Atlas”.

2. About the Chemical Atlas

The Chemical Atlas is an ongoing, collaborative project that explores how chemicals shape life across bodies, environments, and regulatory systems. Initiated by a team of researchers at UCL working across science, geography, design, and anthropology, the project is developed in dialogue with a wider community of practitioners including artists, activists, educators, and journalists.

Together, we are developing a digital platform that brings together case studies, visual experiments, and critical mapping practices. Our aim is to prototype a new way of representing chemical exposure and circulation, one that reflects complexity and uncertainty rather than simplifying it. We treat chemicals not only as molecular or technical objects, but as social and political agents: present in landscapes, institutions, and daily life.

The atlas is being designed to work across multiple spatial and temporal scales, linking global infrastructures to specific sites of extraction, harm, or activism. It draws on counter-mapping, participatory methods, and design research to support more inclusive and situated forms of knowledge. Current work focuses on combining scientific data, personal testimony, and experimental visual formats into an adaptable, open-ended prototype.

The Chemical Atlas is not a finished product, but a space for collaborative inquiry, for testing methods, sharing perspectives, and reflecting on how we understand and navigate chemical conditions across spatiotemporal scales.

3. Who is it for? What does it do?

📊 Chemical Atlas User Personas: Key Trends Report

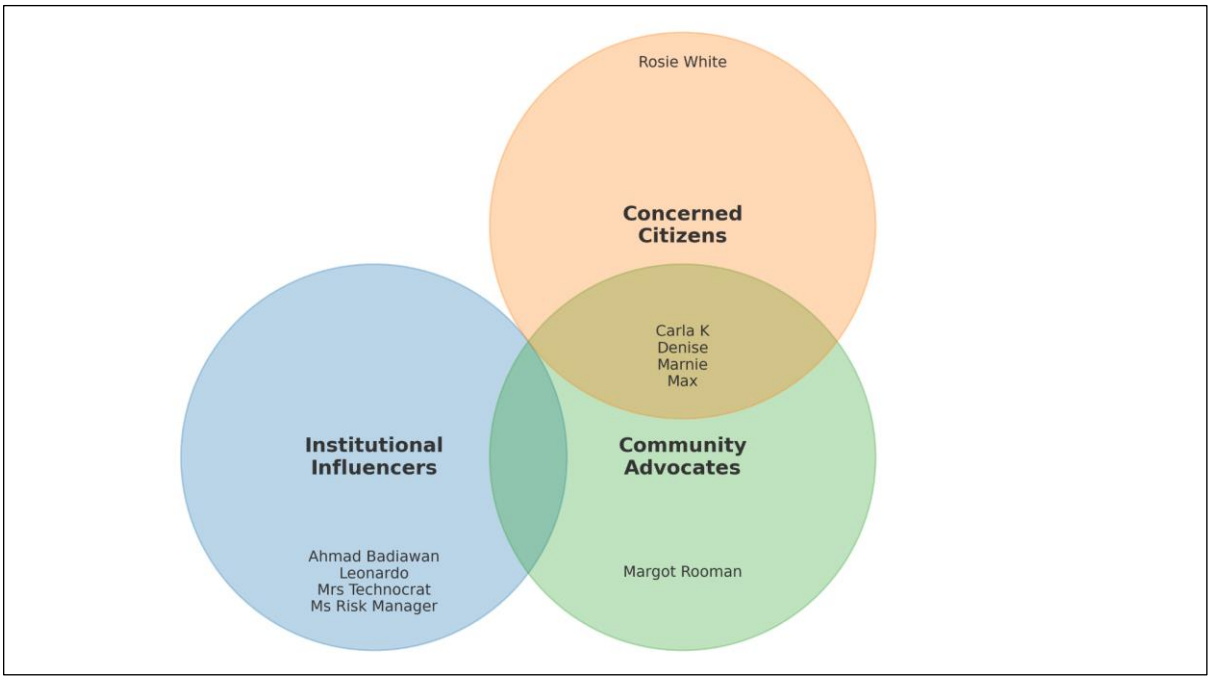

Figure 2. Venn diagram of user persona groups.

🎯 Overview

During the workshop, each member of the group created a “user persona” using a predefined template (Appendix A). While these personas were not based on empirical data about wider publics, they served as archetypes that revealed assumptions we held about potential users of the chemical atlas: who they are, their goals, etc. This process allowed us to identify commonly held ideas within the group (Figure 2) and develop a more targeted approach to defining the project scope. Twenty user personas were created and have been analyzed as follows.

👥 Roles and Backgrounds

The backgrounds among the user personas range from policy and environmental science to non-expert but civically active individuals. There is a mix of institutional (government, EU policymakers) and grassroots roles (parents, teachers, campaigners). Several user personas are described as community stakeholders and family members who are especially concerned about exposures to specific chemical pollutants in their local area.

🎯 Goals

- Raise awareness of pollution and chemical risks
- Educate and empower communities with credible data
- Shape policy through evidence and storytelling
- Educate others, especially younger generations and parents

⚠️ Challenges

- Lack of usable or localized data
- Overly technical platforms unsuitable for lay users
- Low institutional support or feeling ignored by authorities
- Isolation in civic efforts due to lack of expert backing

🌐 Website Needs

- Clear, zoomable geographic data with contextual explanations
- Visually simple and trustworthy information
- Tools for advocacy, like case studies and shareable content

🖥️ Technical Fluency

- Ranges from basic to intermediate
- Simple navigation and data visualization
- No need for technical training or background

🛠️ Preferred Tools/Platforms

- Websites and reports (professionals)
- Social media (Facebook, Instagram) (community actors)
- Platforms that support information sharing and public engagement

❤️‍🩹 Emotional Drivers

- Protecting children and community health
- Fear of long-term environmental degradation
- Desire (and hope) for empowerment and visibility in policy spaces
- Frustration with being excluded from expert discourse

🧩 User Group Overview

Personas were grouped into three overlapping user types based on role, technical fluency, and purpose:

- Institutional Influencers: Policy makers, regulators, and scientific advisors
  Example: Ahmad Badiawan, Leonardo
- Community Advocates: Local teachers, campaigners, and educators
  Example: Carla K, Margot Rooman
- Concerned Citizens: Motivated individuals without formal influence
  Example: Rosie White, Max

🔄 Overlapping Roles

Some personas, such as Carla K and Denise, bridge Community Advocate and Concerned Citizen, highlighting how roles are fluid and context-dependent.

3. Some Key Topics and Themes

📊 Insights from the Three Breakout Groups

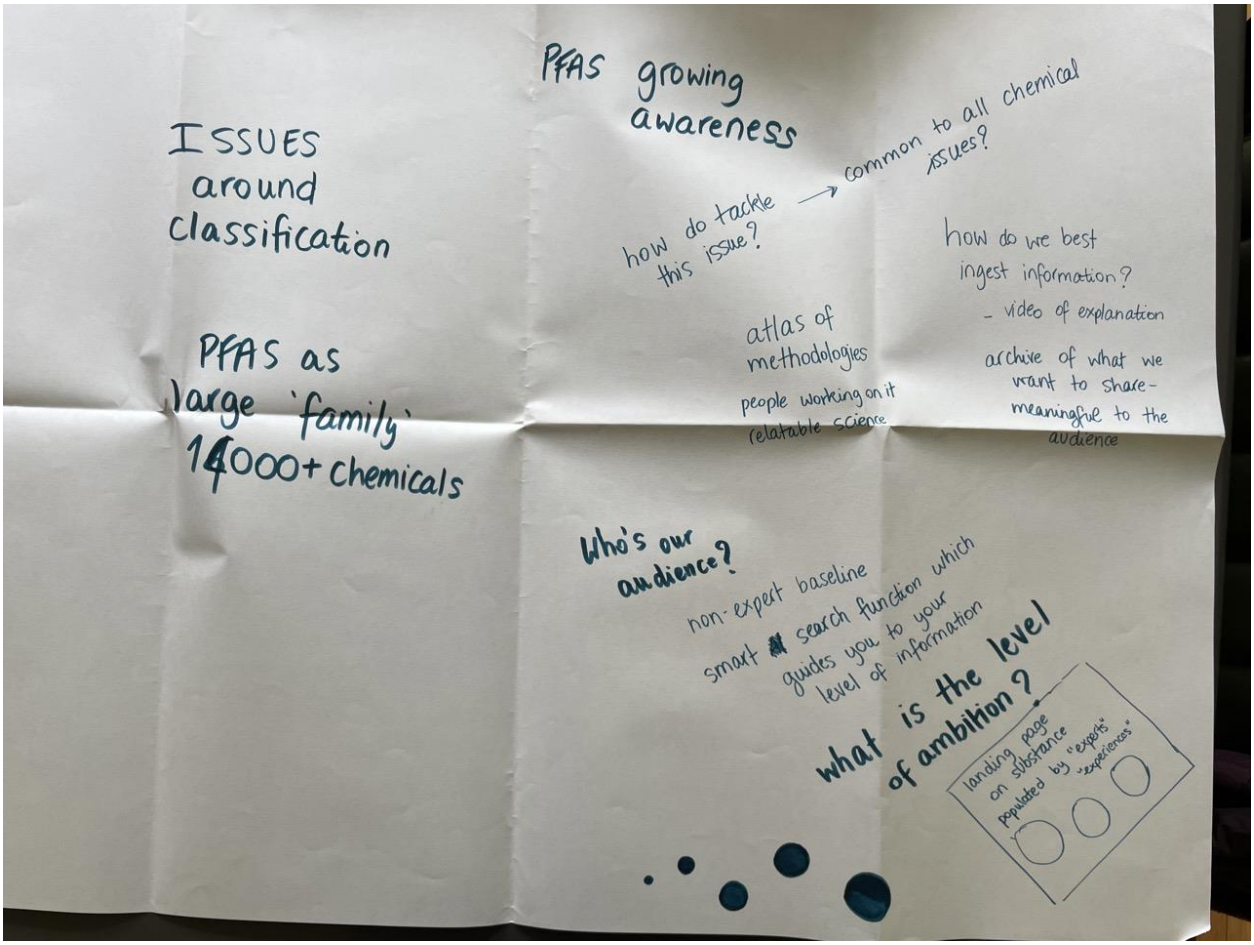

Figure 3. Notes and sketches by Breakout Group A.

Breakout Group A: PFAS, Persistence, Accumulation

🔑 Key Themes

The group explored PFAS (per- and polyfluoroalkyl substances) as a hyperobject, a class of over 14,000 compounds that are highly persistent, widely distributed, and difficult to fully comprehend or contain. Their ubiquity and complexity make them particularly challenging to address both scientifically and publicly. This raised key concerns around communication: how do we meaningfully convey the risks of substances that are invisible, long-term, and uncertain in their effects? The group emphasized the regulatory inconsistency and classification challenges that further complicate public understanding and policy response.

Central to the discussion was the need to improve how we communicate uncertainty, not just the presence of harm, but its ambiguity and systemic entrenchment. The atlas, they argued, should not only present facts but help users grasp the nature of chemical uncertainty itself.

🧰 Proposed Functions for the Atlas

Rather than focusing solely on substances, the group proposed an "Atlas of Methodologies" as a tool that visualizes how chemicals are studied, classified, and regulated, revealing the often-invisible infrastructures of governance and science. Navigation should be audience-centric, offering layered tools for everyone from experts to the general public.

A flexible, scalable interface was key: one that allows users to zoom from a distant overview of global PFAS patterns, into detailed project level narratives, and even to personal or community impacts. This multiscale design would make abstract risk more tangible and help bridge scales of experience, from the molecular to the political.

🧭 Design Implications

The group recommended designing the atlas as a scaffold for understanding: a framework that helps users navigate the messy terrain of chemical knowledge, not just a container for datasets. Classification systems should be made visible and explorable, revealing how knowledge is organized, debated, and regulated. Entry points should be layered: by health effects, by geography, by legal status. Most importantly, the design must support search and exploration by uncertainty (Figure 4), helping users understand not just what we know, but what remains unresolved.

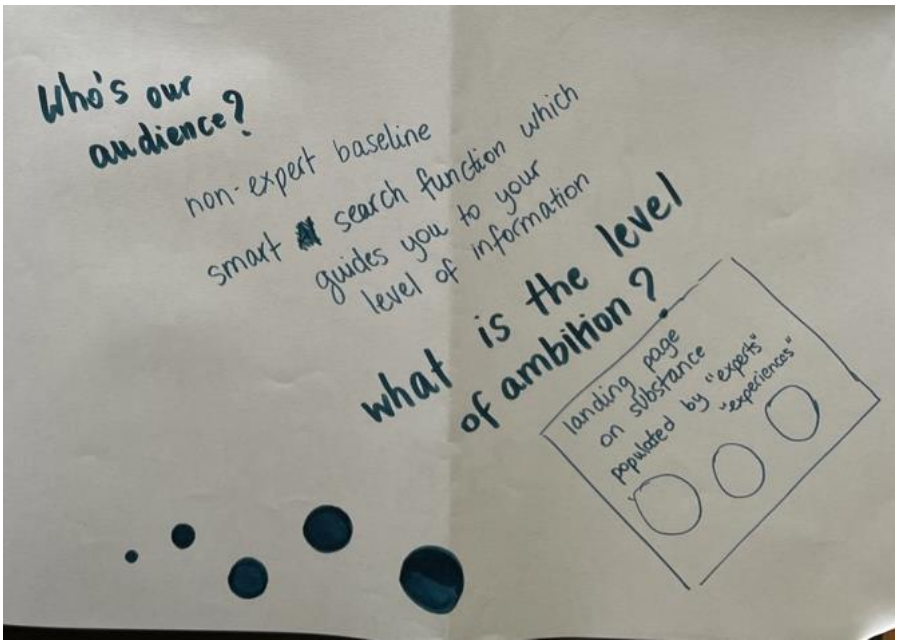

Figure 4. Notes and sketches by Breakout Group A – zoomed in.

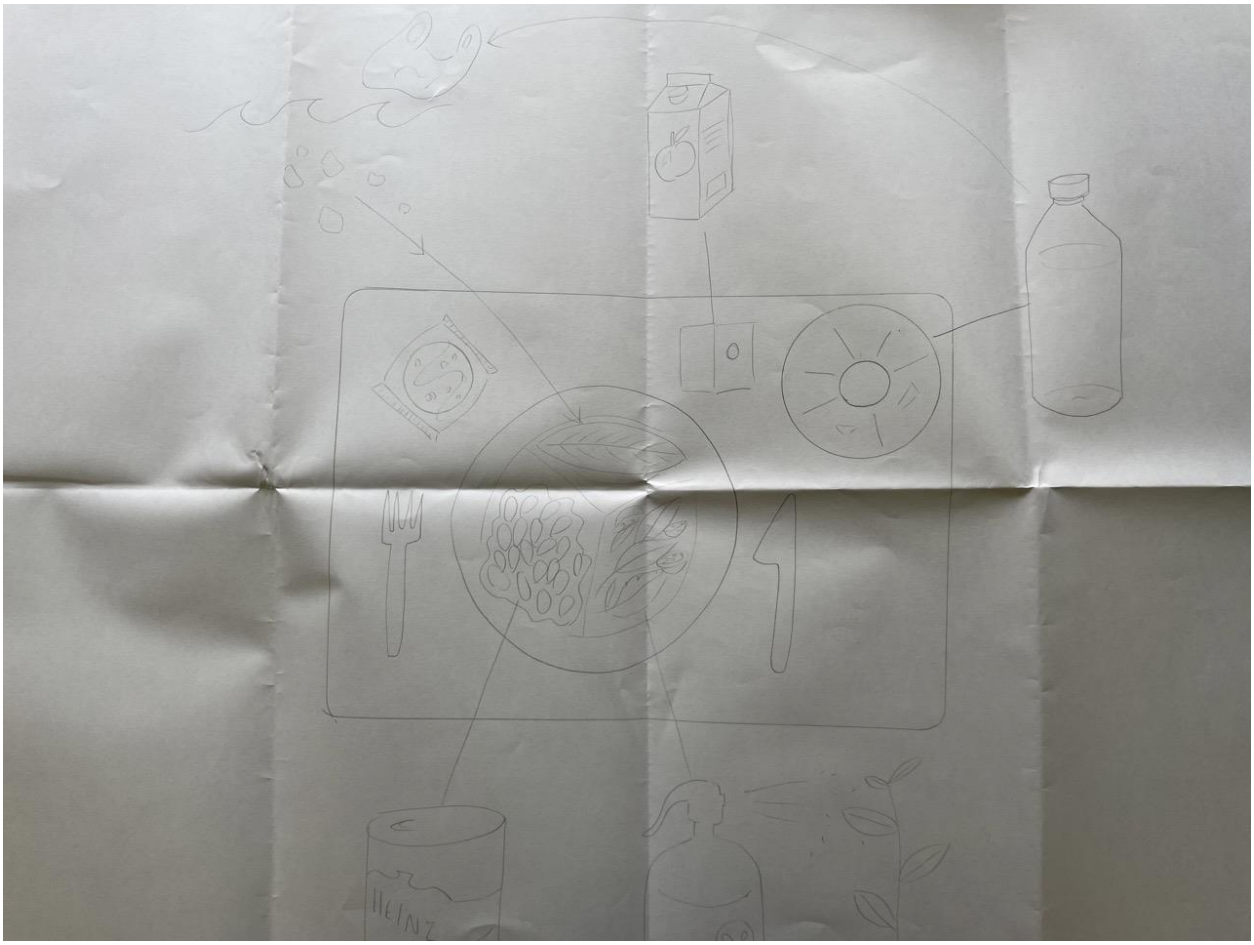

Figure 5. Sketch of school lunch with clickable labels revealing chemical residues by Breakout Group B.

Breakout Group B: Plastics, Endocrine Disruption, Reproductive Justice

🔑 Key Themes

The group focused on crafting atlases that actively engage a wide range of users – schools, journalists, communities, and researchers – recognizing that different audiences require tailored narrative and visual strategies. A strong interest emerged in interactive storytelling, particularly formats like "choose your own adventure" that enable users to explore content based on their role, decisions, or perspective.

The use of playfulness – such as an interactive chemical lunch tray (Figure 5) – was proposed as a way to make complex chemical systems more relatable and memorable. Emotional framing was also key: the group emphasized narratives that evoke curiosity, anxiety, and responsibility, moving beyond data to provoke moral reflection.

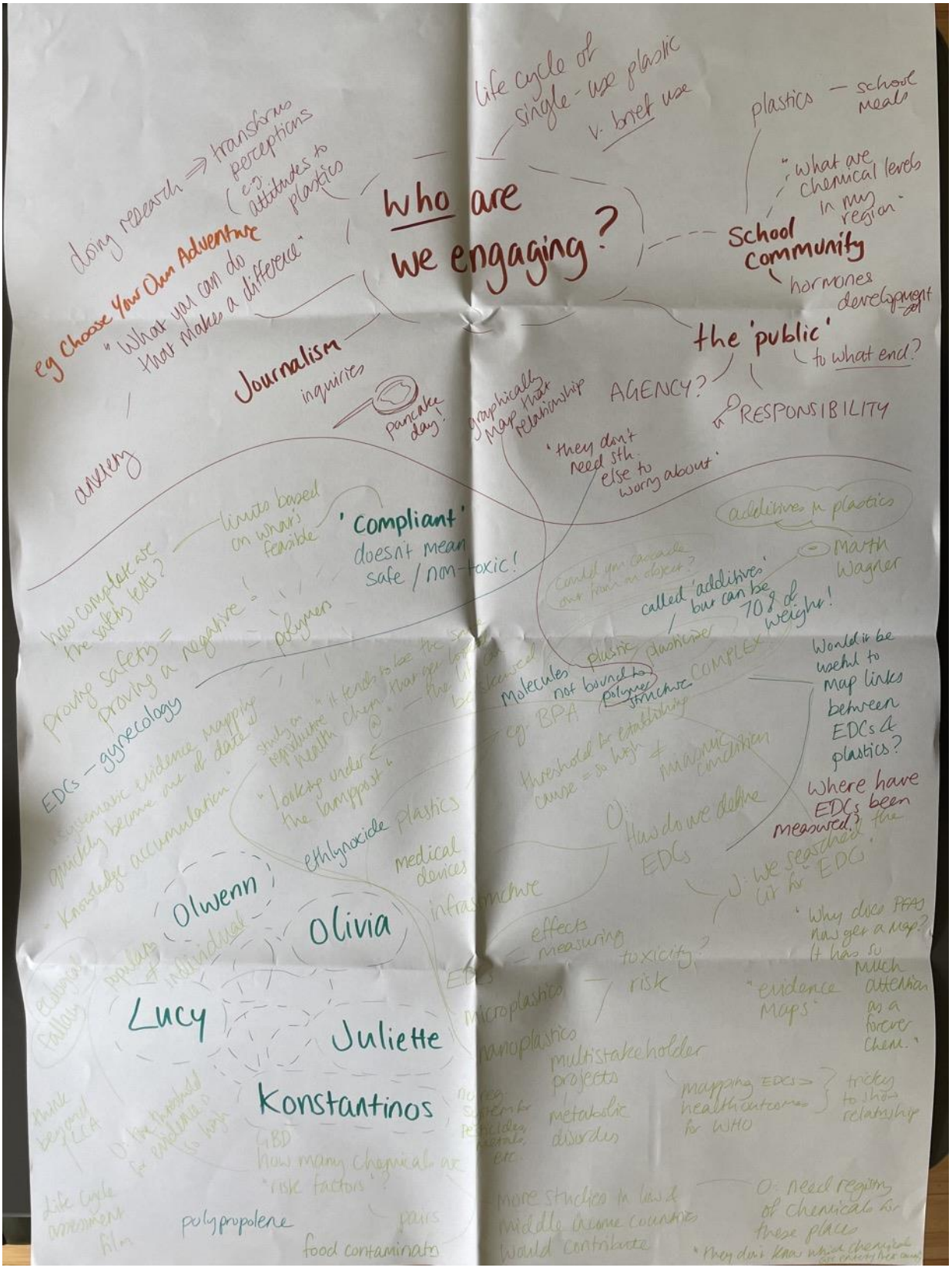

Figure 6. Mind map by Group B.

Participants examined the chemical lifecycle of plastics, not just as a linear process, but as a series of transformations, from production to disposal and re-emergence in "safe" or "compliant" forms (Figure 6). This raised important questions of agency: Who is responsible for managing these cycles? What stages and actors are made visible, and which are hidden from public view?

👥 Collaborative Network

The group discussed the importance of representing both personal and institutional actors within the atlas. Rather than a singular voice, the proposed model recognizes contributors –such as educators, researchers, or regulators – as nodes in a distributed network. This approach encourages transparency and shared authorship, crediting individuals and institutions by their role or function in the lifecycle.

🧭 Design Implications

The atlas should support emotionally resonant storytelling, inviting readers to connect with the material not only intellectually but personally. Narrative branching, allowing users to follow paths based on profession, exposure, or interest, can offer diverse ways of entering the story. The group also emphasized the need to visualize regulatory ambiguity, especially where terms like "safety" are contested or unclear. Finally, the design should allow multi-perspective navigation, so that users can explore the same chemical lifecycle through the lens of a teacher, a journalist, a policymaker, or a concerned citizen.

Breakout Group C: Mining, Colonialism, Critical Minerals

🔑 Key Themes

The group emphasized the importance of designing for transdisciplinary audiences, recognizing that effective atlases must speak to scientists, policymakers, artists, and community members alike. They highlighted the value of integrating diverse knowledge sources –scientific data alongside artistic interpretations, historical records, and lived experience. A strong geopolitical framing emerged as central, especially in tracing the global supply chains of critical minerals – from sites of extraction like China to decision-making hubs such as Geneva (Figure 7). Visually, participants imagined narrative structures that map flows: from mines to manufactured products and ultimately to waste. These would layer extractive histories with present-day data using tools like geochemical maps, archival material, and personal vignettes.

🧠 Conceptual Highlights

The group explored the concept of “Atlas + Coloniality”, reflecting on how the very act of mapping can either challenge or reinforce colonial narratives, especially in the context of resource extraction. A flow-based visual logic was proposed, where the emphasis is on movement, transformation, and circulation, rather than static borders or territories. This led to deeper questions about the atlas form itself: Why choose an atlas? What possibilities does it open, and what constraints does it impose?

🧭 Design Implications

Designing a critical minerals atlas would require entries that combine multiple forms of knowledge (scientific, historical, visual, narrative, etc.). The flow of materials should shape the structure of the content, guiding users through a narrative of transformation. Visual elements should highlight global power structures, including trade routes, political influence, and economic asymmetries. Finally, the group recommended developing map forms that reflect movement, acknowledging the shifting geographies and temporalities of extraction and circulation.

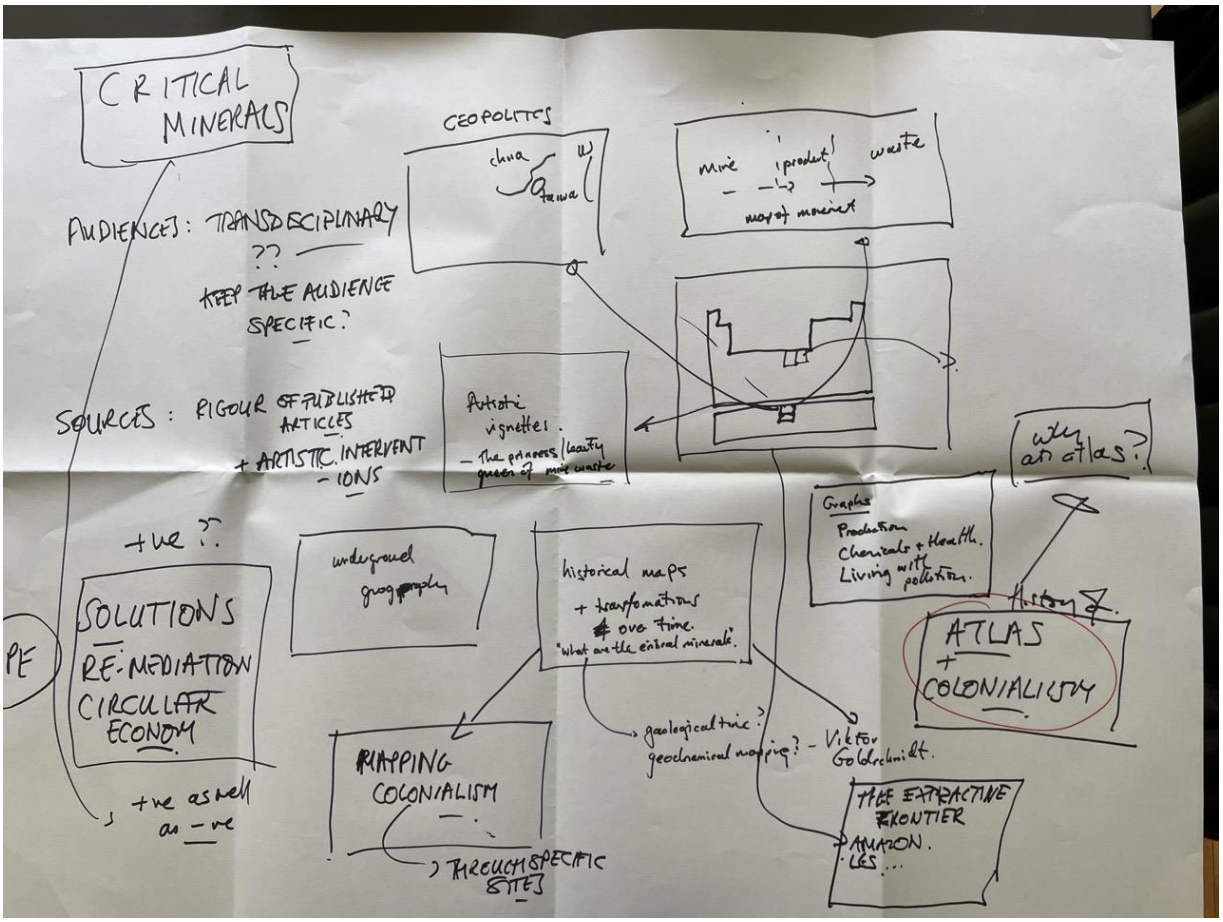

Figure 7. Notes and sketches by Group C.

4. Developing a Visual Language

This section synthesizes core visual motifs and conceptual models drawn from 20 hand-drawn wireframes and sketches (e.g., Figure 8) produced by workshop participants in a “rapid prototyping” session using the "crazy eights” method (Figure 9). These patterns offer a foundation for translating research themes (chemical interconnections, toxic geographies, embodied impacts) into interactive, visual, and navigational forms for the digital platform.

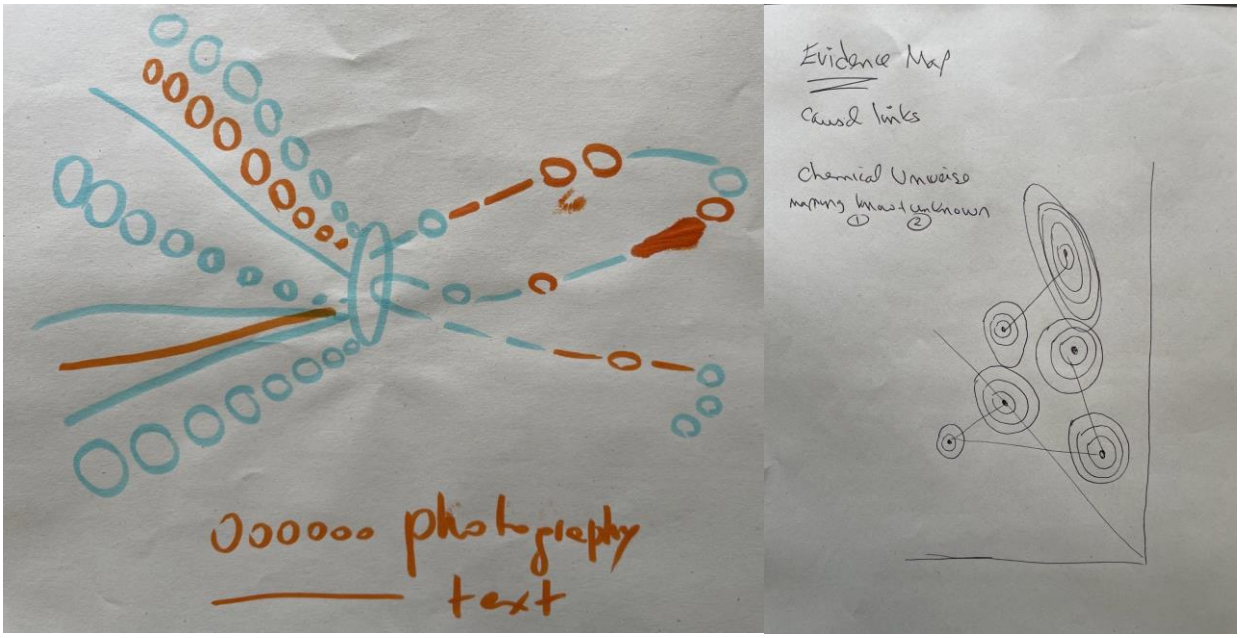

Figure 8. Example sketches from the workshop.

Recurring Visual Forms

🚀 Network Diagrams

- Nodes + lines: circular or molecular nodes connected via radial or webbed lines.
- Interpretation: suggests relationships between chemicals, locations, and people.
- Common uses: index views, case study maps, home page visualisers.

🪐 Globes + Circular Maps

- Multiple sketches feature globes or amorphous maps with embedded points.
- Interpretation: signals scale (planetary) and place-based stories.
- Common uses: landing page visuals, thematic overviews.

🧭 Contours + Topographies

- Layered contour lines used to evoke depth, terrain, or non-linear navigation.
- Interconnected issues or multiscale complexity (e.g. bodily ↔ planetary).
- Common uses: Issue overviews, filters, relational mapping.

🧪 Grids + Tables

- Chemical table grids: periodic table formats to structure chemicals or themes.
- Evokes scientific taxonomies while inviting reclassification.
- Common uses: navigation by chemical, story archive, or template entry.

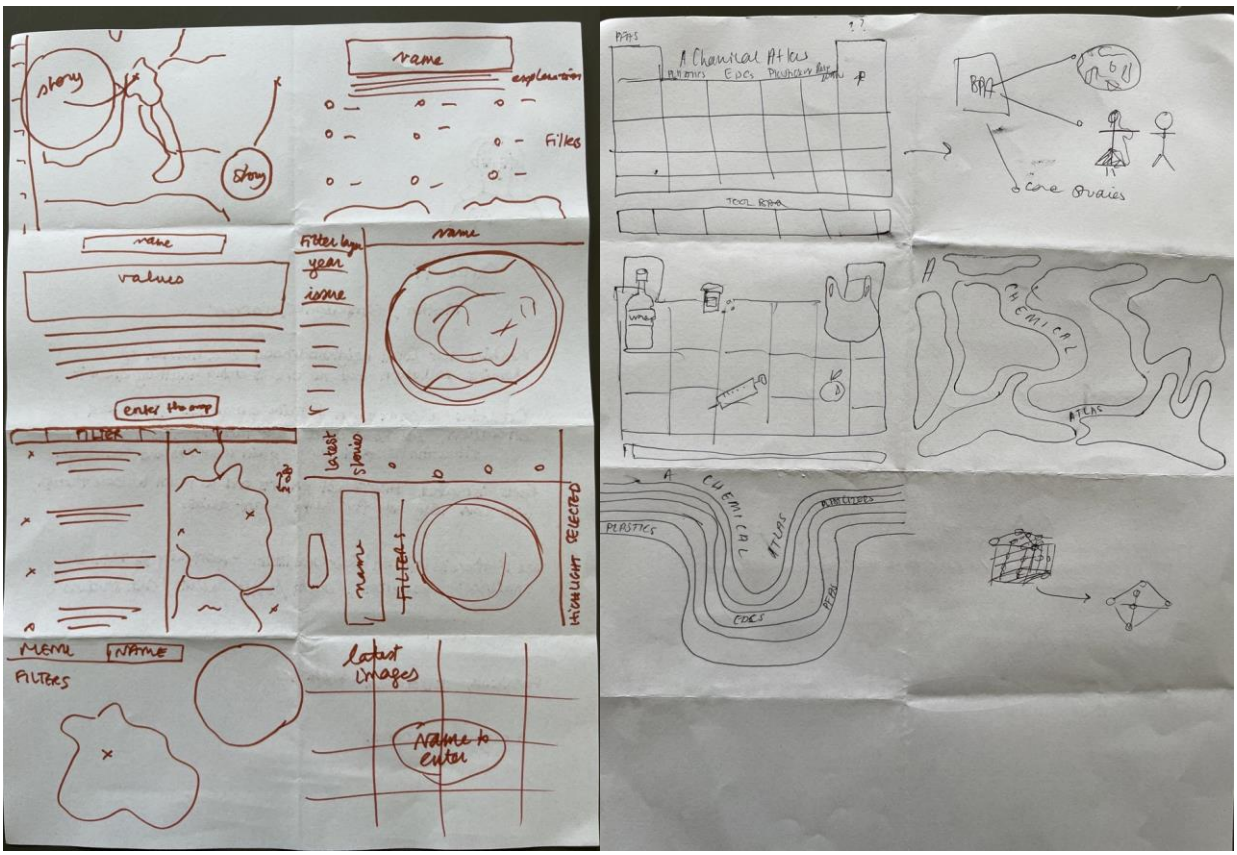

Figure 9. Rapid prototyping using the “crazy eights” technique (8 ideas in 8 minutes).

Conceptual Frameworks

🔁 Interconnectedness

- Chemicals ↔ Bodies ↔ Geographies. The sketched layouts frequently represent hybrid relations (human–nonhuman, industrial–biological).
- This implies that the design could support moving between or across scales and entities: molecule → body → territory → policy.
- How could the atlas itself act as an “interscalar vehicle”? (Hecht 2018).

🌐 Mapping the Invisible

- Data layers: invisible phenomena (toxicity, exposure, molecular processes) are visualized using dots, bubbles, and gradients.
- Implications: interface should surface unseen impacts (e.g. hormone disruption, latency).

🕯️ Embodiment and Testimony

- Figures and personal experiences: people are drawn as carriers of chemical exposure, as narrative anchors, or as sensing subjects.
- It is important to include testimonial story formats and emphasize voice/subjectivity.

🧭 Non-linear Navigation

- Fluid maps and multimodal paths evoke complexity. Many shapes and layouts reject a strict hierarchy or chronology but suggest a degree of contingency.
- Design Insight: enable browsing by chemical, place, concern, or story simultaneously.

Interface Ideas (for example)

Element	Suggested Format	Rationale
Home visualizer	3D molecular network (draggable)	Central metaphor; flexible entry point
Story index	Contour map or dynamic web	Emphasizes connections over fixed lists
About/methods	Grid ↔ network toggle	Transparency of approach and methods
Story detail	Layered visual-text layout	Longform + relational graphics
Filter/Explore	Sidebar with map, chemical, themes	Navigable by user concern or curiosity

Table 1. Elements of the websites and suggested formats based on visual analyses.

Conclusion: Design Principles (to be continued)

In conclusion, the visual approach should prioritize relational, not reductive representations – allowing forms to suggest connections and flows rather than fixed categories. Visuals should strive for aesthetic coherence, using linear, gestural, and organic elements that echo the conceptual themes of entanglement, transformation, and uncertainty. A truly effective atlas must also be multi-scalar, enabling users to navigate seamlessly between molecular details and global patterns. Finally, the design should remain participatory, with space for users to contribute their own stories, testimonies, and data... ensuring the atlas evolves as a shared, living resource.

Work Cited

Hecht, G. (2018). “Interscalar vehicles for an African Anthropocene: On waste, temporality, and violence.” *Cultural Anthropology 33* (1): 109–141. https://doi.org/10.14506/ca33.1.05.

Appendix A

Chemical Atlas: User Persona Template

[Photo / Avatar]

Name:

Affiliation / Role:

Discipline / Background:

Primary Goals:

Challenges / Frustrations:

Use Cases / Website Needs:

Technical Fluency (■ Basic ■ Intermediate ■ Advanced):

Preferred Tools / Platforms:

Quote (Optional):