Defining the Assessment Observations: the Task Model

Britte Haugan Cheng and Geneva Haertel

SRI International

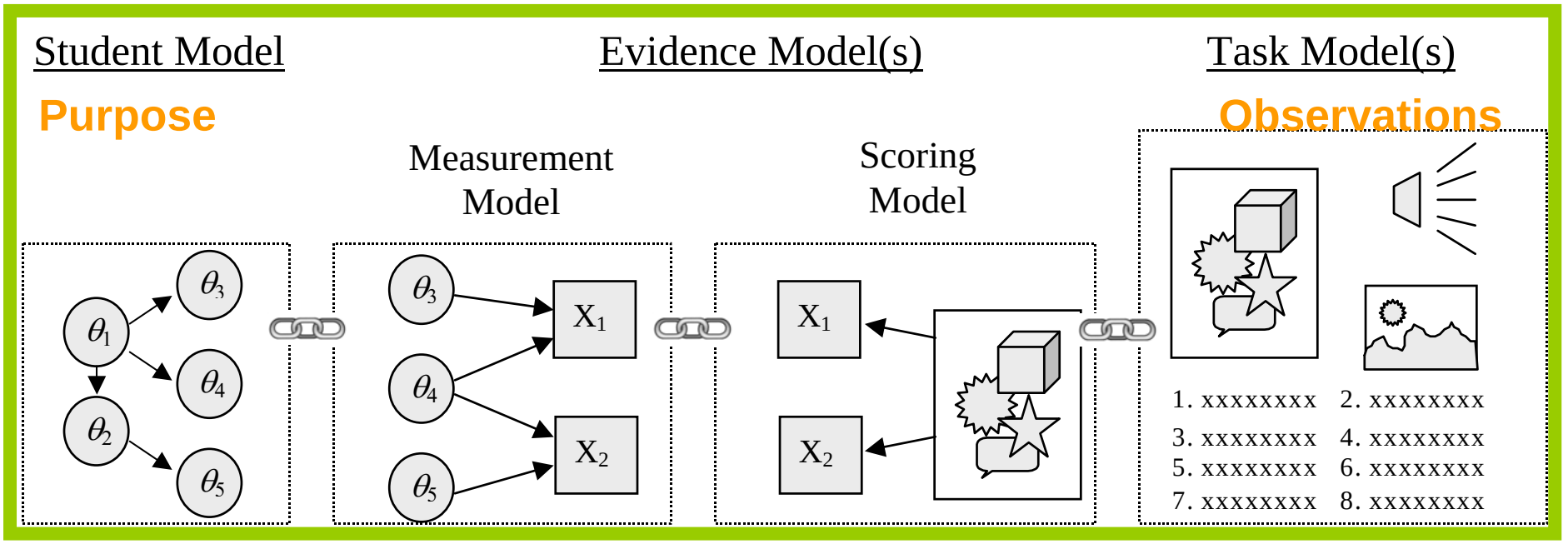
Design Questions to Answer

What are the inferences that need to be drawn about student proficiencies? (Student Model)

What evidence is required to draw those inferences and how will you elicit that evidence? (Task Model)

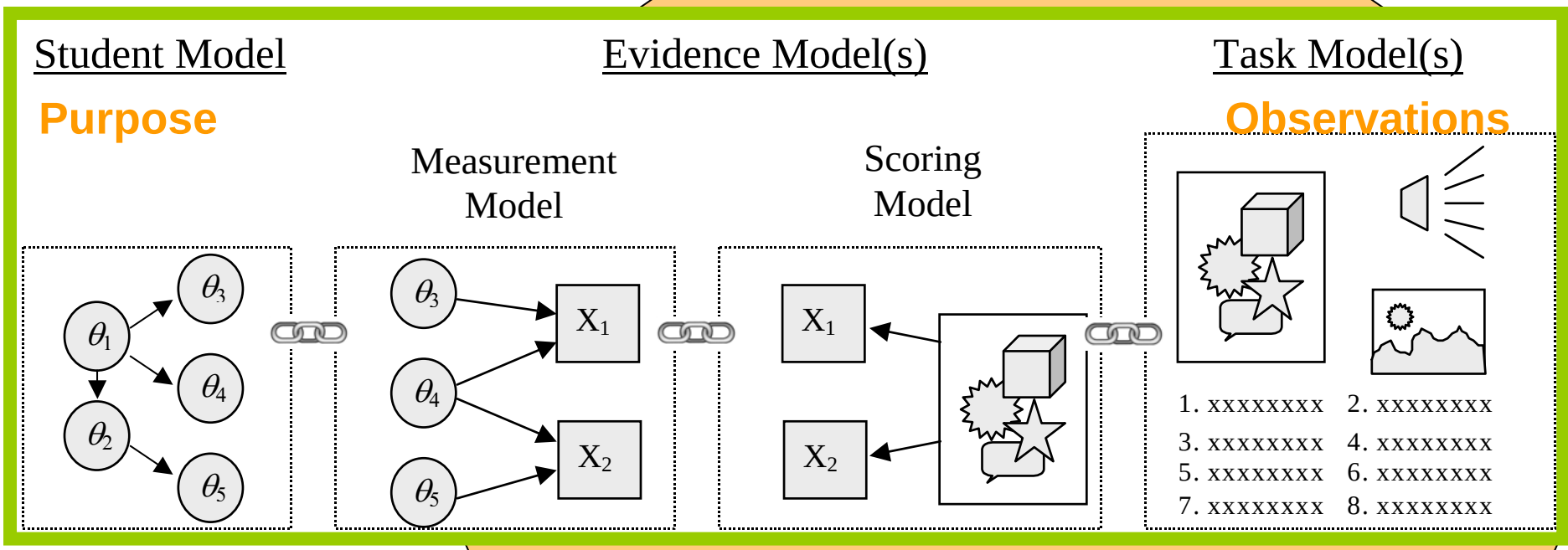
How are observations aligned with inferences? (Evidence Model)

The Assessment Argument



- **4 models to get right.**

The Assessment Argument

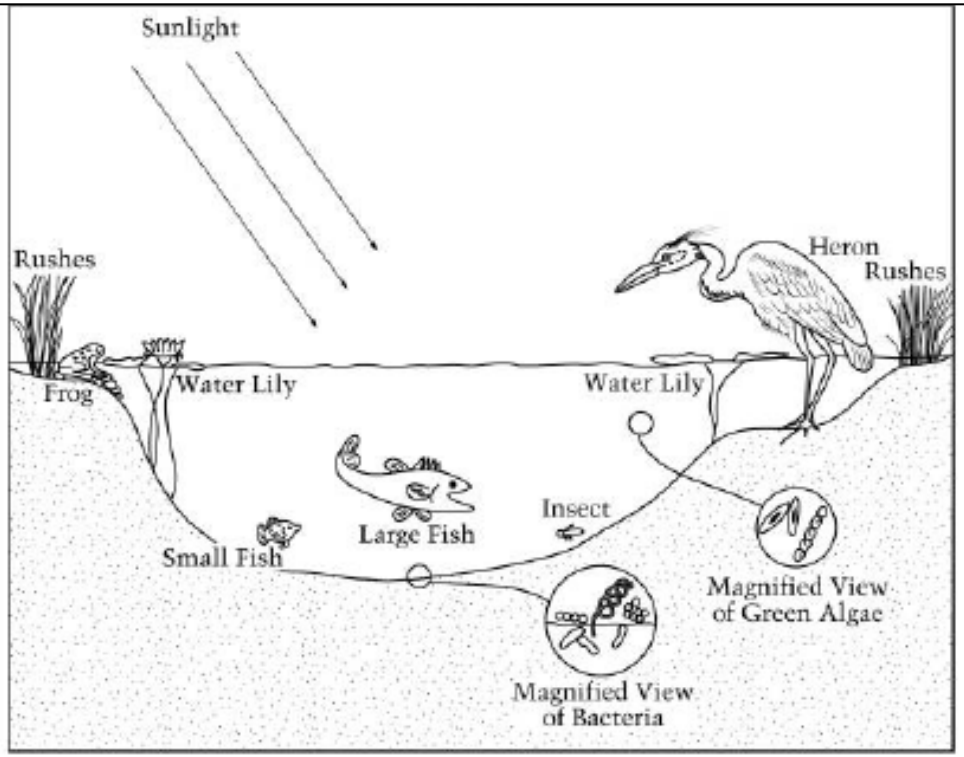


Information in Design Patterns foreshadows model articulation in Templates

The Task Model in PADI

- Design Patterns
- Templates

BioKIDS Activity



http://nces.ed.gov/nationsreportcard/itmrls/

10. If all of the small fish in the pond system died one year from a disease that killed only the small fish, what would happen to the algae in the pond? Explain why you think so.

Foreshadowing The Task Model in *Design Patterns*

- Potential Observations: Qualities of performances expected from a student who has the necessary KSAs *(e.g., logical consistency between claim and evidence, data used to support the claim are relevant)*

(Examples are from the BioKIDS *Formulating Scientific Explanations from Evidence* Design Pattern.)

Foreshadowing The Task Model in *Design Patterns*

- Potential Observations: Qualities of performances expected from a student who has the necessary KSAs *(e.g., logical consistency between claim and evidence, data used to support the claim are relevant)*
- **Potential Work Products: Products a student might produce to demonstrate KSAs *(e.g., multiple choice, written response)***

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Foreshadowing The Task Model in *Design Patterns*

- Potential Observations: Qualities of performances expected from a student who has the necessary KSAs *(e.g., logical consistency between claim and evidence, data used to support the claim are relevant)*
- Potential Work Products: Products a student might produce to demonstrate KSAs *(e.g., multiple choice, written response)*
- **Characteristic Features: Aspects of assessment situations that setup the opportunity to get evidence about the focal KSA *(e.g., students provided with a context or scenario about which to make a scientific claim)***

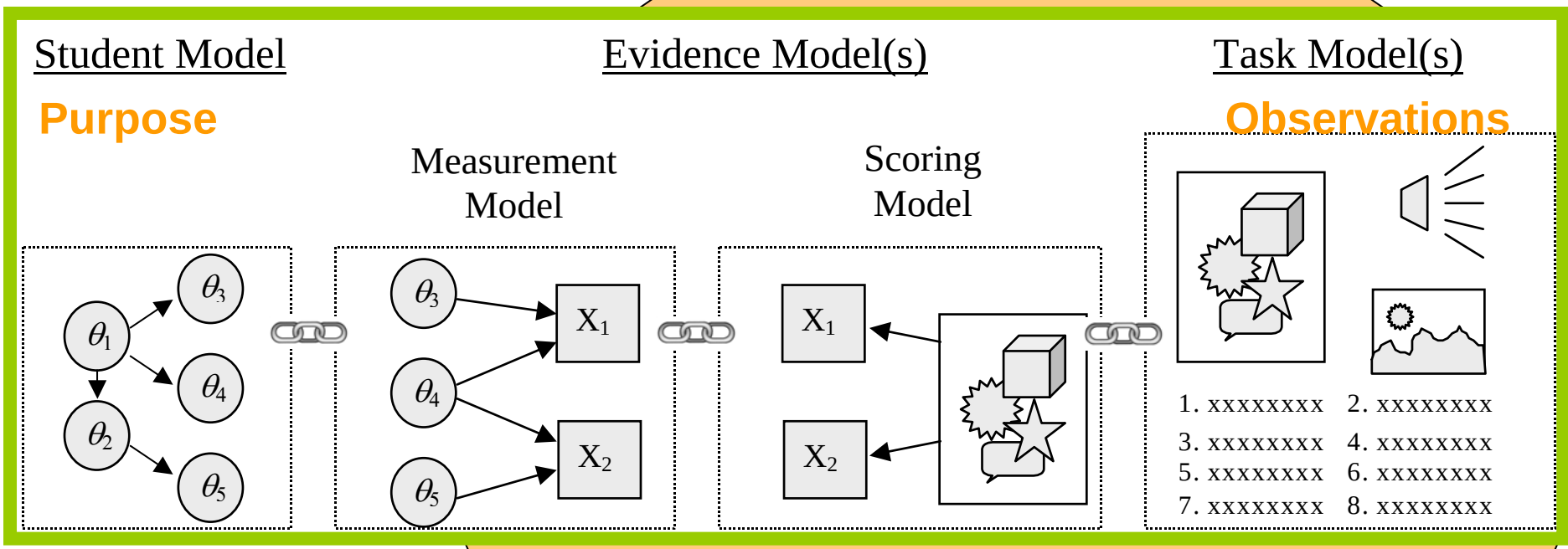
(Examples are from the BioKIDS *Formulating Scientific Explanations from Evidence* Design Pattern.)

Foreshadowing The Task Model in *Design Patterns*

- Potential Observations: Kinds of performances expected from a student who has the necessary KSAs *(e.g., logical consistency between claim and evidence, data used to support the claim are relevant)*
- Potential Work Products: Products a student might produce to demonstrate KSAs *(e.g., multiple choice, written response)*
- Characteristic Features: Aspects of assessment situations likely to evoke the desired evidence *(e.g., students provided with a context or scenario)*
- **Variable Features: Aspects of assessment situations that can be varied to shift difficulty or focus *(e.g., difficulty of content, degree of scaffolding for explanation)***

(Examples are from the BioKIDS *Formulating Scientific Explanations from Evidence* Design Pattern.)

The Assessment Argument



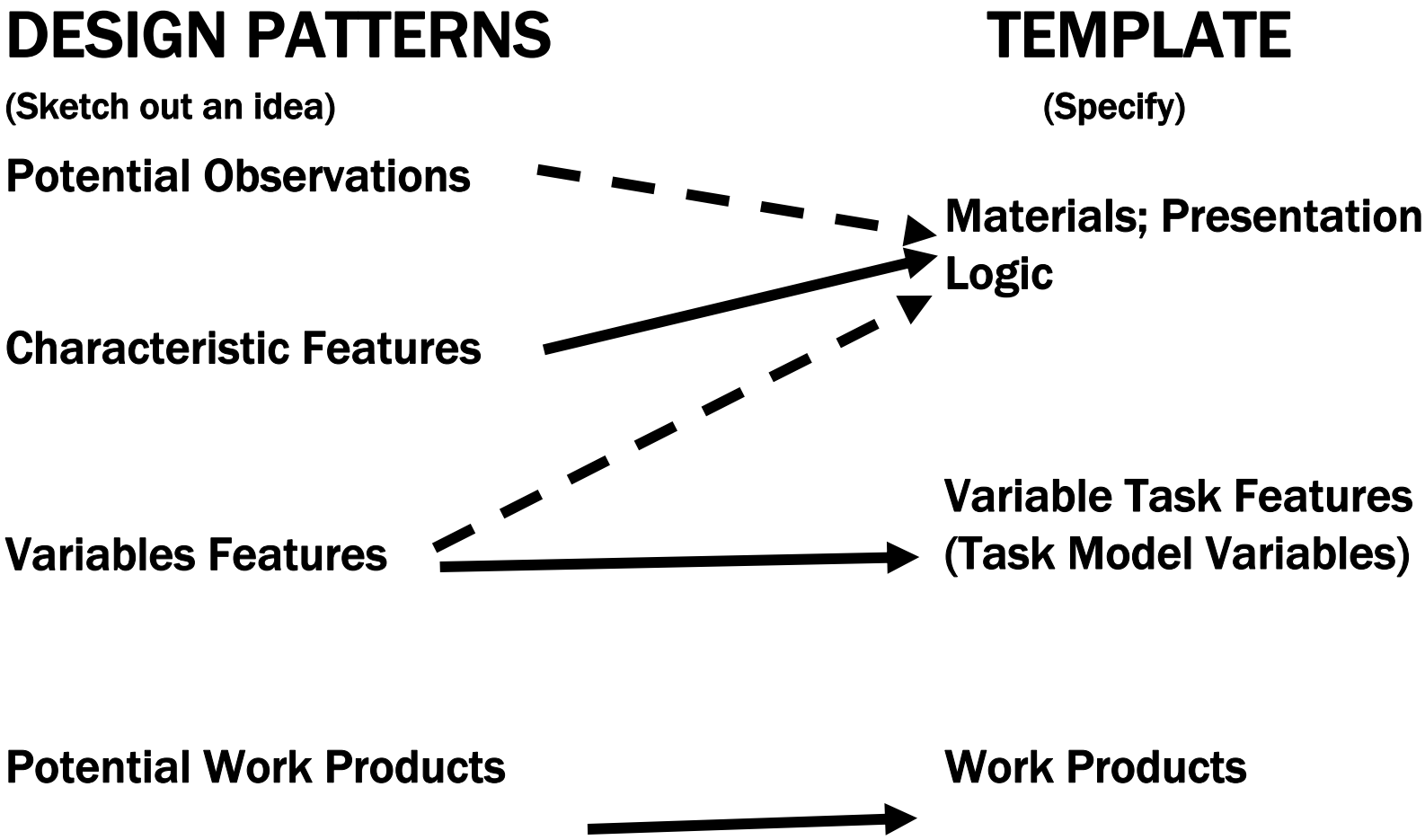
Information in Design Patterns foreshadows model articulation in Templates

The Task Model in *PADI Templates*

Templates

- Support the specification of technical details
- Serve as a **blueprint:** abstraction of multiple assessment tasks
- Become a task specification when most template components are specified
- Attributes related to the Task Model: **Materials, Presentation Logic**, **Task Features**, **Work Products**

Relating Task Model Components



The Task Model in *PADI Templates*

- Materials : Types of stimuli and prompts presented to students *(e.g., Problem Illustration, Problem Text, Prompt for Claim Statement, Prompt for Evidence)*

(Examples are from the BioKIDS *Step 3 Complex Open Ended Written Response* Activity.)

The Task Model in *PADI Templates*

- Materials : Types of stimuli and prompts presented to students *(e.g., Problem Illustration, Problem Text, Prompt for Claim Statement, Prompt for Evidence)*
- **Presentation Logic: How materials are presented to students (e.g., presentation order = all at once, floating pencil = sequential)**

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- **Task Features (Task Model Variables): Aspects of assessment situations that can be varied to shift difficulty or focus *(e.g., Scaffolding, Content Knowledge Required)***

(Examples are from the BioKIDS *Step 3 Complex Open Ended Written Response* Activity.)

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- Materials : Types of stimuli and prompts presented to students *(e.g., Problem Illustration, Problem Text, Prompt for Claim Statement, Prompt for Evidence)*
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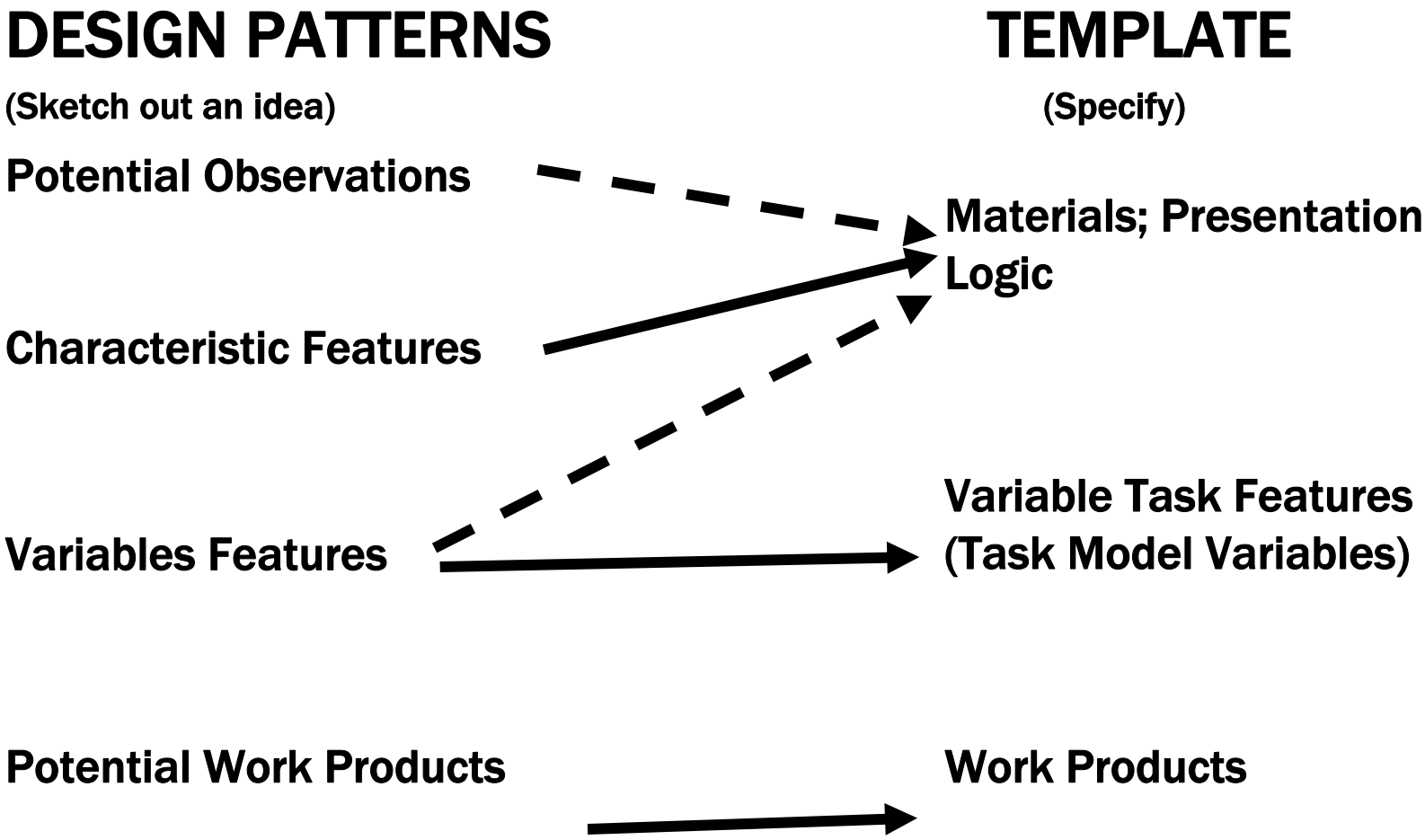
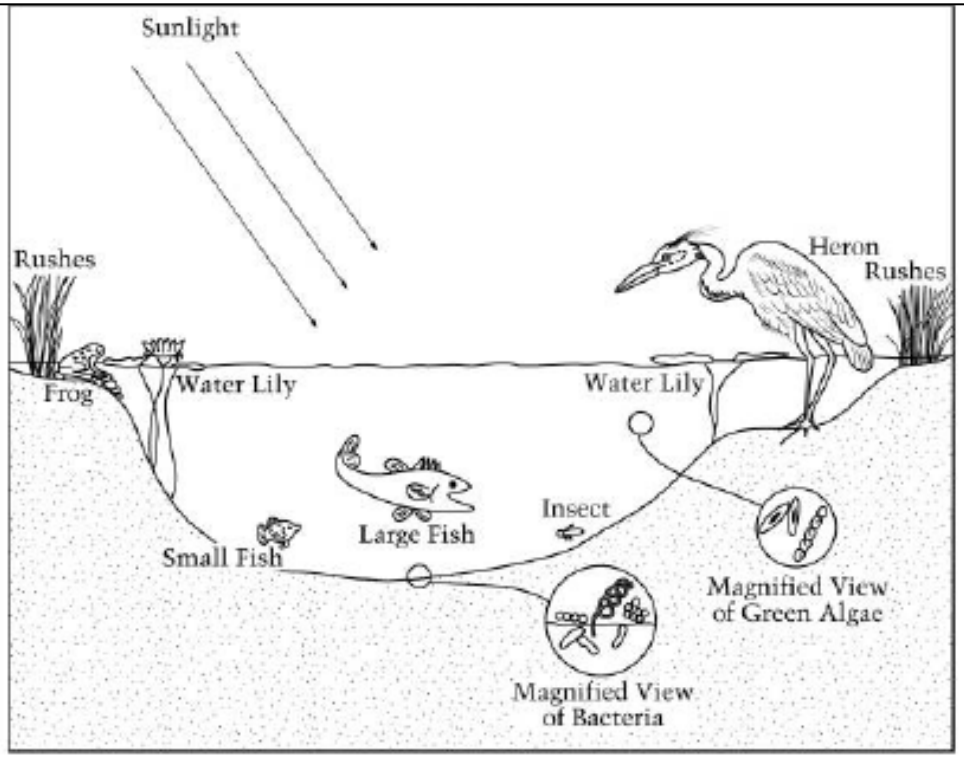
- Task Features (Task Model Variables): Aspects of assessment situations that can be varied to shift difficulty or focus *(e.g., Scaffolding, Content Knowledge Required)*
- **Work Products: Types of products a student might produce *(e.g., Claim Statement or choice of claim statement, List of evidence or written explanation)***

(Examples are from the BioKIDS *Step 3 Complex Open Ended Written Response* Activity.)

Relating Task Model Components



BioKIDS Activity



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Going to the design system….

Reverse-Engineering TIMSS Activities

Reverse-Engineering

- A process of creating a design or blueprint by analyzing a final product or system—often via identification of system components and their interrelationships —and creating representations of that product or system in an enhanced form or at a higher level of abstraction (e.g., IEEE, 2003).

Goals

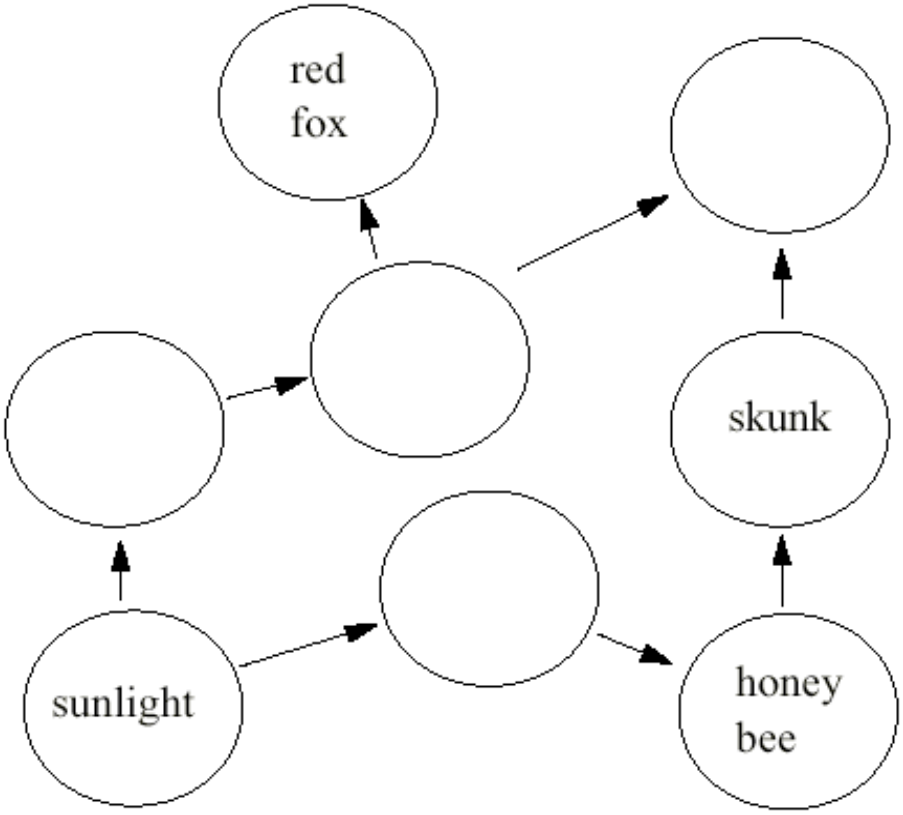
- To identify key Task Model components (materials, variable task features, work products) in existing activities

- To define Task Model components so that they are "reusable"

Reverse-Engineering TIMSS Items

Fill in each circle in this food web with the letter of the correct plant or animal from the list. Remember that the arrows point from the energy provider to the energy user.

A. Owl
B. Rose
C. Grass
D. Rabbit



Reverse-Engineering TIMSS Activities

Materials

- Partially completed food web
- Prompt to students to complete food web
- List of animals to include in blanks
- Hint about meaning of arrow direction

Variable Task Features

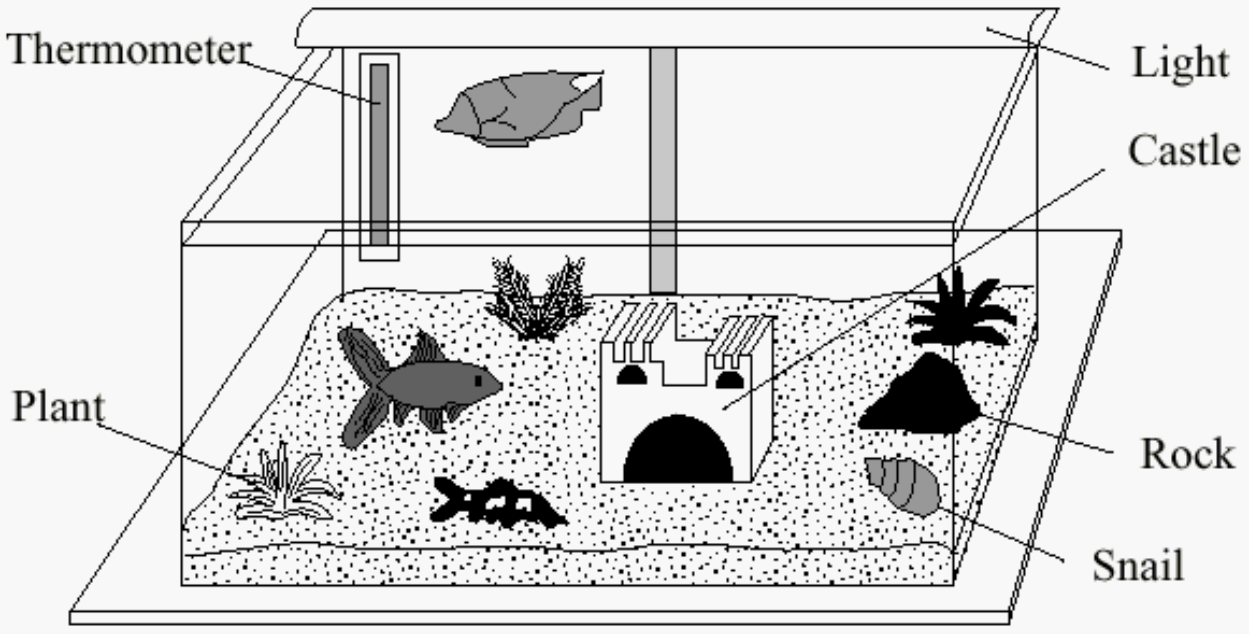
- Number of animals included in food web (4, 5, 6, 7, 8)
- Number of blanks to complete (1, 2, 3, 4)
- Inclusion of hint about arrow direction (No, Yes)

Work Products

- Complete food web (animal names entered in blanks)

Reverse-Engineering TIMSS Activities

In the picture of an aquarium, six items are labeled.



Explain why each of the following is important in maintaining the ecosystem in the aquarium.

A. the plant
B. the light

Reverse-Engineering TIMSS Activities

Materials

- Picture of aquarium with plants, fish, snail, rock, thermometer, and castle
- Labels for objects/organisms in aquarium
- Prompt to explain why object/organism is important in the ecosystem

Variable Task Features

- Inclusion of labels for objects/organisms (No, Yes)
- Number of explanations requested (1, 2, 3)

Work Products

- Explanation of why object/organism is important in the ecosystem

Forward-Engineer a New Assessment Task

Materials

- *Simulation* of aquarium with plants, fish, snail, rock, thermometer, and castle
- ?Labels for objects/organisms in aquarium?
- ?Prompt to explain why object/organism is important in the ecosystem?

Variable Task Features

- ?Inclusion of labels for objects/organisms (No, Yes)?
- ?Number of explanations requested (1, 2, 3)?
- ?Control of ecosystem variables?

Work Products

- ?Explanation of why object/organism is important in the ecosystem?
- ?Prediction of ecosystem characteristics?

PADI Webinars: Key Points

- **Assessment as argument**
  - ECD makes argument structures explicit
  - Provides support for good practices
    - Helpful for validity and efficiency (esp. with more complex assessment)
- **PADI Design Patterns**
  - conceptual support, tie in with cognitive research, foreshadows templates
- **Templates**
  - more technical, particularly helpful in large-scale and tech. based assessment

PADI Work

- DRK12: Application of Evidence-Centered Design to Large Scale Science Assessment (Minnesota)
- IES: Principled Science Assessment Designs for Students with Disabilities (Kansas, Kentucky, S. Carolina, Nevada)
- IES: Domain Specific Assessment in Biology and Economics in Community College
- US Dept of Ed. OSEP: Use of Principled Assessment Design to Build State-wide Mathematics Assessments for 1% Students (Utah, Florida, and Idaho)
- Use of Principled Assessment Design to Build Science Assessments for ELL Students

Thank You

Further contact with our team

Email: geneva.haertel@sri.com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