

# Knowledge Representations Quickstart

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# Knowledge Representations

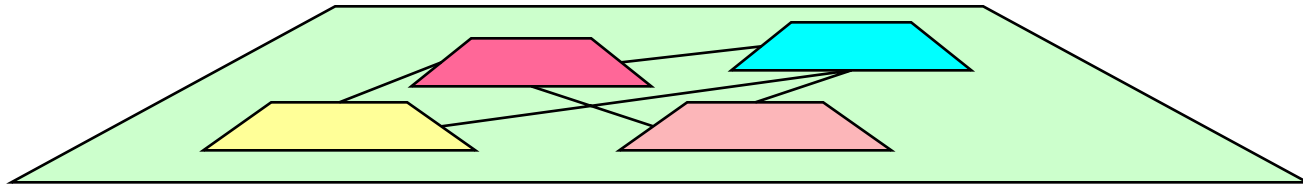
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*A knowledge representation (KR)* is a structure for expressing, communicating, and thinking about important entities and relationships in some domain.

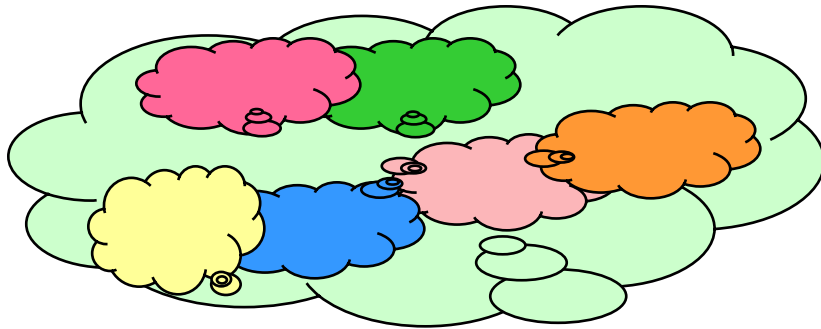
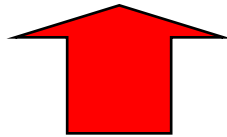
- Maps, wiring diagrams, physics equations, nested lists, 7-layer OSI model for computer networks.
- Object models, for business systems and computer systems.
- Evidence-centered design models & structures, incl. object models

# Knowledge Representations

Reasoning through the affordances of the KR

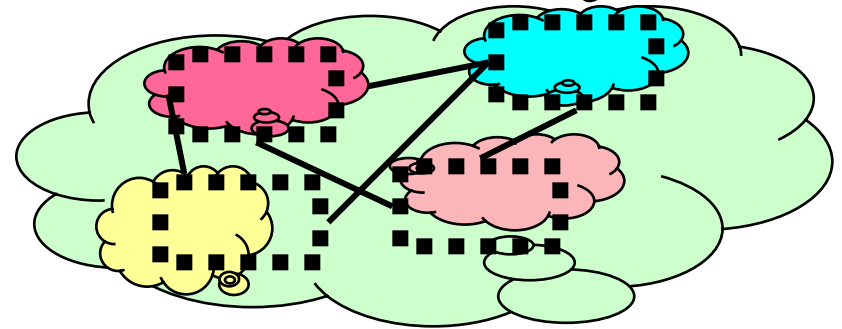
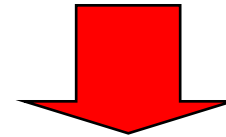


Perceiving the Real-World Situation through the KR



Real-World Situation

Reconceiving /  
Reconstructing the  
Real-World Situation  
through the KR



Reconceived Real-World Situation

# Knowledge Representations

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They are surrogates for something else--a real world situation, or a class of situations, or a representation in other KRs.

- They capture some entities and relationships, but ignore others.
- The collection of entities and relationships is called the *ontology* of the KR.
- KRs support certain operations or reasoning
- KRs and “Mediated cognition”
- KRs and “Distributed cognition”

# KRs are useful when they highlight important relationships and make them easier to work with.

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They facilitate analogies across problems and domains.

- In what ways are AP Studio Art, the SAT, Hydrive, and a language proficiency alike?

They make it easier to acquire and structure information.

- ECD design process in ETS Teaching & Learning programs

They can facilitate working together.

- ECD object model for sharing, re-using, repurposing the elements and processes in assessments.

They are significant in planning.

- What will a solution have to look like? What elements in assessments can vary substantially, but what relationships must hold?

Overlapping KRs coordinate work in complex systems.

- Multiple ECD KRs, with bridges between them.

# Roles of KR in assessment

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- (1) An assessment is itself a KR. It makes explicit and sharable the knowledge that is valued, the ways it is used, and the standards of good work.
- (2) The analysis of any domain in which learning is to be assessed must include the identification and analysis of the KR in that domain (i.e., the "domain KR").
- (3) Assessment tasks can be structured around the knowledge, relationships, and uses of domain KR.
- (4) "Design KR" can be created to organize knowledge about a domain (including its domain KR) in forms that support the design of instruction and assessment. (e.g., knowledge elicitation tools)
- (5) KR from the disciplines of instructional design and assessment design can guide and structure the domain analyses noted in (2), the task construction noted in (3), and the creation and use of design KR noted in (4).