Appendix
A Partial Inventory of Epistemic Concepts [20, 26]

Epistemic Level	*Epistemic Dimensions*	*Sample Epistemic Concepts*
Observational	**Observations and measurements**	• Verifiable information versus values • Systematic study (vs. anecdote) • Relevant observations • Accuracy, precision / measurement uncertainty • Completeness of data • Proxy variables • Material contaminants
	Experiments	• Controlled experiments • Blind and double-blind studies • Sample size and replicates • Randomized sampling • Documentation (lab notebooks)
	Instruments	• New instrument technology • Calibration • Artifacts • Models and model organisms • Ethics of human-subject experimentation
Conceptual	**Forms of reasoning**	• Causation vs. correlation • Probabilistic inference • Statistical analysis of uncertainty • Alternative explanations • Heuristics • Logical fallacies • Models • Robustness
	Creativity & history	• Consilience with established evidence • Analogy • Interdisciplinary thinking • Imagination and creative synthesis • Conceptual change
	Human dimensions	• Motivations for doing science • Confirmation bias/role of prior beliefs • Availability bias • Flaws in probabilistic reasoning • Motivated reasoning
	Cultural contexts	• Gendered perspective • Race-based perspective • Class/political-based perspective • Religious/ideological perspective

Epistemic Level	*Epistemic Dimensions*	*Sample Epistemic Concepts*
SOCIAL-LEVEL	**Economics/funding**	• Choice of research question • Conflict of interest
	Institutions	• Collaboration and competition among scientists • Forms of persuasion • Peer review / forums for open debate • Academic freedom / conflict of interest • Consensus panels • Social responsibility of scientists
	Publication & peer review	• Norms for handling and sharing scientific data • Pre-registration of data analysis methods • Nature of graphs • Publishing conventions • Pre-publication peer review • Professional credibility • Fraud or other forms of malpractice • Diversity and critical consensus
PUBLIC (COMMUNICATIVE)	**Credibility**	• Verifiable credentials • Track record of honest reporting • Institutional framework • History of responsible gatekeeping • Conflict of interest / neutrality
	Expertise	• Record of past achievements • Educational background • Experience • Peer recognition and leadership • Peer certification • Consensus of relevant experts
	Deceptive tactics	• False experts • Identity politics and social emotions • Blind skepticism • Repetition • Style over substance
PERSONAL AND PUBLIC DECISION-MAKING		