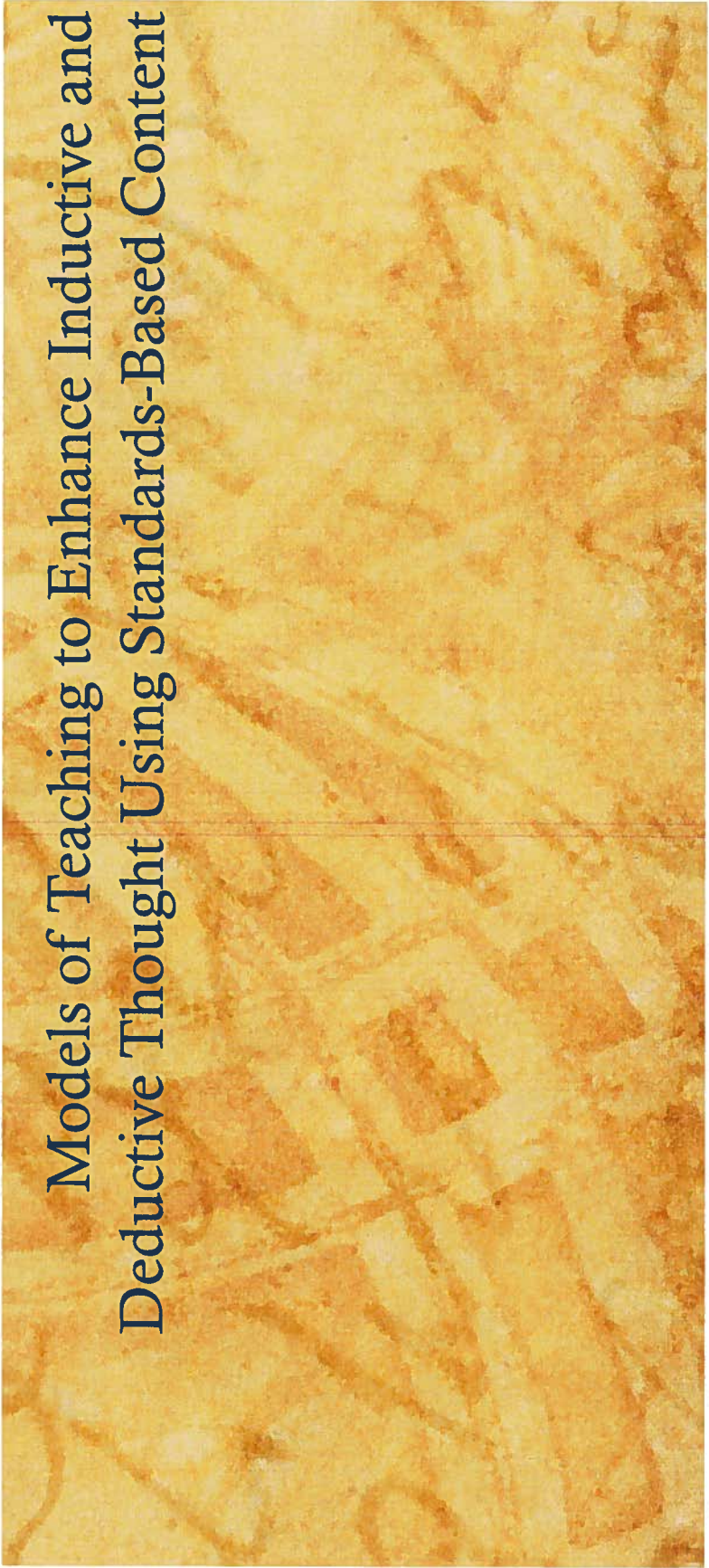




Inductive & Deductive Reasoning

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Models of Teaching to Enhance Inductive and
Deductive Thought Using Standards-Based Content

What is the difference between *curriculum* & *pedagogy*?

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What are *models of teaching*?

- Lesson type
- Pedagogical (Instructional) Sequence
- Move students from Not Knowing to Knowing
- Based on research and theory
- Follow a distinctive syntax

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Types of Knowledge

```

graph LR
    A[Types of Knowledge] --> B[Declarative]
    A --> C[Procedural]
    A --> D[Conditional]
    B --> E[Facts]
    B --> F[Concepts]
    B --> G[Big Ideas]
    C --> H[Skills]
  
```

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Direct Instruction

Didactic

1 2 3 4 5

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DIRECT INSTRUCTION

```

graph LR
    A[Knowledge] --> B[Declarative]
    A --> C[Procedural]
    A --> D[Conditional]
    B --> E[Facts]
    B --> F[Concepts]
    B --> G[Big Ideas]
    C --> H[Skills]
  
```

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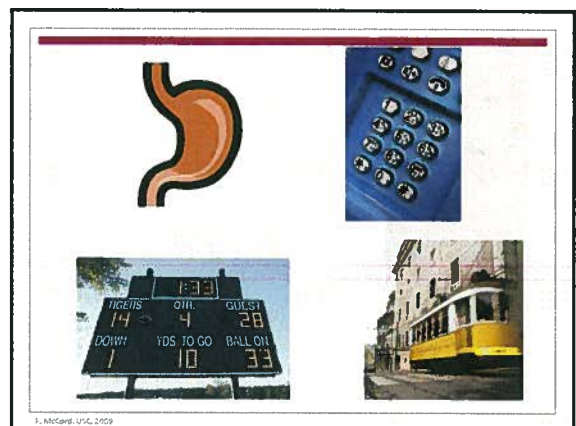
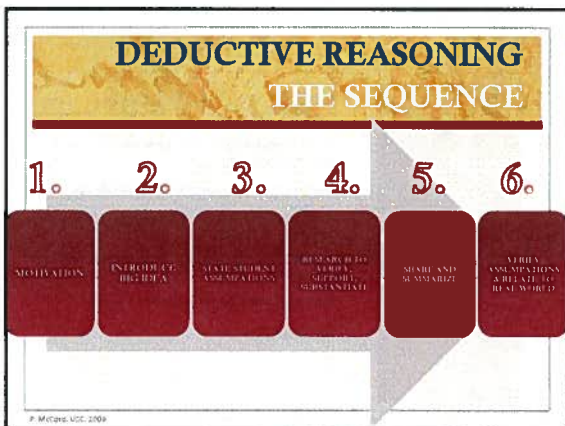
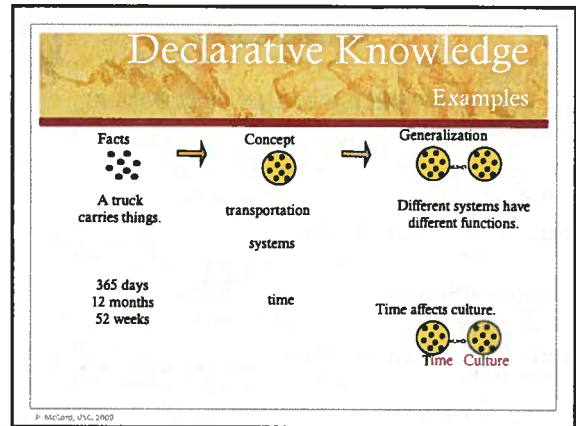
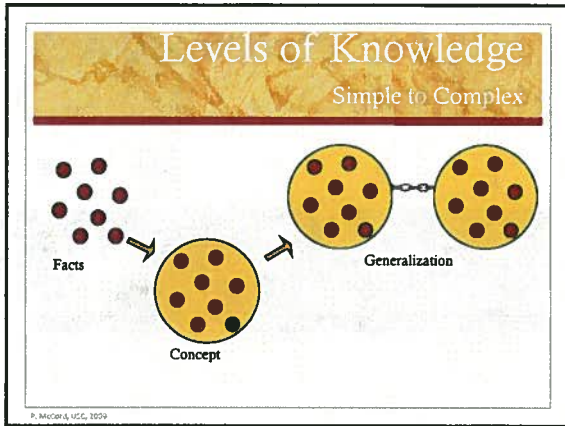
CONTENT DRIVEN MODELS

What →

```

graph LR
    A[Knowledge] --> B[Declarative]
    A --> C[Procedural]
    A --> D[Conditional]
    B --> E[Facts]
    B --> F[Concepts]
    B --> G[Big Ideas]
    C --> H[Skills]
  
```

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DEDUCTIVE REASONING

Big Idea: **SYSTEMS HAVE PARTS THAT INTERRELATE.**

Our Assumptions

Parts of a system work together.

All systems are made of parts that are connected together.

The organs of the digestive system work together to turn food into energy for our bodies.

The wheels of a trolley relate to the wheels on a bus.

Our Research

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Your Digestive System and How it Works

The Digestive System

- The digestive system is made up of the organs that break down the food we eat into nutrients that our body can use.
- The digestive system is made up of the organs that break down the food we eat into nutrients that our body can use.

The Human Respiratory System

Breathing

In mammals, the diaphragm contracts the body cavity and the lungs expand, which causes air to enter the lungs.

P. McCard, USC, 2009

UNIVERSAL CONCEPTS AND GENERALIZATIONS

CONCEPTS

- | | |
|--------------------|------------------|
| 1. Change | 5. Power |
| 2. Conflict | 6. Structure |
| 3. Order vs. Chaos | 7. Systems |
| 4. Patterns | 8. Relationships |

CONCEPTS AND GENERALIZATIONS

1. Change

- Change generates additional change
- Change can be either positive/negative
- Change is inevitable
- Change is necessary for growth
- Change can be evolutionary or revolutionary

2. Conflict

- Conflict is composed of opposing forces
- Conflict may be natural or human-made
- Conflict may be intentional or unintentional
- Conflict may allow for synthesis and change

3. Order vs. Chaos

- Order may be natural or constructed
- Order may allow for prediction
- Order is a form of communication
- Order may have repeated patterns
- Order and chaos are reciprocals
- Order leads to chaos and chaos leads to order

4. Patterns

- Patterns have segments that are repeated
- Patterns allow for prediction
- Patterns have an internal order
- Patterns are enablers

5. Power

- Power is the ability to influence
- Power may be used or abused
- Power is always present in some form
- Power may take many forms (chemical, electrical, political, mechanical)

UNIVERSAL CONCEPTS AND GENERALIZATIONS

(Continued)

6. Structure

- Structures have parts that interrelate
- Parts of structures support and are supported by other parts
- Smaller structures may be combined to form larger structures
- A structure is no stronger than its weakest component/ part

7. Systems

- Systems have parts that work to complete a task
- Systems are composed of sub-systems
- Parts of systems are interdependent upon one another and form symbiotic relationships
- A system may be influenced by other systems
- Systems interact
- Systems follow rules

8. Relationships

- Everything is related in some way
- All relationships are purposeful
- Relationships change over time

LESSON PLAN

Name: _____

Date: _____

Subject: _____

Model of Teaching: **DEDUCTIVE REASONING**

Standard:

Objective:

Syntax	Activity	Script
Motivation State the objective		
Present the "big idea"		
Solicit student assumptions		
Research to verify, support, substantiate		
Share and summarize		
Reference/ Verify original student assumptions & Relate to real world, other subject areas		

LESSON PLAN

Name: _____

Date: _____

Subject: _____

Model of Teaching: **INDUCTIVE REASONING**

Standard:

Objective:

Syntax	Activity	Script
Motivation and state the objective		
Enumerate, list formation		
Group information, identifying common properties		
Label and categorize the groups		
Form and state the generalization or big idea		