



UNIVERSITÀ
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Green Europe:
Active Citizenship
and the Environment

 Jean Monnet
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GrACE

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Active Citizenship
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Bringing Systems Thinking into the Classroom

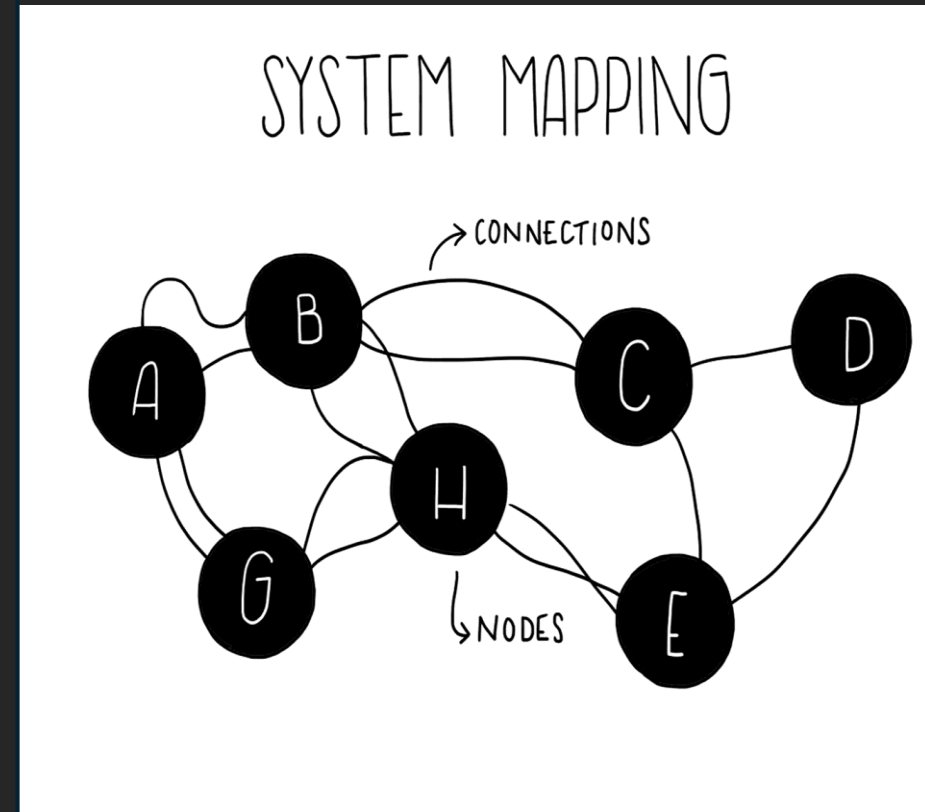
Colin Sage Raul Pinto

Thinking in Systems

- Polycrisis: complex & rapidly evolving situations require holistic, integrated approach that avoids reductionist “cause and effect”.
- We must embrace ambiguity, eccentricity, non-linearity, unexpected outcomes, emergence, cascading effects, diffusion, adaptation.
- Replaces arrogance of solutionism; humility for what we don't know.
- Allows us to explore complexity but in a more provisional, iterative way.
- The structure of a system (inc feedback loops) determines its behaviour.
- Lines between nodes may represent flows of information, finance, power, people; flows can amplify or dampen behaviour in nodes.
- Our system is nested within a larger system: look up! It's context.

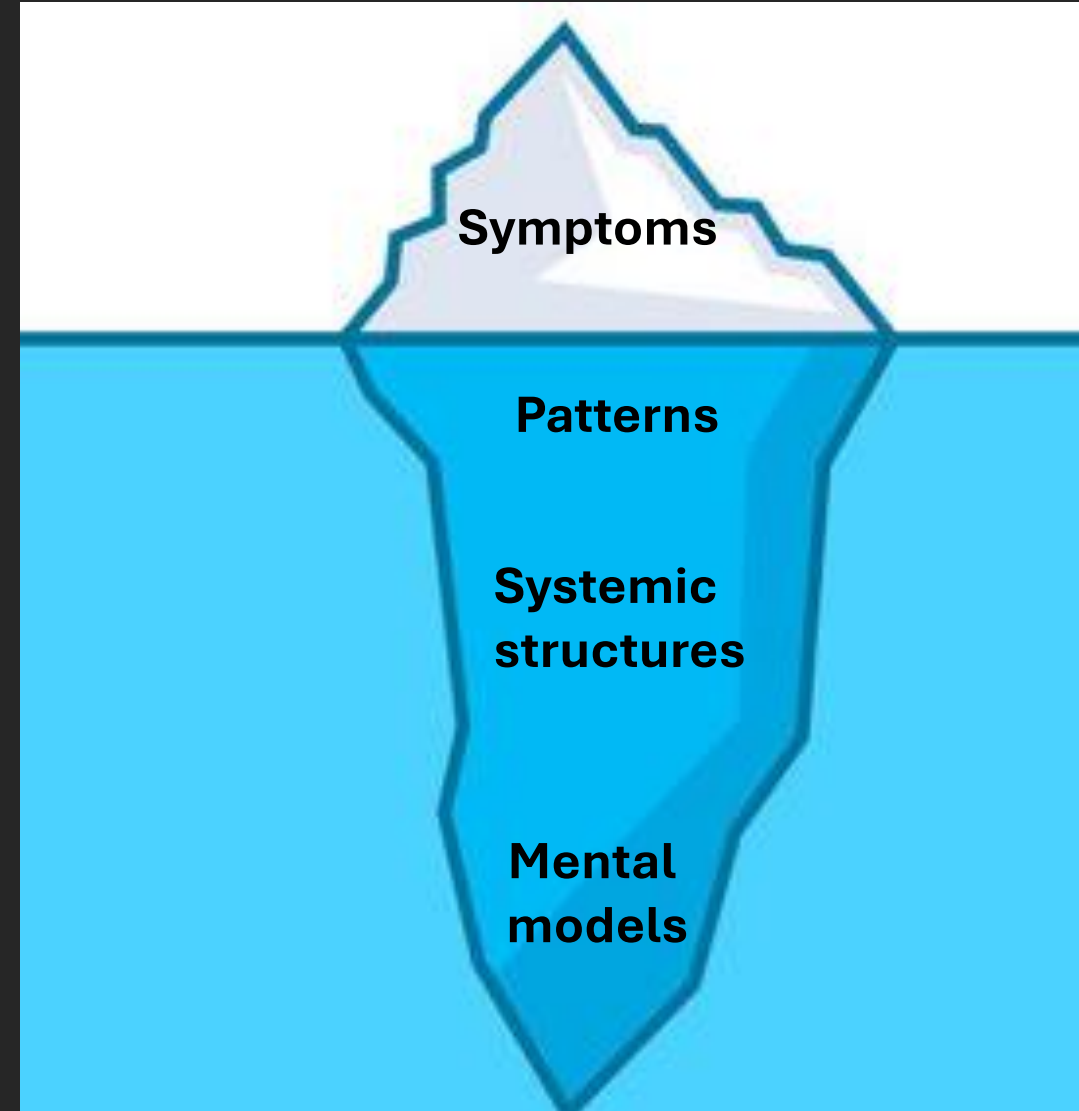
Systems mapping

- To better understand how a system works it is 'mapped', enabling better visualization of connections in systems
- Helps people see their own role within the system; also enables a shared understanding of different perspectives
- Helps to identify possible points of intervention & actions that may change the way the system functions to produce better outcomes
- A systems approach reveals relationships with components in interrelated systems, like energy, water, health and the environment.



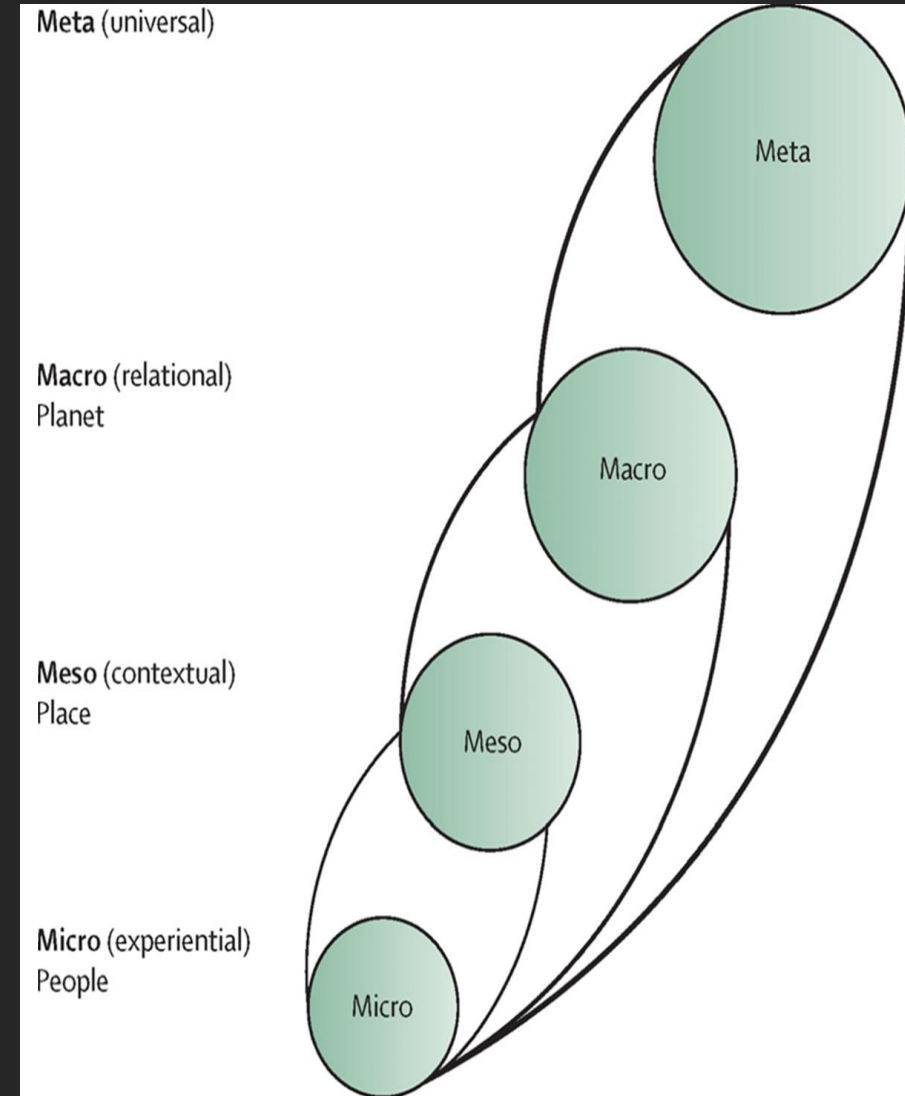
Iceberg model for systems thinking

- Symptoms / Events: what's happening?
- Patterns & trends: what trends are there over time?
- Systems structures & drivers: how are the parts related? What influences the patterns?
- Mental models: what values, assumptions, beliefs, shape the system?



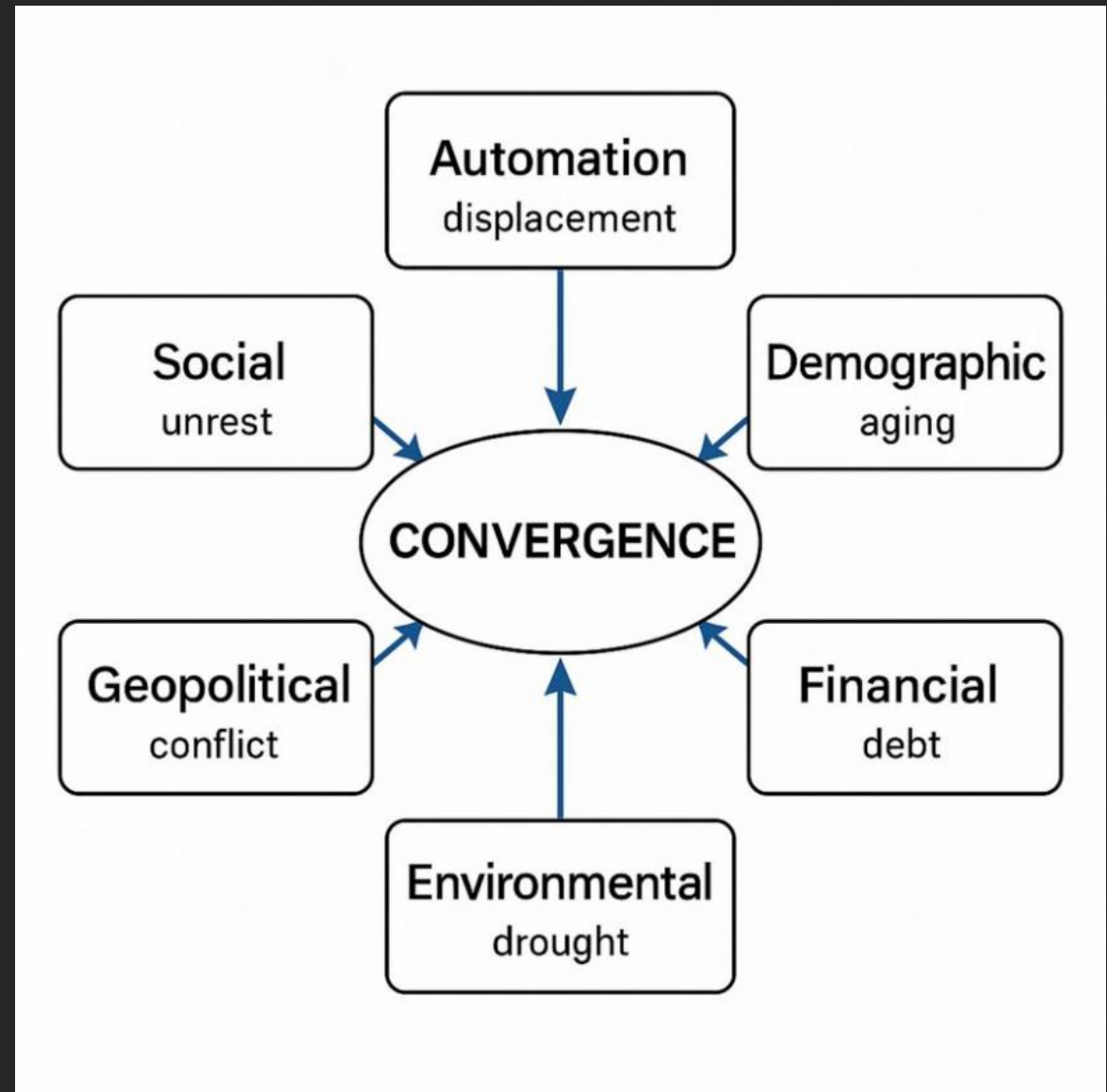
Systems thinking: scalar issues

- **Meta** / global scale: climate, land use change, freshwater (stocks, flows), biogeochemical cycles, biodiversity
 - Economics & politics of global trade
- **Meso** scale: EU policies (rules, incentives); National governments: economic growth
 - Society: national characteristics, demographic & cultural change
- **Micro** scale: region, city, district: place-specific characteristics & issues
 - Schools: Creating opportunities to make a difference in classroom & wider networks



Domain mapping

- Foundational: provide a broad scoping of the issue
- First step before developing a systems map
- Establishes the parameters, boundary: what's in, what's out?
- Identify 5-10 elements
- Consider context



Systems map

- Identify within the system: key actors, processes, structures, functions
- Establish system boundaries (territorial, institutional) but what are the influences from outside this system?
- While looking for shocks & stress remember ongoing processes of change within the system (eg demographic – ageing)
- Identify feedback loops: are they reinforcing or balancing?
- Identify points of intervention: where is it most efficacious to act?
- Redundancy: does the system have spare capacity or tightly wound?

Steps

- Framing the issue. Formulating a problem statement.
- Prepare a domain diagram.
- Identify key assumptions & expectations of their continuity.
- Horizon scanning: what do we need to know?
- System mapping: the components (nodes) & connections.
 - Annotating or colour coding can distinguish different flows.
- Scenarios: Envisioning a range of possible future outcomes; identify challenges & opportunities; feasibility/realism; how could the system evolve?
- Policy mapping: devising strategic pathways to realise preferred outcomes.

Topics

- Urban transportation: what needs to be done to improve mobility?
- What are the drivers & consequences of fast fashion? How to address them?
- How to transition from fossil fuels: what are the key pathways?
- How should cities prepare for greater heat stress?
- What measures are needed to prevent flooding of densely populated areas?
- What can we do about plastic packaging?

Method

- Group members: Roles: a scribe to record in text key points; a rapporteur to report back; a map chief to confirm additions;
- 10 mins brain-storming of topic
- 15 mins domain mapping
- 45-60 mins + preparing a systems map
- 15 mins review & scenario planning
- 30-45 mins report back
- Lunch!