The Concept Comparison Routine

The Content Enhancement Series

2015
California State University, Fullerton
Adrian Jung, Ph.D.
Content Enhancement

A way of teaching an academically diverse group of students in which:

– Both group and individual needs are valued and met;

– The integrity of the content is maintained;
A way of teaching an academically diverse group of students in which:

- Critical features of the content are selected and transformed in a manner that promotes student learning; and

- Instruction is carried out in a partnership with students.
Guidebooks in the Content Enhancement Series

• Routines for planning and leading learning
  – Course Organizer Routine
  – Unit Organizer Routine
  – Lesson Organizer Routine
Guidebooks in the Content Enhancement Series

- Routines for exploring text, topics, and details
  - Clarifying Routine
  - Framing Routine
  - Survey Routine
  - The ORDER Routine
Guidebooks in the Content Enhancement Series

- Routines for teaching concepts
  - Concept Anchoring Routine
  - Concept Comparison Routine
  - Concept Mastery Routine
Guidebooks in the Content Enhancement Series

- Routines for enhancing performance
  - Quality Assignment Routine
  - Question Exploration Routine
  - Recall Enhancement Routine
  - Vocabulary LINCing Routine
Understanding the Challenge of Diversity

- Introduction of difficult but important concepts requires creating connections to background knowledge.

- Increased student diversity results in varying levels and types of background knowledge.
Understanding the Challenge of Diversity

• Students need new ways of thinking about critical concepts and relationships between concepts.

• Teachers can take advantage of student diversity by comparing concepts from different perspectives.
Responding to the Challenge

The Concept Comparison Routine helps students to:

• Focus on key concepts.

• Focus attention on similarities and differences between known concepts.

• Understand the usefulness of higher-order categories in understanding and learning.
The Concept Comparison Routine helps students to:

- Develop ways to explain and summarize similarities and differences between concepts.
- Remember a way to compare and contrast known concepts.
The Concept Comparison Routine helps students to:

- Interact with the teacher and other students to explore and understand relationships between concepts.
- Record information for later studying and use.
The Comparison Table
Teaching Device

Is a visual device that:

• is used under teacher guidance;

• focuses careful attention on more than one concept;

• identifies relevant features of each concept;
The Comparison Table

Teaching Device

<table>
<thead>
<tr>
<th>Is a visual device that:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• prompts analysis of similarities and differences of relevant features;</td>
</tr>
<tr>
<td>• helps students summarize relationships between concepts;</td>
</tr>
<tr>
<td>• helps identify higher-order categories related to the relevant concepts;</td>
</tr>
</tbody>
</table>
The Comparison Table
Teaching Device

Is a visual device that:

- is designed to enhance student...
  - understanding of concept relationships,
  - remembering of ways to think about new, difficult information,
  - responses to evaluation tasks and activities, and
  - belief in the value of the content.
### Comparison Table

<table>
<thead>
<tr>
<th>Concept</th>
<th>Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Concept</td>
<td>Overall Concept</td>
</tr>
<tr>
<td>Communicate Targeted Concepts</td>
<td>Communicate Targeted Concepts</td>
</tr>
<tr>
<td>Obtain the Overall Concepts</td>
<td>Obtain the Overall Concepts</td>
</tr>
<tr>
<td>Make lists of Known Characteristics</td>
<td>Make lists of Known Characteristics</td>
</tr>
<tr>
<td>Pin down Like Characteristics</td>
<td>Pin down Like Characteristics</td>
</tr>
<tr>
<td>Assemble Like Categories</td>
<td>Assemble Like Categories</td>
</tr>
<tr>
<td>Record Unlike Characteristics</td>
<td>Record Unlike Characteristics</td>
</tr>
<tr>
<td>Identify Unlike Categories</td>
<td>Identify Unlike Categories</td>
</tr>
<tr>
<td>Nail Down a Summary</td>
<td>Nail Down a Summary</td>
</tr>
<tr>
<td>Go Beyond the Basics</td>
<td>Go Beyond the Basics</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Like Characteristics</td>
<td>Like Characteristics</td>
</tr>
<tr>
<td>Most fly</td>
<td>Most fly</td>
</tr>
<tr>
<td>Warm-blooded</td>
<td>Warm-blooded</td>
</tr>
<tr>
<td>Live worldwide</td>
<td>Live worldwide</td>
</tr>
<tr>
<td>Feathers</td>
<td>Feathers</td>
</tr>
<tr>
<td>Backbone</td>
<td>Backbone</td>
</tr>
<tr>
<td>Young hatch from eggs</td>
<td>Young hatch from eggs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extensions</th>
<th>Extensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birds</td>
<td>Mammals</td>
</tr>
<tr>
<td>Most travel by foot</td>
<td>Most travel by foot</td>
</tr>
<tr>
<td>Warm-blooded</td>
<td>Warm-blooded</td>
</tr>
<tr>
<td>Live worldwide</td>
<td>Live worldwide</td>
</tr>
<tr>
<td>Hair</td>
<td>Hair</td>
</tr>
<tr>
<td>Backbone</td>
<td>Backbone</td>
</tr>
<tr>
<td>Most young born live</td>
<td>Most young born live</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Like Categories</th>
<th>Like Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertebrates</td>
<td>Verterbrates</td>
</tr>
<tr>
<td>How body temperature is regulated. Where they live. How their bodies are supported.</td>
<td>How body temperature is regulated. Where they live. How their bodies are supported.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unlike Characteristics</th>
<th>Unlike Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlike Characteristics</td>
<td>Unlike Characteristics</td>
</tr>
<tr>
<td>Most fly</td>
<td>Most fly</td>
</tr>
<tr>
<td>Feathers</td>
<td>Feathers</td>
</tr>
<tr>
<td>Young hatch from eggs</td>
<td>Young hatch from eggs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unlike Categories</th>
<th>Unlike Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unlike Categories</td>
<td>Unlike Categories</td>
</tr>
</tbody>
</table>

### Summary

Birds and mammals are two vertebrates that are alike with regard to how their body temperature is regulated, where they live, and how their bodies are supported. They are different in terms of what covers their bodies and how they travel from one place to another. They are also different in terms of how their young are born.
Comparison Table

1. The Known Concepts

 Represents the names of the Known Concepts to be explored in the lesson.
Comparison Table

1. Communicate Targeted Concepts
2. Obtain the Overall Concepts
3. Make lists of Known Characteristics
4. Pin down Like Characteristics
5. Assemble Like Categories
6. Record Unlike Characteristics
7. Identify Unlike Categories
8. Nail Down a Summary
9. Go Beyond the Basics

2. The Overall Concept

Represents the name of the larger group within which the targeted concepts fit.

**Overall Concept**

**VERTEBRATES**

**Concepts**

**Concept**

**Birds**

- Most fly
- Warm-blooded
- Live worldwide
- Feathers
- Backbone
- Young hatch from eggs

**Mammals**

- Most travel by foot
- Warm-blooded
- Live worldwide
- Hair
- Backbone
- Most young born live

Explore how many heart chambers birds and mammals have, and enter the information on the table.
3. Characteristics of Concepts

Describe the characteristics or distinguishing traits of the concepts to be explored

- **Birds**
  - Most fly
  - Warm-blooded
  - Live worldwide
  - Feathers
  - Backbone
  - Young hatch from eggs

- **Mammals**
  - Most travel by foot
  - Warm-blooded
  - Live worldwide
  - Hair
  - Backbone
  - Most young born live

- **Extensions**
  - Explore how many heart chambers birds and mammals have, and enter
4. Like Characteristics

Those qualities or attributes that the targeted concepts have in common.

- Warm-blooded
- Live worldwide
- Backbone

Other characteristics:
- Most fly
- Warm-blooded
- Live worldwide
- Feathers
- Backbone
- Young hatch from eggs
- Most travel by foot
- Warm-blooded
- Live worldwide
- Hair
- Backbone
- Most young born live
5. Like Categories

The larger groups or categories to which the Like Characteristics belong

**Like Characteristics**
- Warm-blooded
- Live worldwide
- Backbone

**Like Categories**
- How body temperature is regulated.
- Where they live.
- How their bodies are supported.

**Extensions**
Explore how many heart chambers birds and mammals have, and enter the information on the table.

**Concept**
- Communicate Targeted Concepts
- Obtain the Overall Concepts
- Make lists of Known Characteristics
- Pin down Like Characteristics
- Assemble Like Categories
- Record Unlike Characteristics
- Identify Unlike Categories
- Nail Down a Summary
- Go Beyond the Basics
Birds and mammals are two vertebrates that are alike with regard to how their body temperature is regulated, where they live, and how their bodies are supported. They are different in terms of what covers their bodies and how they travel from one place to another. They are also different in terms of how their young are born.
7. Unlike Categories

Larger groups or categories to which the Unlike Characteristics belong.

- Like Categories
  - How body temperature is regulated.
  - Where they live.
  - How their bodies are supported.

- Unlike Characteristics
  - Most fly
  - Feathers
  - Young hatch from eggs

  - Most travel by foot
  - Hair
  - Most young born live

- Unlike Categories
  - How they travel.
  - What covers their bodies.
  - How young are born.

Summary

Birds and mammals are two vertebrates that are alike with regard to how their body temperature is regulated, where they live and how their bodies are supported. They are different in terms of what covers their bodies and how they travel from one place to another. They are also different in terms of how their young are born.
Birds and mammals are two vertebrates that are alike with regard to how their body temperature is regulated, where they live and how their bodies are supported. They are different in terms of what covers their bodies and how they travel from one place to another. They are also different in terms of how their young are born.

8. Summary

An understanding of the similarities and differences between concepts that can either:

- explain how the concepts are alike or different in terms of named categories,
- explain how the concepts are alike or different in terms of both characteristics and categories, or
- raise questions or list insights gained from the comparison.
### Comparison Table

<table>
<thead>
<tr>
<th>Overall Concept</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Concept</th>
<th>Characteristics</th>
<th>Extensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Concept</td>
<td>Communicate Targeted Concepts</td>
<td>Explore how many heart chambers birds and mammals have, and enter the information on the table</td>
</tr>
<tr>
<td>Concept 2</td>
<td>Obtain the Overall Concepts</td>
<td></td>
</tr>
<tr>
<td>Concept 3</td>
<td>Make lists of Known Characteristics</td>
<td></td>
</tr>
<tr>
<td>Concept 4</td>
<td>Pin down Like Characteristics</td>
<td></td>
</tr>
<tr>
<td>Concept 5</td>
<td>Assemble Like Categories</td>
<td></td>
</tr>
<tr>
<td>Concept 6</td>
<td>Record Unlike Characteristics</td>
<td></td>
</tr>
<tr>
<td>Concept 7</td>
<td>Identify Unlike Categories</td>
<td></td>
</tr>
<tr>
<td>Concept 8</td>
<td>Nail Down a Summary</td>
<td></td>
</tr>
<tr>
<td>Concept 9</td>
<td>Go Beyond the Basics</td>
<td></td>
</tr>
</tbody>
</table>

#### 9. Extensions

An assignment on key information related to the targeted concepts that prompts further exploration or study.

- Most fly
- Warm-blooded
- Live worldwide
- Feathers
- Backbone
- Young hatch from eggs

- Most travel by foot
- Warm-blooded
- Live worldwide
- Hair
- Backbone
- Most young born live
Guide the teacher to:

- present the Comparison Table effectively;
- involve students in constructing and using the Comparison Table;
- investigate the relationship between concepts; and
- focus student attention on learning.
The COMPARING Linking Steps

- Communicate Targeted Concepts.
- Obtain the Overall Concept.
- Make Lists of Known Characteristics.
- Pin Down Like Characteristics.
- Assemble Like Categories.
- Record Unlike Characteristics.
- Identify Unlike Categories.
- Nail Down a Summary.
- Go Beyond the Basics.
The Linking Steps

These steps guide the teacher during the in-class, interactive presentation of the Comparison Table.

The teacher prepared a draft of the Comparison Table in advance of the lesson, but the final version is co-constructed with the students during class.

These steps are cued by the acronym COMPARING.
Try to make a statement like:

“By understanding the **economic conditions** in the **North** in 1860 and the **economic conditions** in the **South** in 1860 (concepts being compared), we can understand the **economic causes of sectionalism** in the U.S. (Overall Concept).”

“**Fish** and **mammals** (concepts being compared) are two kinds of **vertebrates** (Overall Concept).”
Try to make a statement like:

“Comedy and tragedy (concepts being compared) are two forms of drama (Overall Concept).”
## Comparison Table

### 1. Concept
- **Cooperation**
- **Competition**

### 2. Characteristics
- **Cooperation**
  - People working together
  - More than 1 person
  - Works shared by all members of the group
  - Rewards are shared
  - All members concerned about one another

- **Competition**
  - People or groups working against one another
  - More than 1 person
  - Work shared only within competing groups
  - Rewards are given to the best
  - Concerned only about yourself or your team

### 3. Extensions
- Consider how jobs are assigned within cooperative and competitive situations. Add information to your table as needed.

### 4. Like Characteristics
- More than 1 person

### 5. Like Categories
- How many people are involved

### 6. Unlike Characteristics
- People working together
- Works shared by all members of the group
- Rewards are shared
- All members concerned about one another

### 7. Unlike Categories
- People working against one another
- Work shared only within competing groups
- Rewards are given to the best
- Concerned only about yourself or your team

### Summary
Cooperation and competition are both ways to do work. Cooperation and competition are similar in the number of people involved—there’s always more than one person. Cooperation and competition are different in how people work together, how work is shared, who gets the rewards, and about whom the people are concerned (themselves or their teammates).
# Multiple-Concept Comparison Table

## Steps 1-3 of the Concept Comparison Routine

<table>
<thead>
<tr>
<th>Steps 1: communication Targeted Concepts</th>
<th>Steps 2: Obtain the Overall Concept</th>
<th>Steps 3: Make lists of Known Characteristics</th>
</tr>
</thead>
</table>

## Overall Concept

<table>
<thead>
<tr>
<th>Concept</th>
<th>Concept</th>
<th>Concept</th>
<th>Concept</th>
<th>Concept</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Characteristics</th>
<th>Characteristics</th>
<th>Characteristics</th>
<th>Characteristics</th>
</tr>
</thead>
</table>

- Steps 1: Targeted Concepts
- Steps 2: Overall Concept
- Steps 3: Known Characteristics
### Multiple-Concept Comparison Table, p. 2

**Steps 4 - 9 of the Concept Comparison Routine**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Concept</th>
<th>Concept</th>
<th>Concept</th>
<th>Concept</th>
<th>Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>① Like Characteristics</td>
<td>① Like Characteristics</td>
<td>① Like Characteristics</td>
<td>① Like Characteristics</td>
<td>① Like Characteristics</td>
<td>① Like Categories</td>
</tr>
<tr>
<td>② Unlike Characteristics</td>
<td>② Unlike Characteristics</td>
<td>② Unlike Characteristics</td>
<td>② Unlike Characteristics</td>
<td>② Unlike Characteristics</td>
<td>② Unlike Categories</td>
</tr>
<tr>
<td>③ Summary</td>
<td>③ Extensions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Steps 4:** Pin down Like Characteristics
- **Steps 5:** Assemble Like Categories
- **Steps 6:** Record Unlike Characteristics
- **Steps 7:** Identify Unlike Categories
- **Steps 8:** Nail down a Summary
- **Steps 9:** Go beyond the Basics
Birds and mammals are two vertebrates that are alike with regard to how their body temperature is regulated, where they live and how their bodies are supported. They are different in terms of what covers their bodies and how they travel from one place to another. They are also different in terms of how their young are born.
### Comparison Table

#### Overall Concept
Economic Causes of Sectionalism in the U.S.

1. **Concept**
   - Economic conditions in the North in 1860
   - Economic conditions in the South in 1860

2. **Characteristics**
   - Good ports
   - Good natural resources
   - Immigrants in labor force
   - Profit from industries
   - Good land transportation
   - Good credit with other countries

   - Good ports
   - Good natural resources
   - Slaves in labor force
   - Profit from growing cotton
   - Poor land transportation
   - Good credit with other countries

3. **Like Characteristics**
   - Good ports
   - Good natural resources
   - Good credit with other countries

4. **Unlike Characteristics**
   - Immigrants in labor force
   - Profit from industries
   - Good land transportation

   - Slaves in labor force
   - Profit from growing cotton
   - Poor land transportation

5. **Like Categories**
   - Quality of ports
   - Quality of natural resources
   - Quality of labor

6. **Unlike Categories**
   - Primary source of labor
   - Source of profits
   - Quality of land transportation

7. **Summary**

Sectionalism in the U.S. was partially caused by economic conditions in the North and South in 1860. Although the North and South both had good natural resources, ports, and credit, their primary sources of labor and profits were different, as was the quality of their land transportation. Thus, these three differences probably contributed to sectionalism.
## Comparison Table

<table>
<thead>
<tr>
<th>Concept</th>
<th>Characteristics</th>
<th>Unlike Characteristics</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperation</td>
<td>People working together</td>
<td>People working together against one another</td>
<td>Cooperation and competition are both ways to do work. Cooperation and competition are similar in the number of people involved—there’s always more than one person. Cooperation and competition are different in how people work together, how work is shared, who gets the rewards, and about whom the people are concerned (themselves or their teammates).</td>
</tr>
<tr>
<td></td>
<td>More than 1 person</td>
<td>Work shared only within competing groups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Works shared by all members of the group</td>
<td>Rewards are given to the best</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All members concerned about one another</td>
<td>Concerned only about yourself or your team</td>
<td></td>
</tr>
<tr>
<td>Competition</td>
<td>People or groups working against one another</td>
<td>People or groups working against one another</td>
<td></td>
</tr>
<tr>
<td></td>
<td>More than 1 person</td>
<td>Work shared only within competing groups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reward is shared among the group</td>
<td>Rewards are given to the best</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All members concerned about one another</td>
<td>Concerned only about yourself or your team</td>
<td></td>
</tr>
</tbody>
</table>

### Extensions
Consider how jobs are assigned within cooperative and competitive situations. Add information to your table as needed.

### Like Characteristics
- More than 1 person

### Like Categories
- How many people are involved

### Unlike Characteristics
- People working together against one another
- Works shared by all members of the group
- Rewards are shared
- All members concerned about one another

### Unlike Categories
- How people work together
- How work is shared
- Who gets the rewards
- Who you’re concerned about

### Summary
Make lists of known characteristics. Pin down like characteristics, assemble like categories, record unlike characteristics, identify unlike categories, and write down a summary.
## COMPARISON TABLE

<table>
<thead>
<tr>
<th>Concept</th>
<th>Characteristics</th>
<th>Extensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction</td>
<td>Represents parts of a whole, written with one number on top of a line and another below the line (e.g., 4/10). The number of parts contained in the whole is any number except zero.</td>
<td>Create two word problems, one involving fractions and the other involving decimals.</td>
</tr>
<tr>
<td>Decimal</td>
<td>Represents parts of a whole, written with one or more numbers and a decimal point (e.g., .4). The number of parts contained in the whole is 10 or any multiple of 10.</td>
<td>Use</td>
</tr>
</tbody>
</table>

### Summary

Two types of numerals are fractions and decimals. They are similar in their use (they are both used to represent parts of a whole). They are different in their written form and the number of parts contained in the whole.
### Comparison Table

<table>
<thead>
<tr>
<th>ELEMENTS OF LITERATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plot</strong></td>
</tr>
<tr>
<td>May be one or more in a work of literature</td>
</tr>
<tr>
<td>Found in narrative literature</td>
</tr>
<tr>
<td>Consists of a sequence of events</td>
</tr>
<tr>
<td>Provides entertainment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Theme</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>May be one or more in a work of literature</td>
</tr>
<tr>
<td>Found in a variety of literature</td>
</tr>
<tr>
<td>Consists of a statement about meaning</td>
</tr>
<tr>
<td>Delivers a message or idea</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Similar Characteristics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>May be one or more in a work of literature</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Unlike Characteristics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Found in narrative literature</td>
</tr>
<tr>
<td>Consists of a sequence of events</td>
</tr>
<tr>
<td>Provides entertainment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Unlike Characteristics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Found in a variety of literature</td>
</tr>
<tr>
<td>Consists of a statement about meaning</td>
</tr>
<tr>
<td>Delivers a message or idea</td>
</tr>
</tbody>
</table>

**Summary:**
Two elements of literature are plot and theme. They are alike in terms of the number used in any piece of literature (there may be more than one plot or theme in a piece of literature). They are different in their location in literature, the form they take, and the function they serve.