

**The
Concept
Comparison
Routine**

**The
Content Enhancement
Series**

**The University of Kansas
Center for Research on Learning
December, 1995**

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;**
- **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 to help students frame learning tasks:

**The Lesson Organizer Routine
The Chapter Survey Routine
The Unit Organizer Routine
The Course Launching Routine**

Routines to help students understand ideas:

**The Concept Mastery Routine
The Concept Anchoring Routine**

**THE CONCEPT COMPARISON
ROUTINE**

Routines to help students remember and respond:

The Recall Enhancement 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.

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.
- Develop ways to explain and summarize similarities and differences between concepts.
- Remember a way to compare and contrast known concepts.
- Interact with the teacher and other students to explore and understand relationships between concepts.
- Record information for later studying and use.

Supporting Research

- The Concept Comparison Routine was studied in secondary content-area classes (grades 7-11) characterized by diversity.
- In each study, teachers learned the Concept Comparison Routine easily, and student learning gains were observed by both teachers and researchers.
- Students with LD and other low-achieving students gained an average of 15 to 24 percentage points on tests or tasks that required students to demonstrate understanding of concept comparisons. Teachers continued using the routine after the studies were completed.
- These results were achieved when teachers:
 - (a) received 2-3 hours of instruction in the routine,
 - (b) had opportunities to discuss the routine with colleagues,
 - (c) spent the necessary time to plan and use the routine for more inclusive teaching,
 - (d) taught students how to participate in and use the routine,
 - and (e) used the routine regularly over time.

Components of the
**Concept Comparison
Routine**

The Comparison Table
Teaching Device

The COMPARING
Linking Steps

The
CUE-DO-REVIEW
Sequence

The Comparison Table

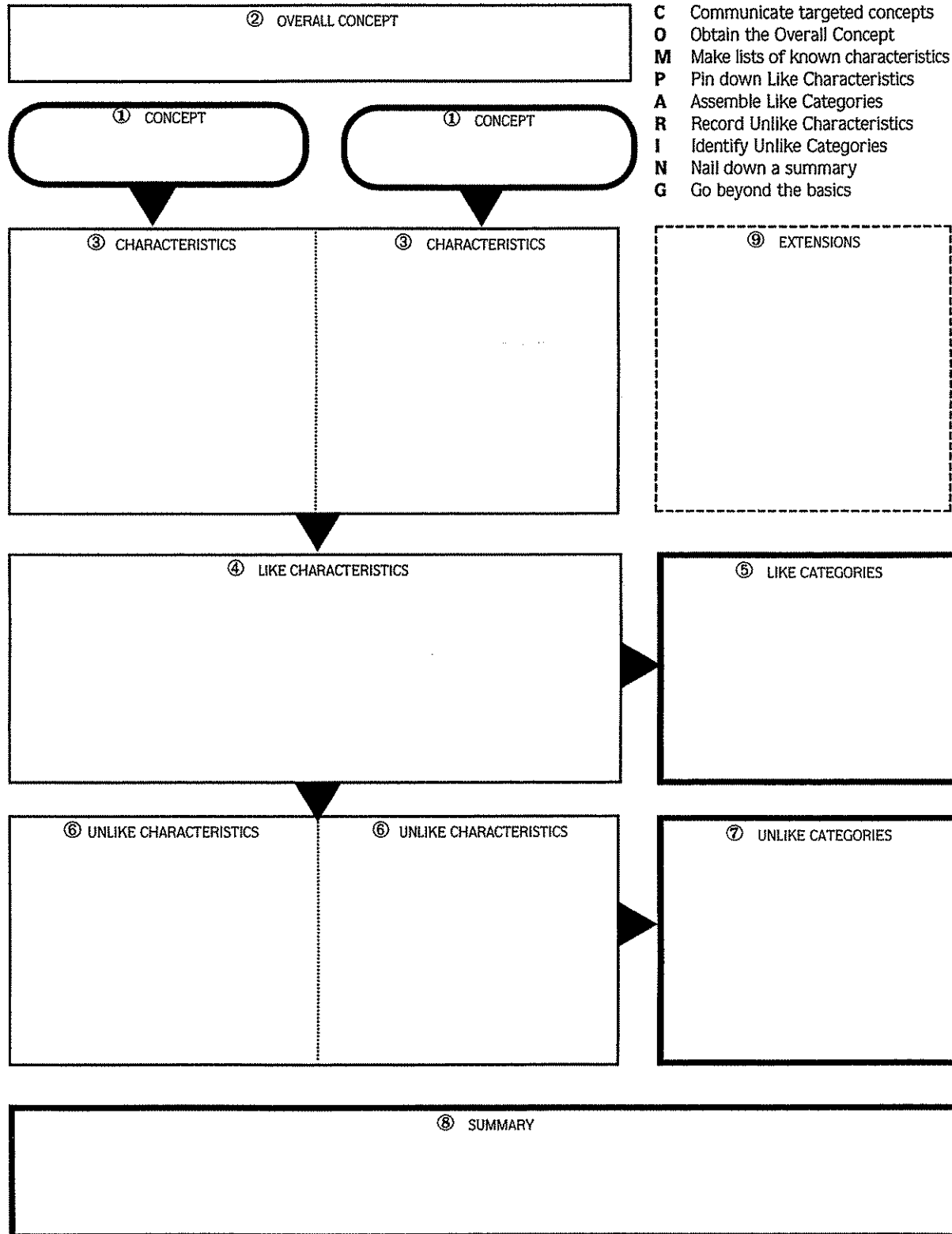
Teaching Device

Is a visual device that:

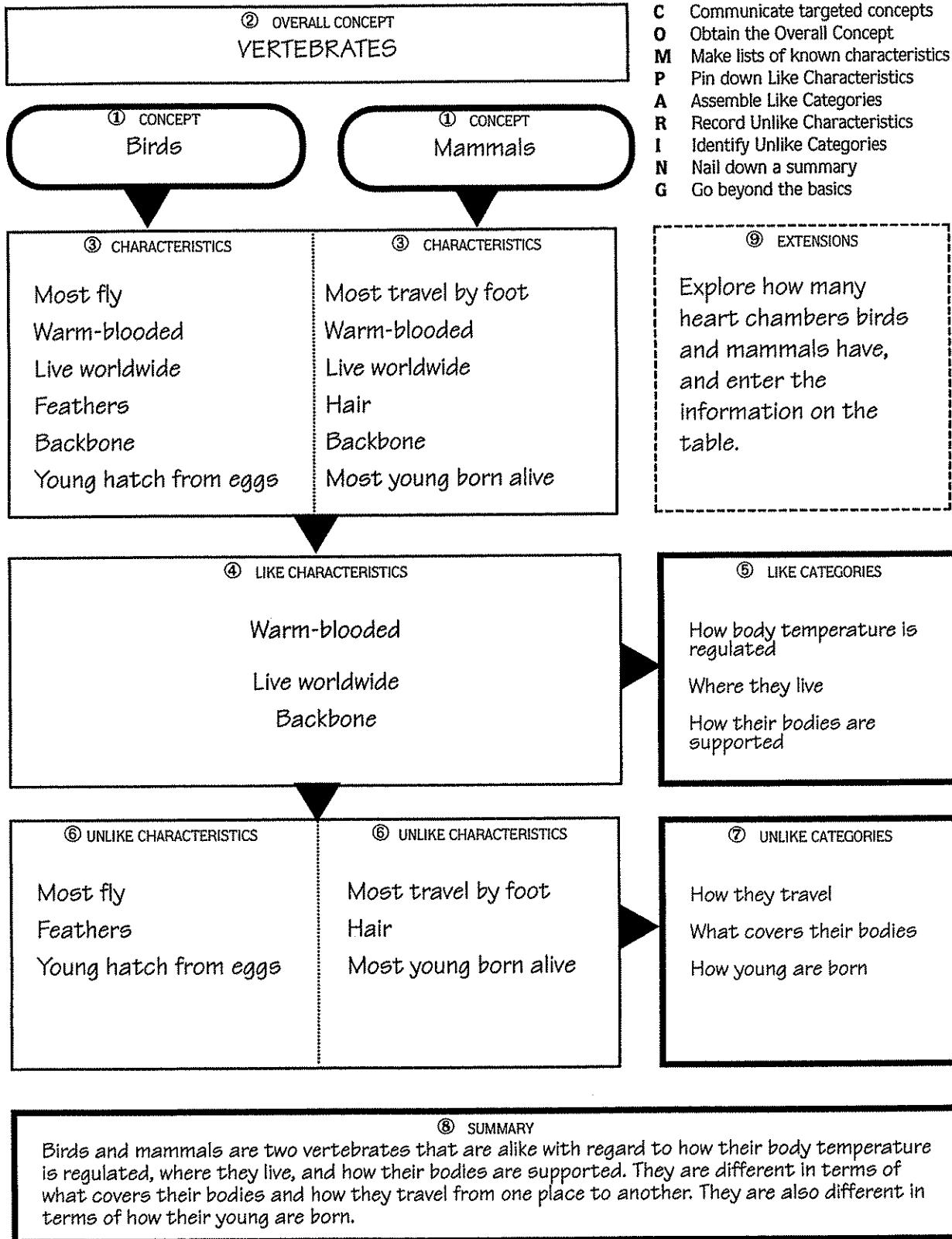
- is used under teacher guidance;
- focuses careful attention on more than one concept;
- identifies relevant features of each concept;
- prompts analysis of similarities and differences of relevant features;
- helps students summarize relationships between concepts;
- helps identify higher-order categories related to the relevant concepts;
- 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.

The Concept Comparison Teaching Device

COMPARISON TABLE

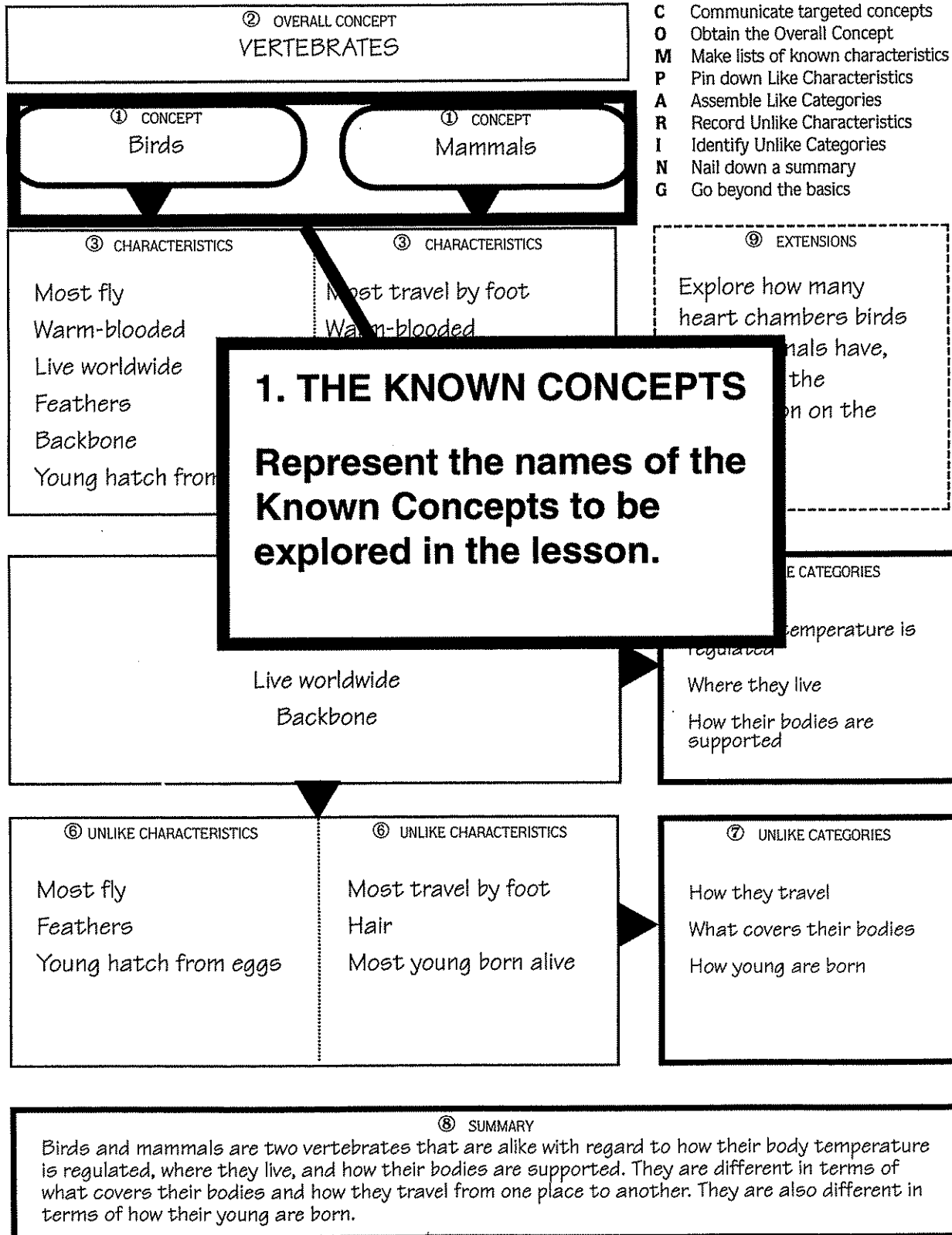


COMPARISON TABLE



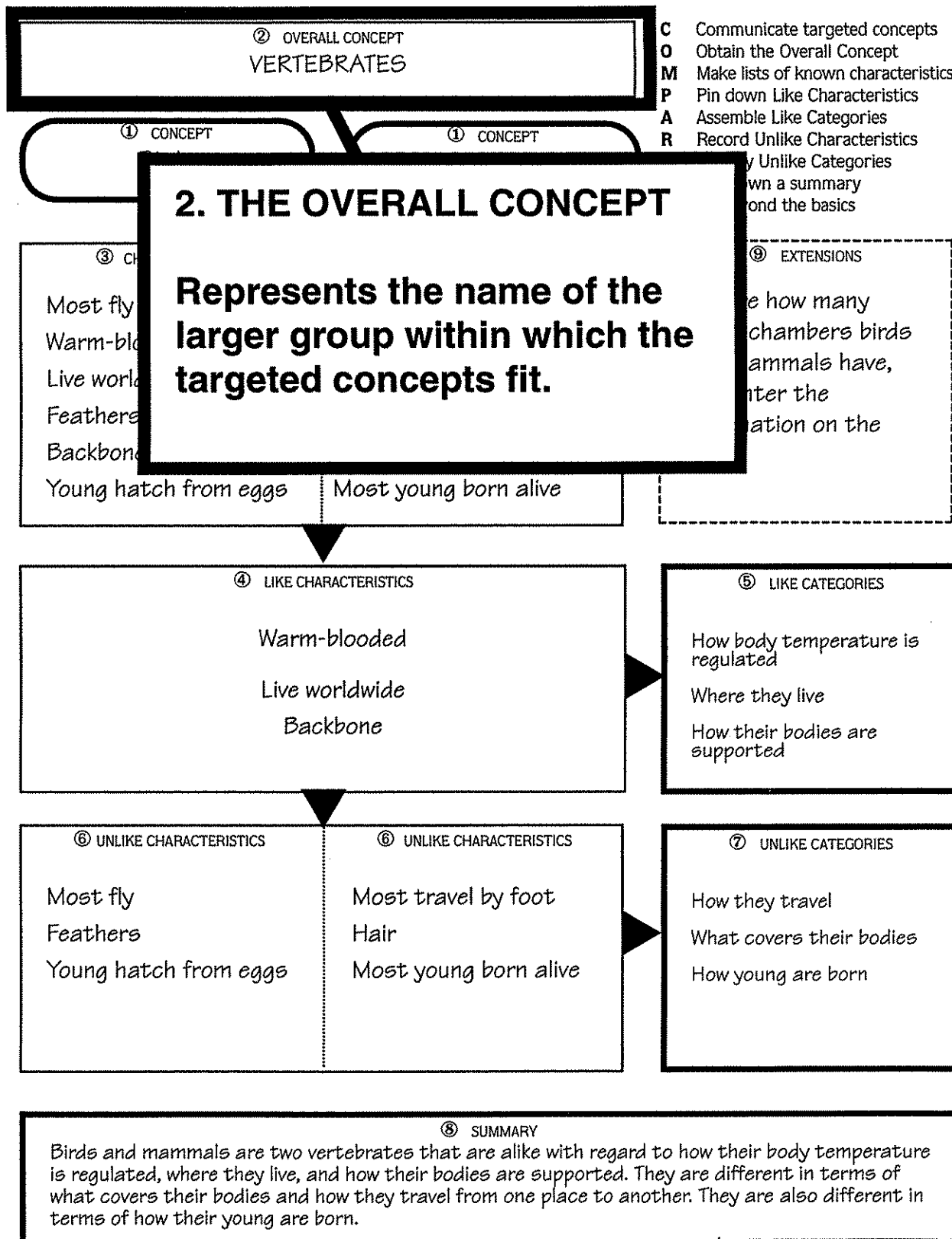
- C** Communicate targeted concepts
- O** Obtain the Overall Concept
- M** Make lists of known characteristics
- P** Pin down Like Characteristics
- A** Assemble Like Categories
- R** Record Unlike Characteristics
- I** Identify Unlike Categories
- N** Nail down a summary
- G** Go beyond the basics

COMPARISON TABLE

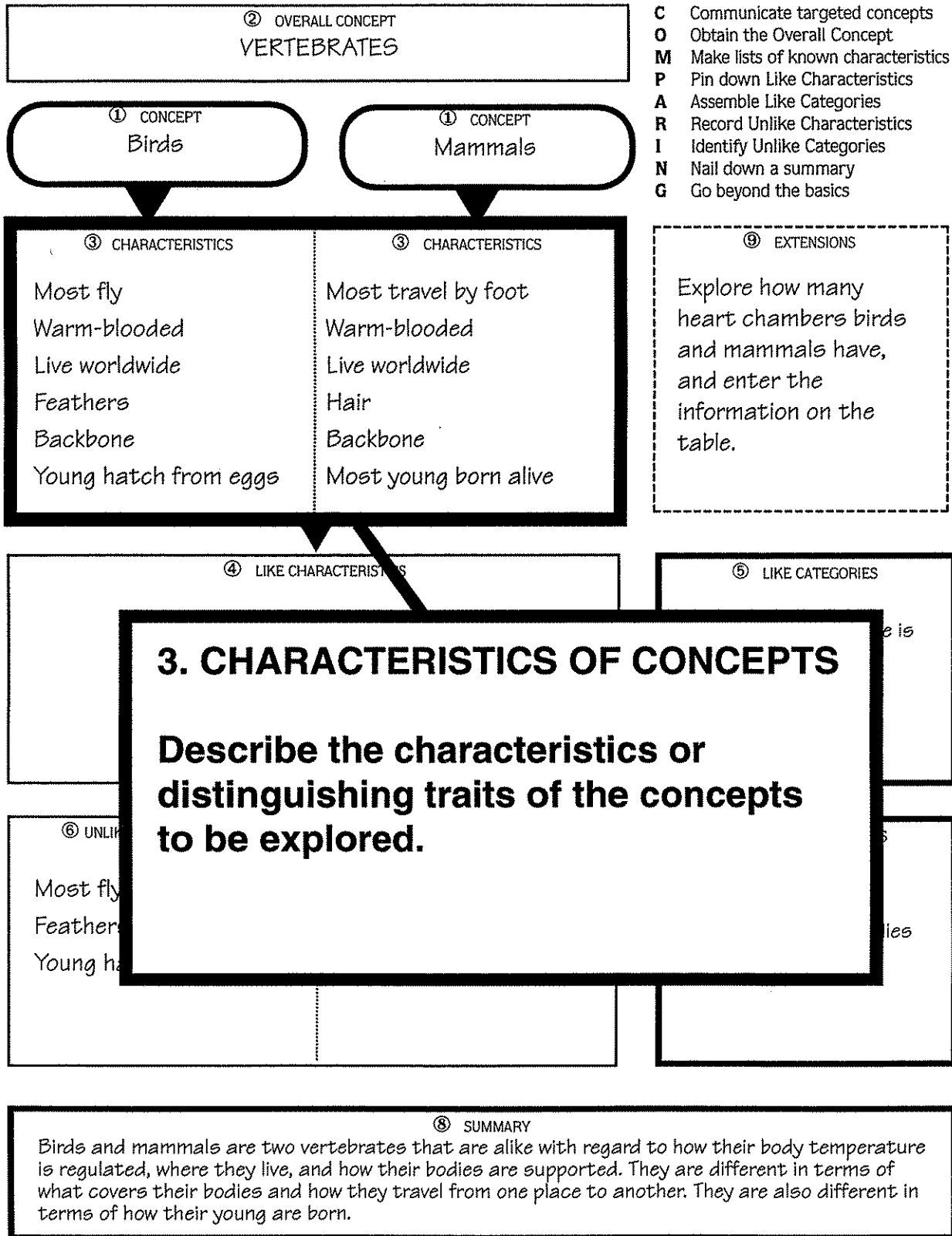


- C** Communicate targeted concepts
- O** Obtain the Overall Concept
- M** Make lists of known characteristics
- P** Pin down Like Characteristics
- A** Assemble Like Categories
- R** Record Unlike Characteristics
- I** Identify Unlike Categories
- N** Nail down a summary
- G** Go beyond the basics

COMPARISON TABLE



COMPARISON TABLE

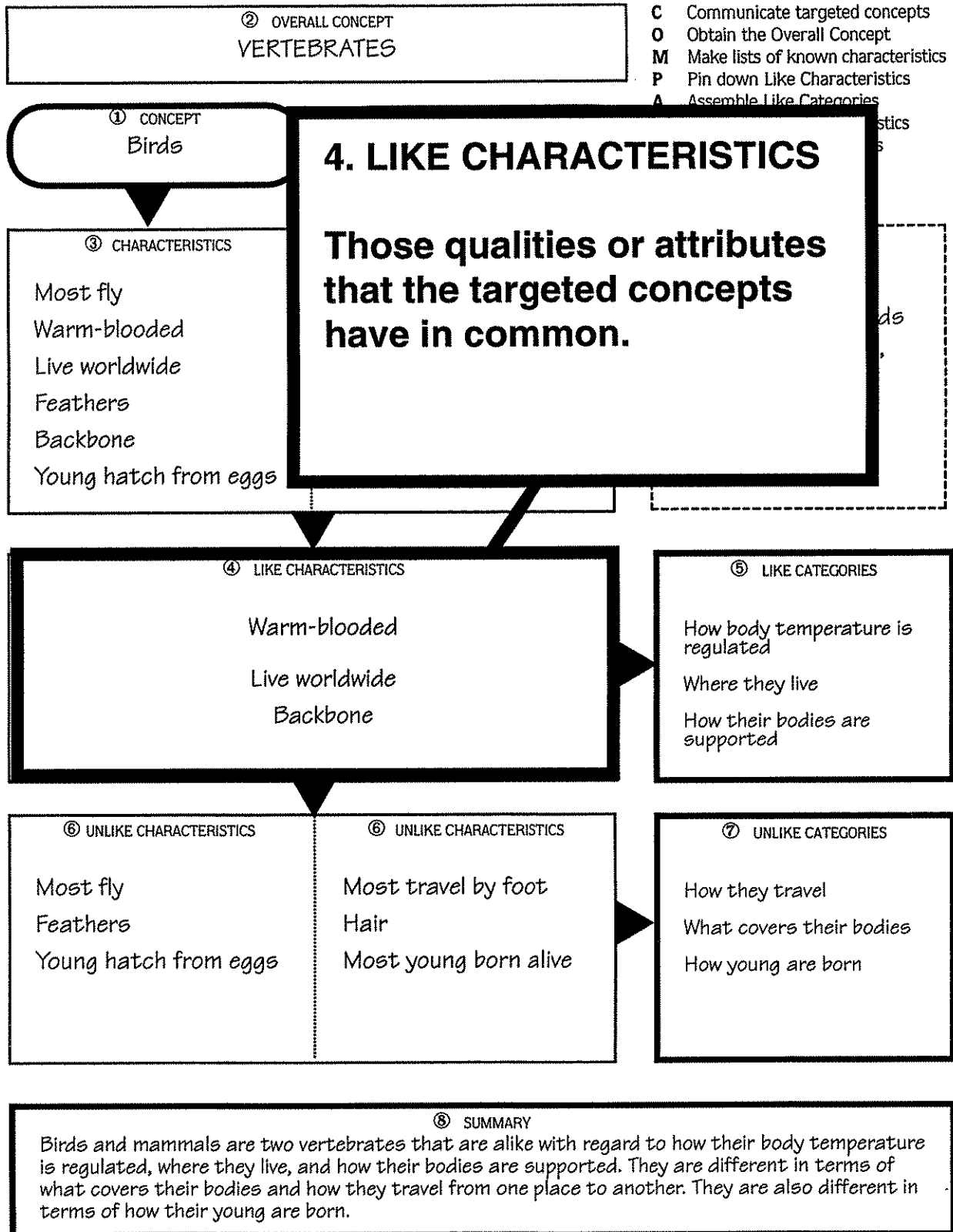


- C** Communicate targeted concepts
- O** Obtain the Overall Concept
- M** Make lists of known characteristics
- P** Pin down Like Characteristics
- A** Assemble Like Categories
- R** Record Unlike Characteristics
- I** Identify Unlike Categories
- N** Nail down a summary
- G** Go beyond the basics

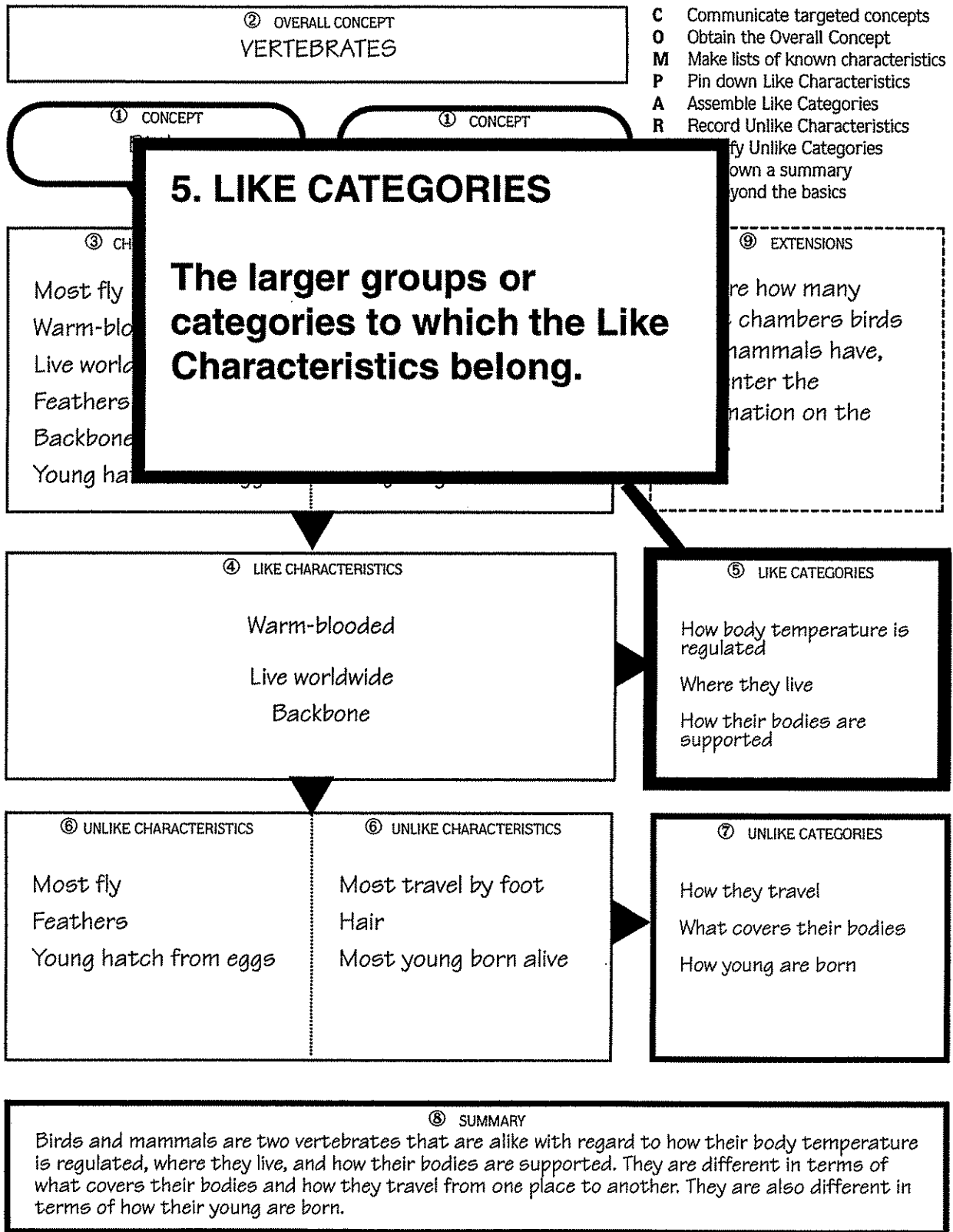
3. CHARACTERISTICS OF CONCEPTS

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

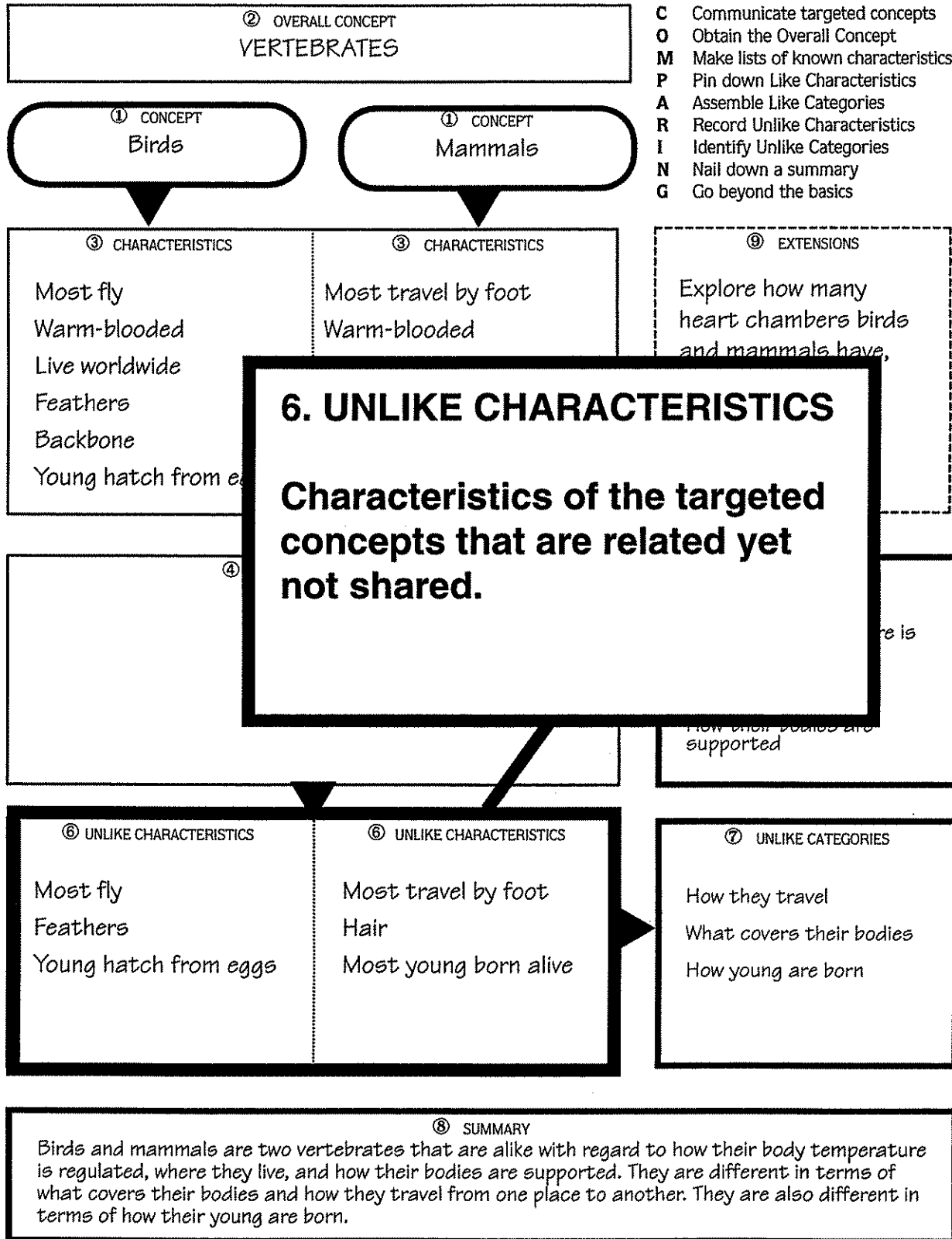
COMPARISON TABLE



COMPARISON TABLE

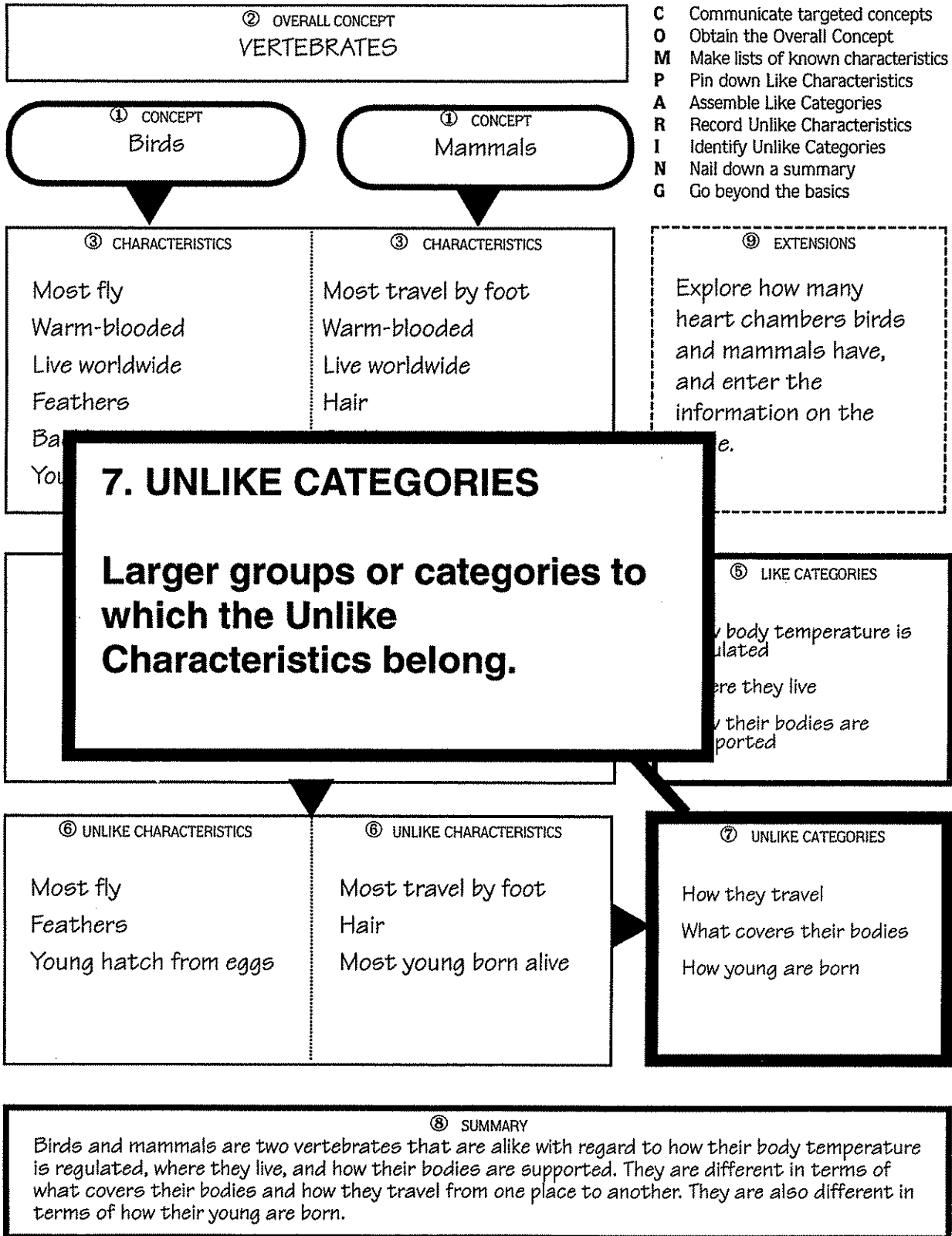


COMPARISON TABLE



- C** Communicate targeted concepts
- O** Obtain the Overall Concept
- M** Make lists of known characteristics
- P** Pin down Like Characteristics
- A** Assemble Like Categories
- R** Record Unlike Characteristics
- I** Identify Unlike Categories
- N** Nail down a summary
- G** Go beyond the basics

COMPARISON TABLE



- C** Communicate targeted concepts
- O** Obtain the Overall Concept
- M** Make lists of known characteristics
- P** Pin down Like Characteristics
- A** Assemble Like Categories
- R** Record Unlike Characteristics
- I** Identify Unlike Categories
- N** Nail down a summary
- G** Go beyond the basics

COMPARISON TABLE

<p>② OVERALL CONCEPT</p>	<p>C Communicate targeted concepts O Obtain the Overall Concept</p>
<p>① CONCEPT Birds</p>	<h2>8. SUMMARY</h2> <p>An understanding of the similarities and differences between concepts that can either:</p> <ul style="list-style-type: none"> ■ 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.
<p>③ CHARACTERISTICS</p> <p>Most fly Warm-blooded Live worldwide Feathers Backbone Young hatch from</p>	<p>characteristics eristics ies eristics ries</p>
<p>④ LIKE CHARACTERISTICS</p>	<p>y birds ve, e</p>
<p>⑥ UNLIKE CHARACTERISTICS</p> <p>Most fly Feathers Young hatch from</p>	<p>ES ure is e RIES odies</p>
<p>⑧ SUMMARY</p> <p>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.</p>	

COMPARISON TABLE

② OVERALL CONCEPT
VERTEBRATES

① CONCEPT
Birds

① CONCEPT
Mammals

- C Communicate targeted concepts
- O Obtain the Overall Concept
- M Make lists of known characteristics
- P Pin down Like Characteristics
- A Assemble Like Categories
- R Record Unlike Characteristics
- I Identify Unlike Categories
- N Nail down a summary
- G Go beyond the basics

③ CHARACTERISTICS	③ CHARACTERISTICS
Most fly	Most travel by foot
Warm-blooded	Warm-blooded
Live worldwide	Live worldwide
Feathers	Hair
Backbone	Backbone
Young hatch from eggs	Most young born alive

⑨ EXTENSIONS
Explore how many heart chambers birds and mammals have, and enter the information on the table.

9. EXTENSIONS

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

<p>⑥ UNLIKE CHARACT</p> <p>Most fly Feathers Young hatch from eggs</p>	<p>Most young born alive</p>
--	------------------------------

How young are born

⑧ 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.

The COMPARING Linking Steps

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

1. **C**ommunicate Targeted Concepts.
2. **O**btain the Overall Concept.
3. **M**ake Lists of Known Characteristics.
4. **P**in Down Like Characteristics.
5. **A**ssemble Like Categories.
6. **R**ecord Unlike Characteristics.
7. **I**dentify Unlike Categories.
8. **N**ail Down a Summary.
9. **G**o Beyond the Basics.

COMPARISON TABLE

② OVERALL CONCEPT
VERTEBRATES

① CONCEPT
Birds

① CONCEPT
Mammals

- C Communicate targeted concepts
- O Obtain the Overall Concept
- M Make lists of known characteristics
- P Pin down Like Characteristics
- A Assemble Like Categories
- R Record Unlike Characteristics
- I Identify Unlike Categories
- N Nail down a summary
- G Go beyond the basics

③ CHARACTERISTICS

③ CHARACTERISTICS

⑨ EXTENSIONS

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.

Most fly	Most travel by foot
Feathers	Hair
Young hatch from eggs	Most young born alive

How they travel
What covers their bodies
How young are born

⑧ 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.

The CUE-DO-REVIEW Sequence

The overall instructional process that guides use of the Comparison Table and COMPARING Linking Steps.

This instructional process involves:

- **CUE** The teacher announces the Comparison Table and explains its use and expectations for student participation.

- **DO** The teacher and class collaboratively construct the device using the COMPARING Linking Steps that “connect” the content to the needs and goals of students.

- **REVIEW** Information presented in the Comparison Table is reviewed and confirmed, and the process of exploring similarities and differences between concepts is reviewed.

Get Ready!

- **Select content for the routine (p. 20).**
- **Decide when to use the routine (p. 20)**
- **Collect materials and ideas (p. 22).**
- **Construct a draft (p. 22).**
 1. **Enter the names of the targeted concept (p. 22).**
 2. **Enter the name of the Overall Concept (p. 24).**
 3. **Draft lists of Known Characteristics (p. 24).**
 4. **Identify Like Characteristics (p. 25).**
 5. **Create names for the Like Categories (p. 25).**
 6. **Identify characteristics that are related yet not shared (p. 26).**
 7. **Create names of Unlike Categories (p. 27).**
 8. **Create a summary (p. 27).**
 9. **Prepare to extend students' understanding (p. 27).**

Questions to Aid the Concept Selection Process

- Abstractness** Which concepts are abstract and, therefore, especially difficult to understand?
- Organization** Which pairs or groups of concepts are critical to the understanding of other concepts?
- Relevance** Which related concepts are so important that the students must understand them and how they are alike and different if they are to benefit from the course?
- Interest** Which concepts may not seem very interesting to students and, therefore, require special attention?
- Preparation** Which concepts are foundational for information that will be covered later in the course (i.e., which concepts prepare students for mastering information)?
- Complexity** Which concepts are difficult to understand because of their complexity (e.g., which ones have numerous characteristics)?
- Quantity** Where are so many concepts mentioned that they must be organized and highlighted through comparing and contrasting?

COMPARISON TABLE

② OVERALL CONCEPT
ECONOMIC CAUSES OF SECTIONALISM IN THE U.S.

① CONCEPT
Economic conditions in the North in 1860

① CONCEPT
Economic conditions in the South in 1860

③ CHARACTERISTICS	③ CHARACTERISTICS
Good ports	Good ports
Good natural resources	Good natural resources
Immigrants in labor force	Slaves in labor force
Profit from industries	Profit from growing cotton
Good land transportation	Poor land transportation
Good credit with other countries	Good credit with other countries

⑨ EXTENSIONS
Study the economic conditions of the West in 1860, and create a list of characteristics to be compared to the North & South.

④ LIKE CHARACTERISTICS
Good ports
Good natural resources
Good credit with other countries

⑤ LIKE CATEGORIES
Quality of ports
Quality of natural resources
Quality of credit

⑥ UNLIKE CHARACTERISTICS	⑥ UNLIKE CHARACTERISTICS
Immigrants in labor force	Slaves in labor force
Profit from industries	Profit from growing cotton
Good land transportation	Poor land transportation

⑦ UNLIKE CATEGORIES
Primary source of labor
Source of profits
Quality of land transportation

⑧ 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.

- C Communicate targeted concepts
- O Obtain the Overall Concept
- M Make lists of known characteristics
- P Pin down Like Characteristics
- A Assemble Like Categories
- R Record Unlike Characteristics
- I Identify Unlike Categories
- N Nail down a summary
- G Go beyond the basics

Checking the Names of the Overall & Targeted Concepts

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).”

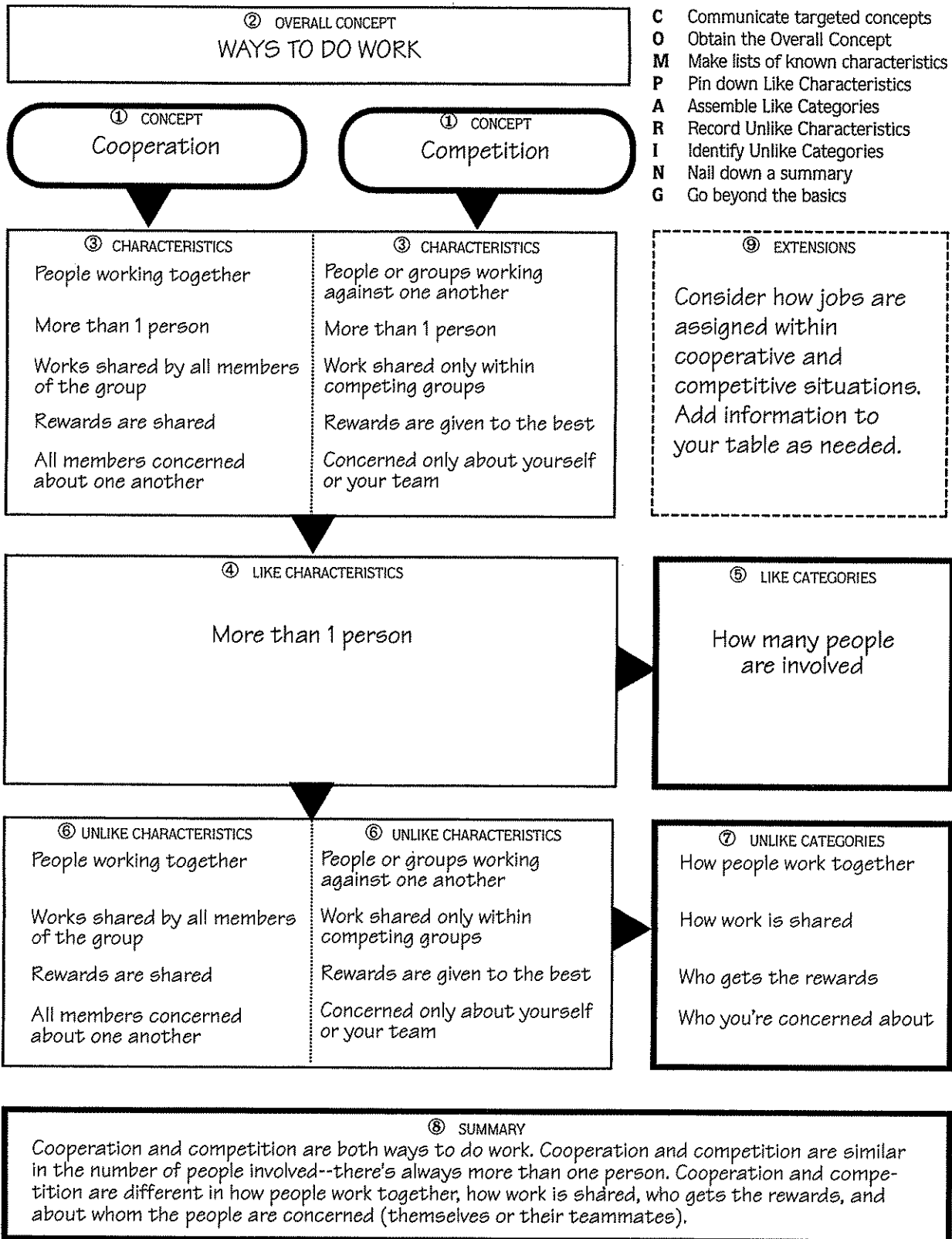
“Fish and mammals (concepts being compared) are two kinds of vertebrates (Overall Concept).”

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

Get Set!

- Choose lesson material (p. 28).
- Introduce the Comparison Table (p. 28).
- Describe how you will CUE the routine (p. 30).
- Describe and model how you will DO the routine (p. 31).
- Explain how you will REVIEW the information on the Comparison Table (p. 34).
- Explain how you will debrief (p. 35).

COMPARISON TABLE



- C** Communicate targeted concepts
- O** Obtain the Overall Concept
- M** Make lists of known characteristics
- P** Pin down Like Characteristics
- A** Assemble Like Categories
- R** Record Unlike Characteristics
- I** Identify Unlike Categories
- N** Nail down a summary
- G** Go beyond the basics

Go!

- Use the routine explicitly (p. 36).
- Build thinking skills (p. 36).
- Build continuity (p. 36).
- Evaluate your use of the routine (p. 37).
- Be creative (p. 37).
- Beware of pitfalls (p. 40).

Concept Comparison Table

BIGGER CONCEPT	
_____	_____
SMALLER CONCEPT	SMALLER CONCEPT

CHARACTERISTICS OF THIS CONCEPT

CHARACTERISTICS OF THIS CONCEPT

CHARACTERISTICS THAT ARE ALIKE

LIKE CATEGORIES



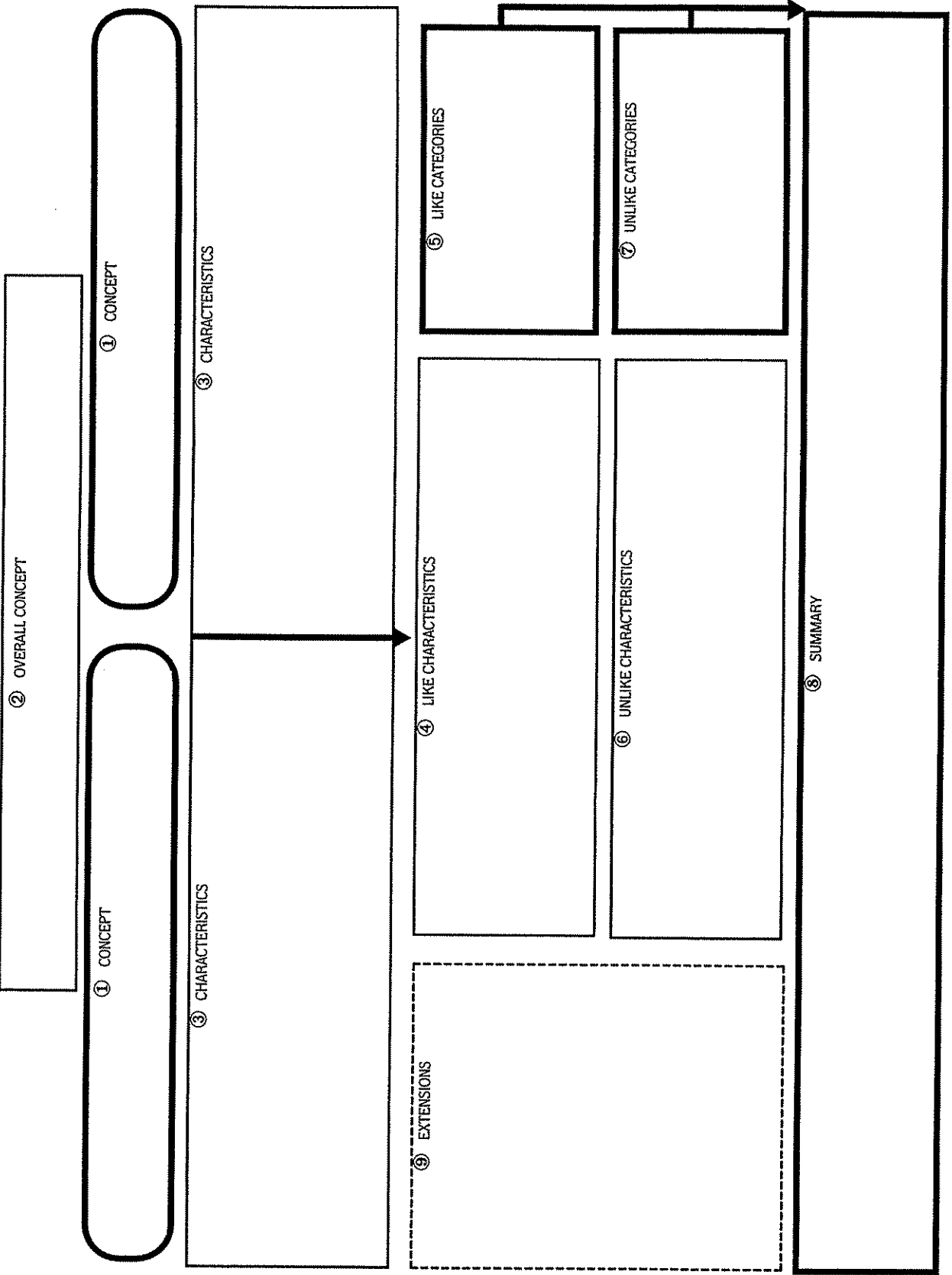
CHARACTERISTICS THAT ARE DIFFERENT

DIFFERENT CATEGORIES

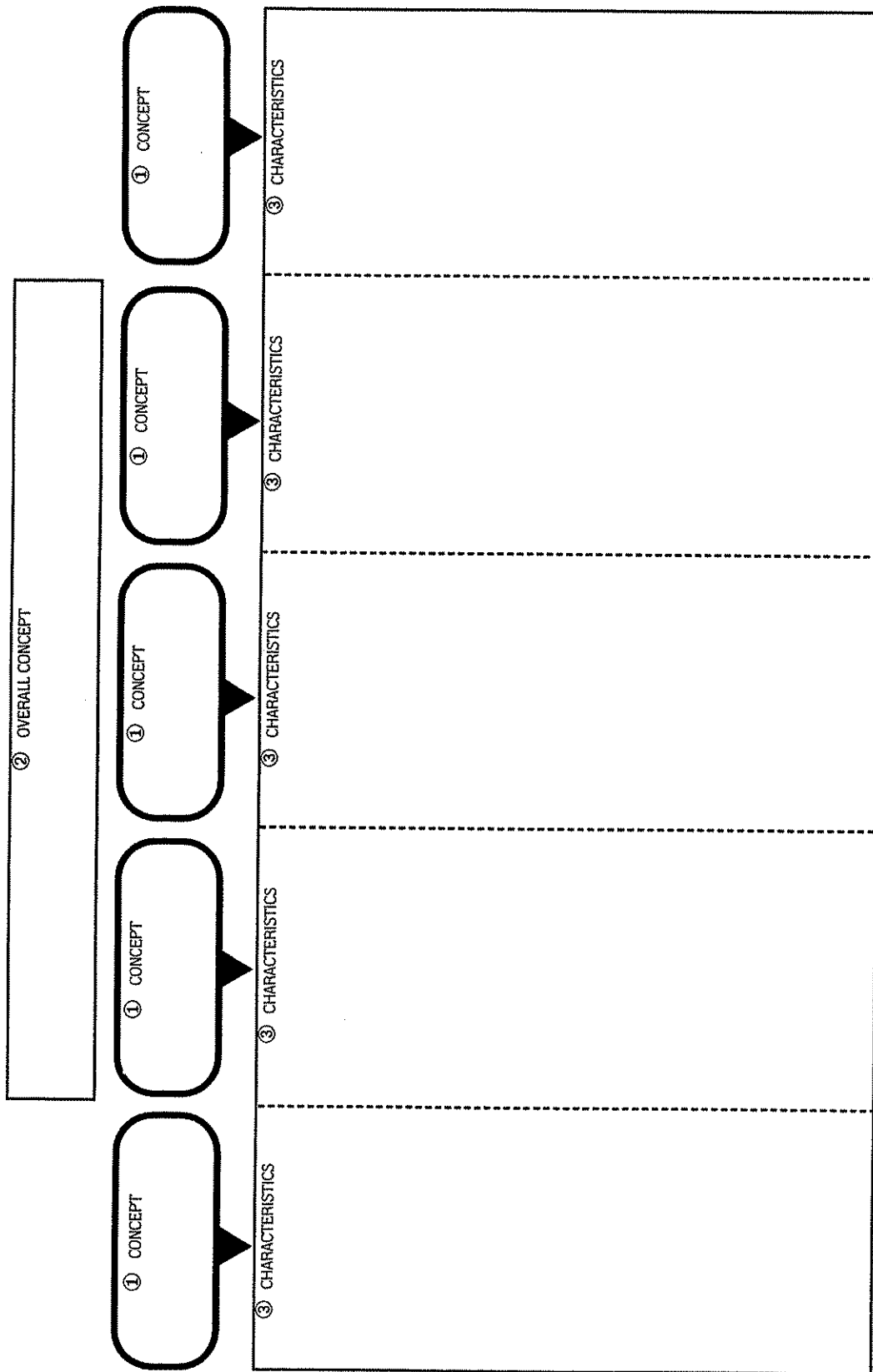


TELL HOW THE CONCEPTS ARE ALIKE AND DIFFERENT

COMPARISON TABLE



MULTIPLE-CONCEPT COMPARISON TABLE, p. 1



STEPS 1-3 OF THE CONCEPT COMPARISON ROUTINE

Step 1: Communicate targeted concepts

Step 2: Obtain the Overall Concept

Step 3: Make lists of known characteristics

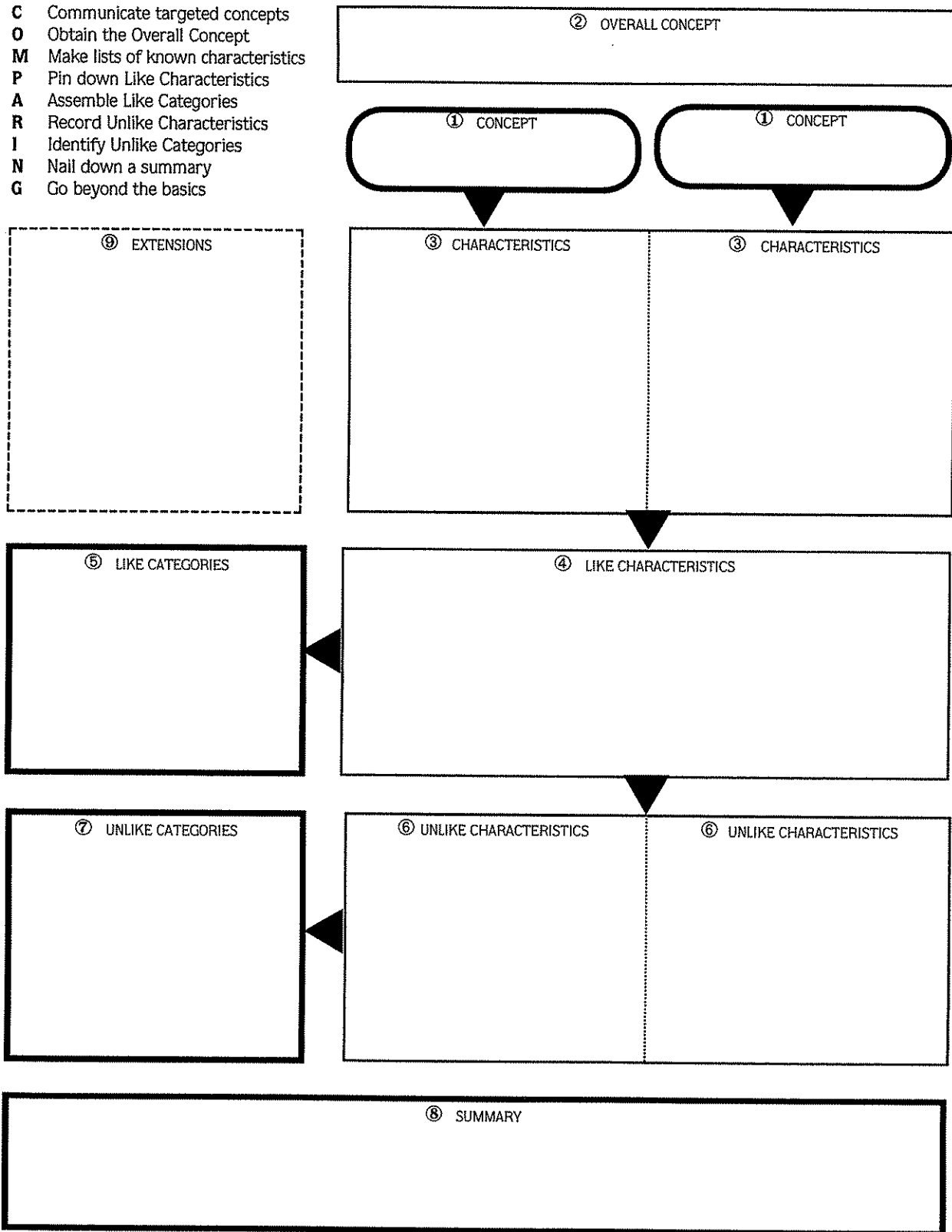
MULTIPLE-CONCEPT COMPARISON TABLE, p. 2

CONCEPT	CONCEPT	CONCEPT	CONCEPT	CONCEPT
④ Like Characteristics	④ Like Characteristics	④ Like Characteristics	④ Like Characteristics	⑤ LIKE CATEGORIES
⑤ Unlike Characteristics	⑤ Unlike Characteristics	⑤ Unlike Characteristics	⑤ Unlike Characteristics	⑦ UNLIKE CATEGORIES
⑥ SUMMARY				⑧ EXTENSIONS

- Steps 4-9 of the Concept Comparison Routine**
- Step 4: Pin down Like Characteristics
 - Step 5: Assemble Like Categories
 - Step 6: Record Unlike Characteristics
 - Step 7: Identify Unlike Categories
 - Step 8: Nail down a summary
 - Step 9: Go beyond the basics

COMPARISON TABLE

- C** Communicate targeted concepts
- O** Obtain the Overall Concept
- M** Make lists of known characteristics
- P** Pin down Like Characteristics
- A** Assemble Like Categories
- R** Record Unlike Characteristics
- I** Identify Unlike Categories
- N** Nail down a summary
- G** Go beyond the basics



Presentation Checks

- Is the Comparison Table large enough to see from the back of the classroom?
- Are all the words legible?
- Are characteristics and categories presented in a parallel fashion, e.g., all sentences or all parallel phrases?
- If phrases are used, is there a common stem so students can reconstruct the meaning on their own?
- Have students been cued to take notes on the Comparison Table?
- Do students understand each part of the Comparison Table?
- Have you checked student understanding of the higher-order categories on the Comparison Table?
- Have you checked for student understanding of the process involved in developing the Comparison Table?
- Have you made sure students know how to demonstrate understanding of the comparisons?
- Have you checked for student understanding of the extensions?

Win!

STUDENTS WIN!

- Check whether students are learning what they are supposed to be learning.
- Check whether students are personally satisfied with what and how they are learning.
- Check whether students' grades reflect how much they have learned.

YOU WIN!

- Select a "growth target"
- Choose a way to learn
- Choose a support system
- Plan for confidence building
- Debug
- Maximize the challenge
- Take ownership of the routine

APPENDICES – TABLE OF CONTENTS

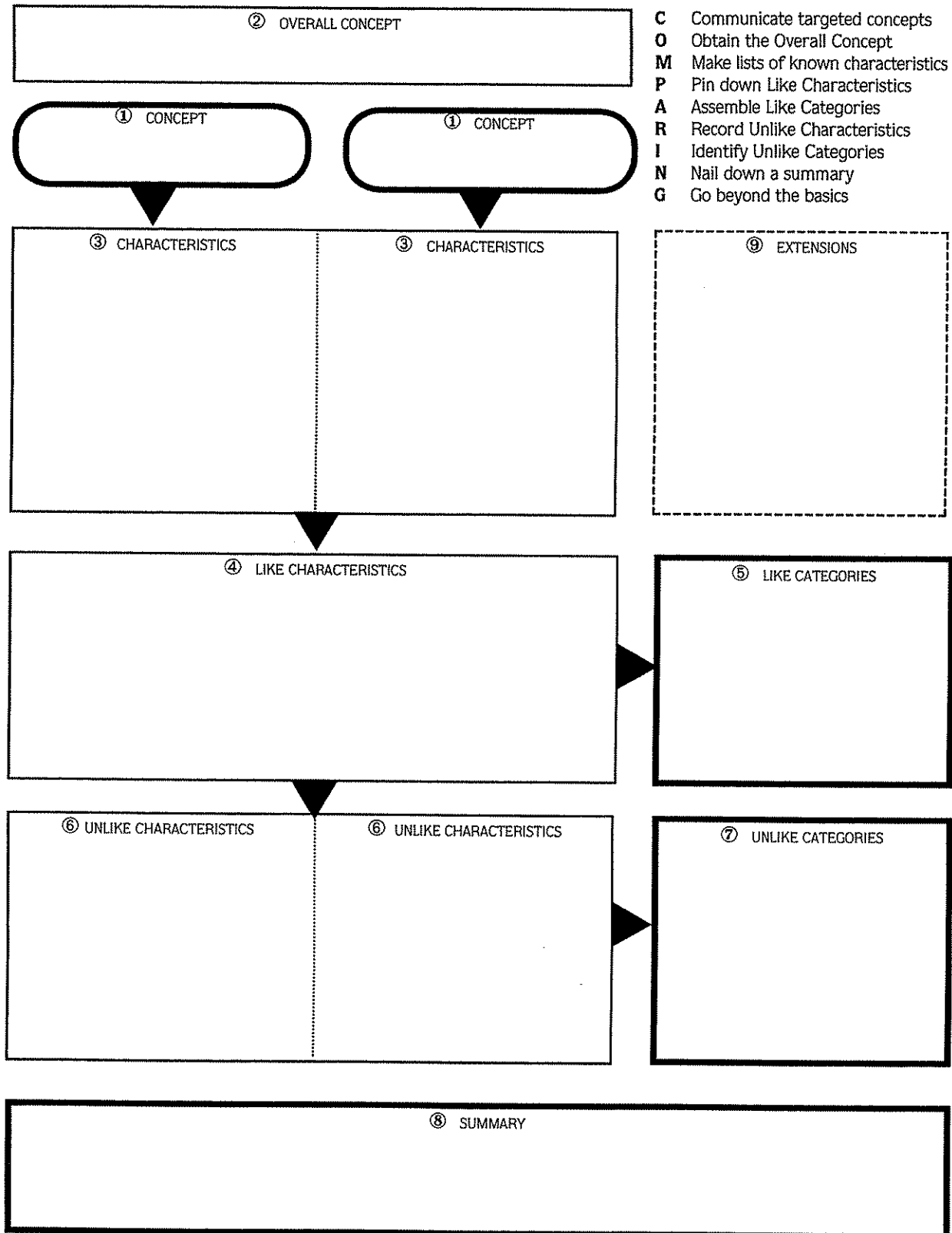
Appendix A--Instructional Forms

Comparison Table (<i>Categories on right side</i>)	46
Comparison Table (<i>Categories on left side</i>)	47
Comparison Table (<i>Horizontal version</i>)	48
Multiple-Concept Comparison Table	49-50
Comparison Table (<i>Simplified version</i>).....	51

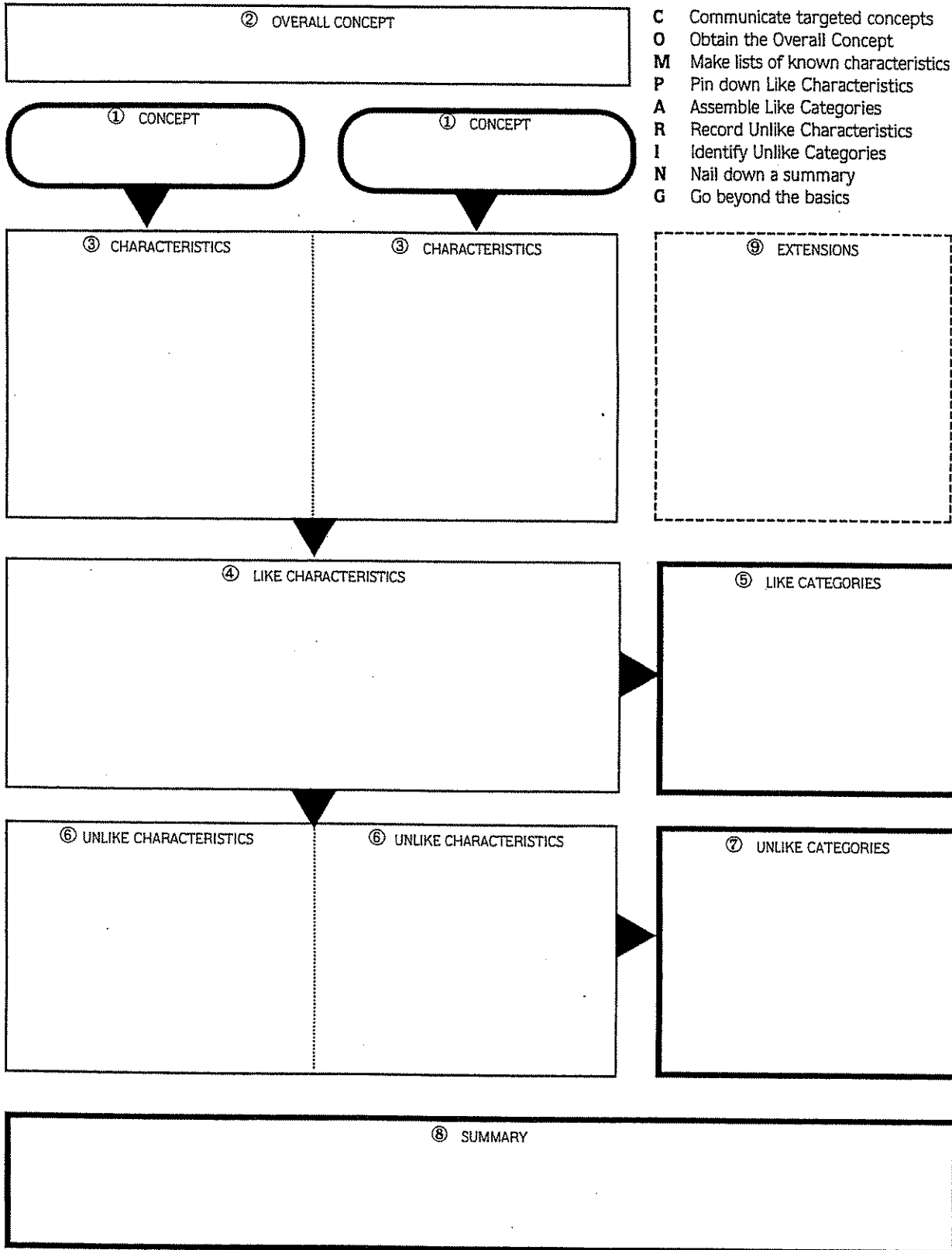
Appendix B--Examples

Comparison Table: Birds & Mammals	52
Comparison Table: Economic conditions in the North & South	53
Comparison Table: Cooperation & Competition	54
Comparison Table: Fractions & Decimals	55
Comparison Table: Plot & Theme	56

COMPARISON TABLE

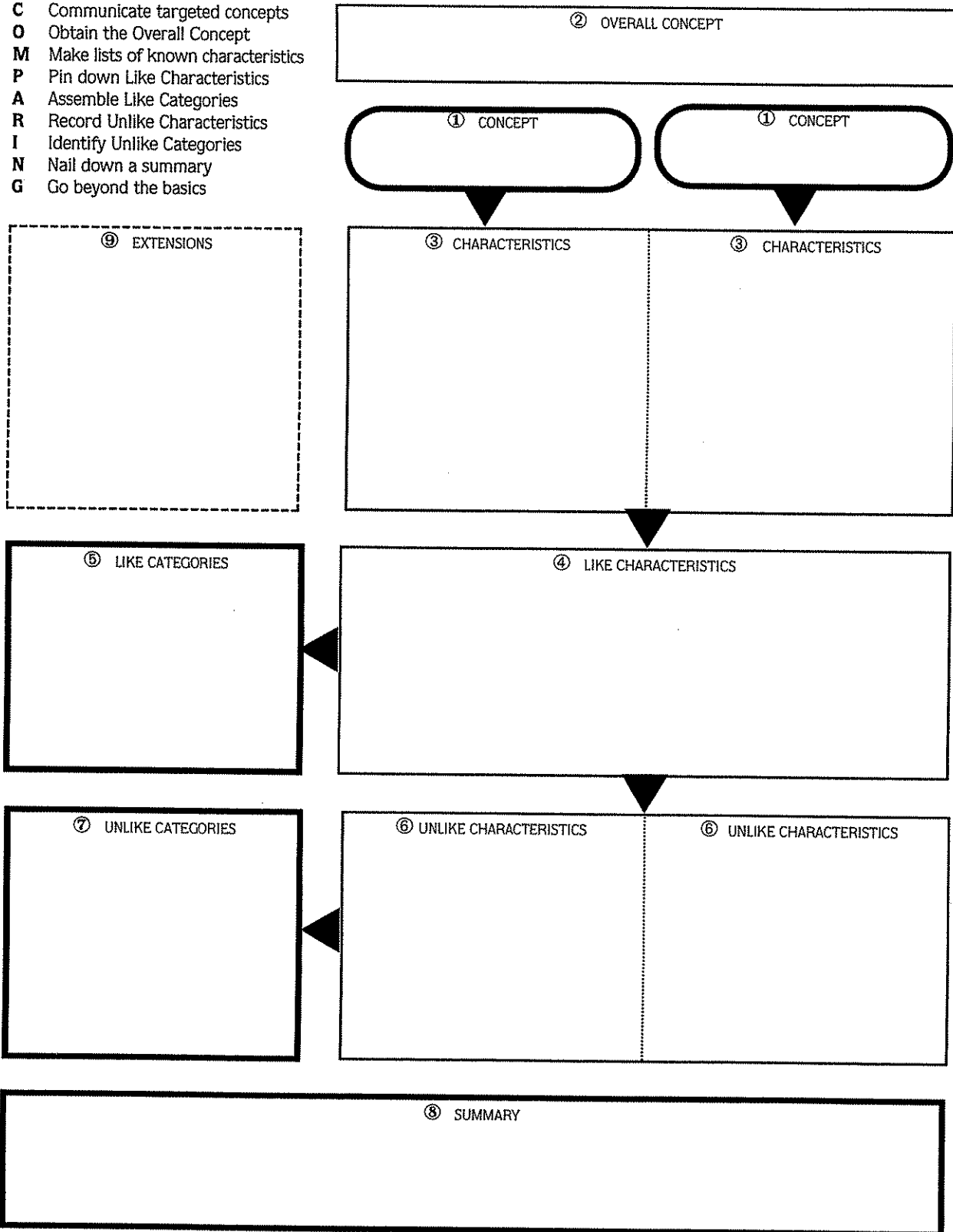


COMPARISON TABLE



COMPARISON TABLE

- C** Communicate targeted concepts
- O** Obtain the Overall Concept
- M** Make lists of known characteristics
- P** Pin down Like Characteristics
- A** Assemble Like Categories
- R** Record Unlike Characteristics
- I** Identify Unlike Categories
- N** Nail down a summary
- G** Go beyond the basics



COMPARISON TABLE

② OVERALL CONCEPT

① CONCEPT

① CONCEPT

③ CHARACTERISTICS

③ CHARACTERISTICS

④ EXTENSIONS

④ LIKE CHARACTERISTICS

⑥ UNLIKE CHARACTERISTICS

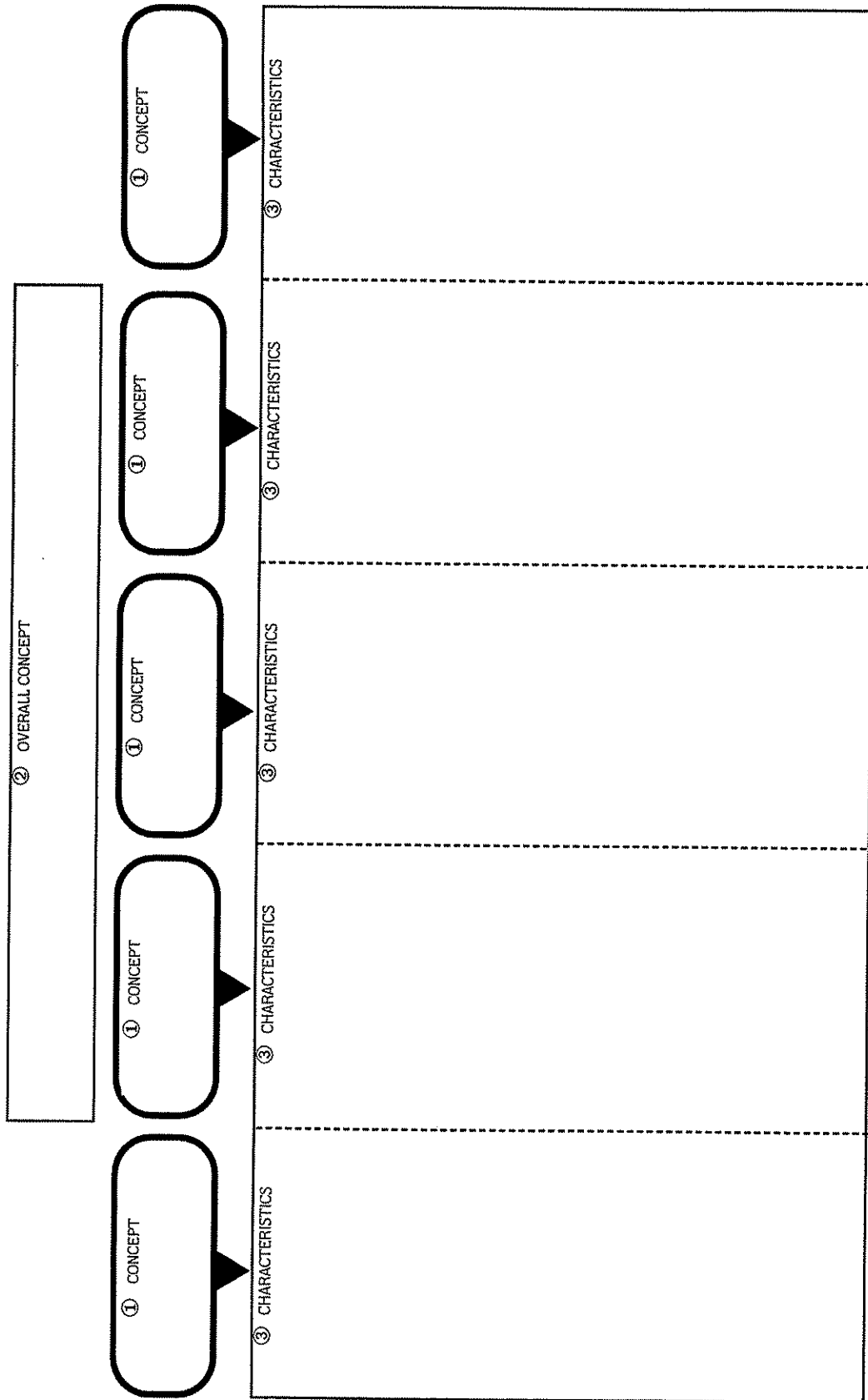
⑤ LIKE CATEGORIES

⑦ UNLIKE CATEGORIES

⑧ SUMMARY

- Step 1: Communicate targeted concepts
- Step 2: Obtain Overall Concept
- Step 3: Make lists of known characteristics
- Step 4: Pin down Like Characteristics
- Step 5: Assemble Like Categories
- Step 6: Record Unlike Characteristics
- Step 7: Identify Unlike Categories
- Step 8: Nail down a summary
- Step 9: Go beyond the basics

MULTIPLE-CONCEPT COMPARISON TABLE, p. 1



STEPS 1-3 OF THE CONCEPT COMPARISON ROUTINE

Step 1: Communicate targeted concepts

Step 2: Obtain the Overall Concept

Step 3: Make lists of known characteristics

MULTIPLE-CONCEPT COMPARISON TABLE, p. 2

CONCEPT	CONCEPT	CONCEPT	CONCEPT	CONCEPT
④ Like Characteristics	④ Like Characteristics	④ Like Characteristics	④ Like Characteristics	⑤ LIKE CATEGORIES
⑥ Unlike Characteristics	⑥ Unlike Characteristics	⑥ Unlike Characteristics	⑥ Unlike Characteristics	⑦ UNLIKE CATEGORIES
⑧ SUMMARY				⑨ EXTENSIONS

- Steps 4-9 of the Concept Comparison Routine**
- Step 4: Pin down Like Characteristics
 - Step 5: Assemble Like Categories
 - Step 6: Record Unlike Characteristics
 - Step 7: Identify Unlike Categories
 - Step 8: Nail down a summary
 - Step 9: Go beyond the basics

Concept Comparison Table

BIGGER CONCEPT	
SMALLER CONCEPT	SMALLER CONCEPT

CHARACTERISTICS OF THIS CONCEPT

CHARACTERISTICS OF THIS CONCEPT

CHARACTERISTICS THAT ARE ALIKE

LIKE
CATEGORIES



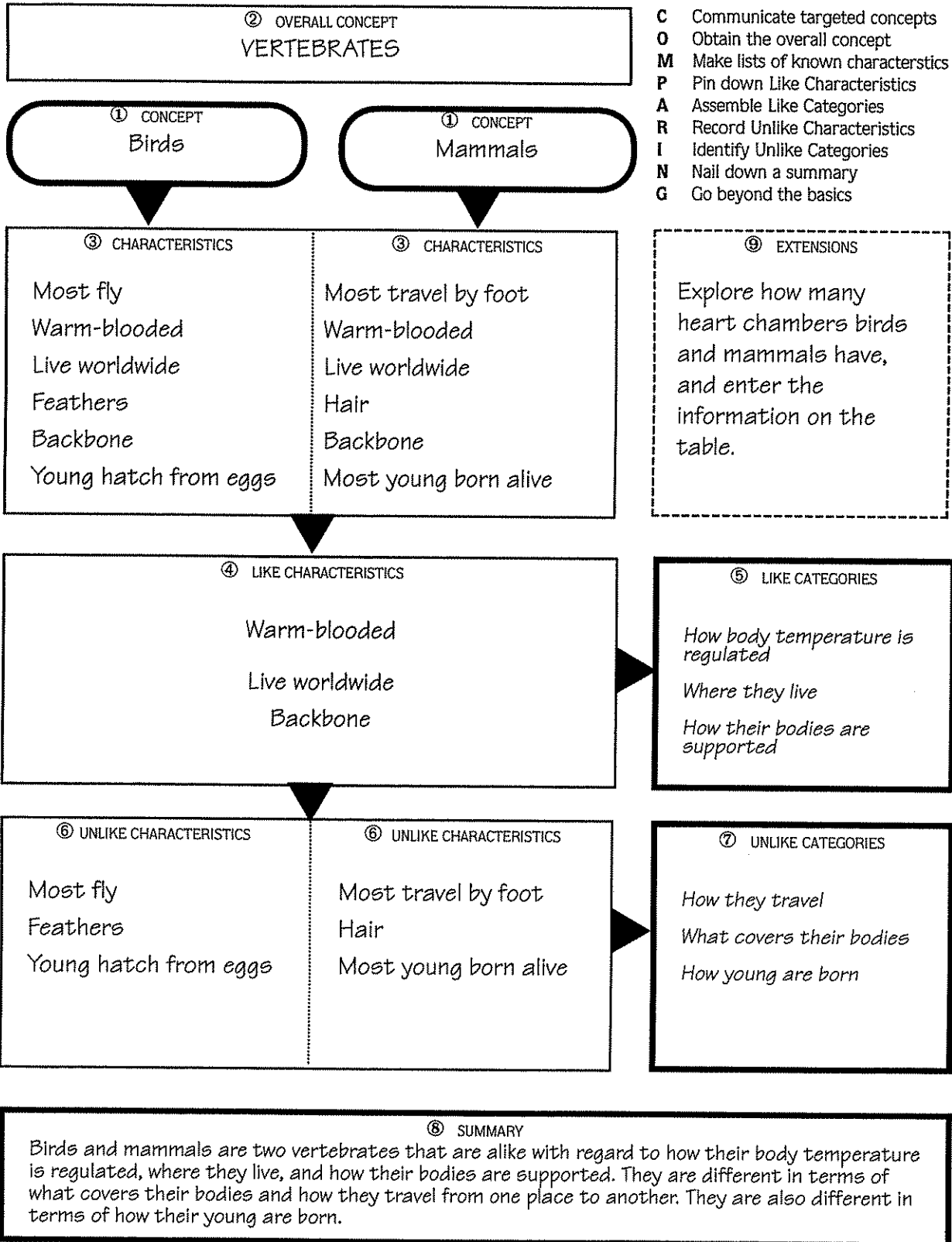
CHARACTERISTICS THAT ARE DIFFERENT

DIFFERENT
CATEGORIES



TELL HOW THE CONCEPTS ARE ALIKE AND DIFFERENT

COMPARISON TABLE



COMPARISON TABLE

② OVERALL CONCEPT
ECONOMIC CAUSES OF SECTIONALISM IN THE U.S.

① CONCEPT
Economic conditions in the North in 1860

① CONCEPT
Economic conditions in the South in 1860

③ CHARACTERISTICS	③ CHARACTERISTICS
Good ports	Good ports
Good natural resources	Good natural resources
Immigrants in labor force	Slaves in labor force
Profit from industries	Profit from growing cotton
Good land transportation	Poor land transportation
Good credit with other countries	Good credit with other countries

⑨ EXTENSIONS
Study the economic conditions of the West in 1860, and create a list of characteristics to be compared to the North & South.

④ LIKE CHARACTERISTICS
Good ports
Good natural resources
Good credit with other countries

⑤ LIKE CATEGORIES
Quality of ports
Quality of natural resources
Quality of credit

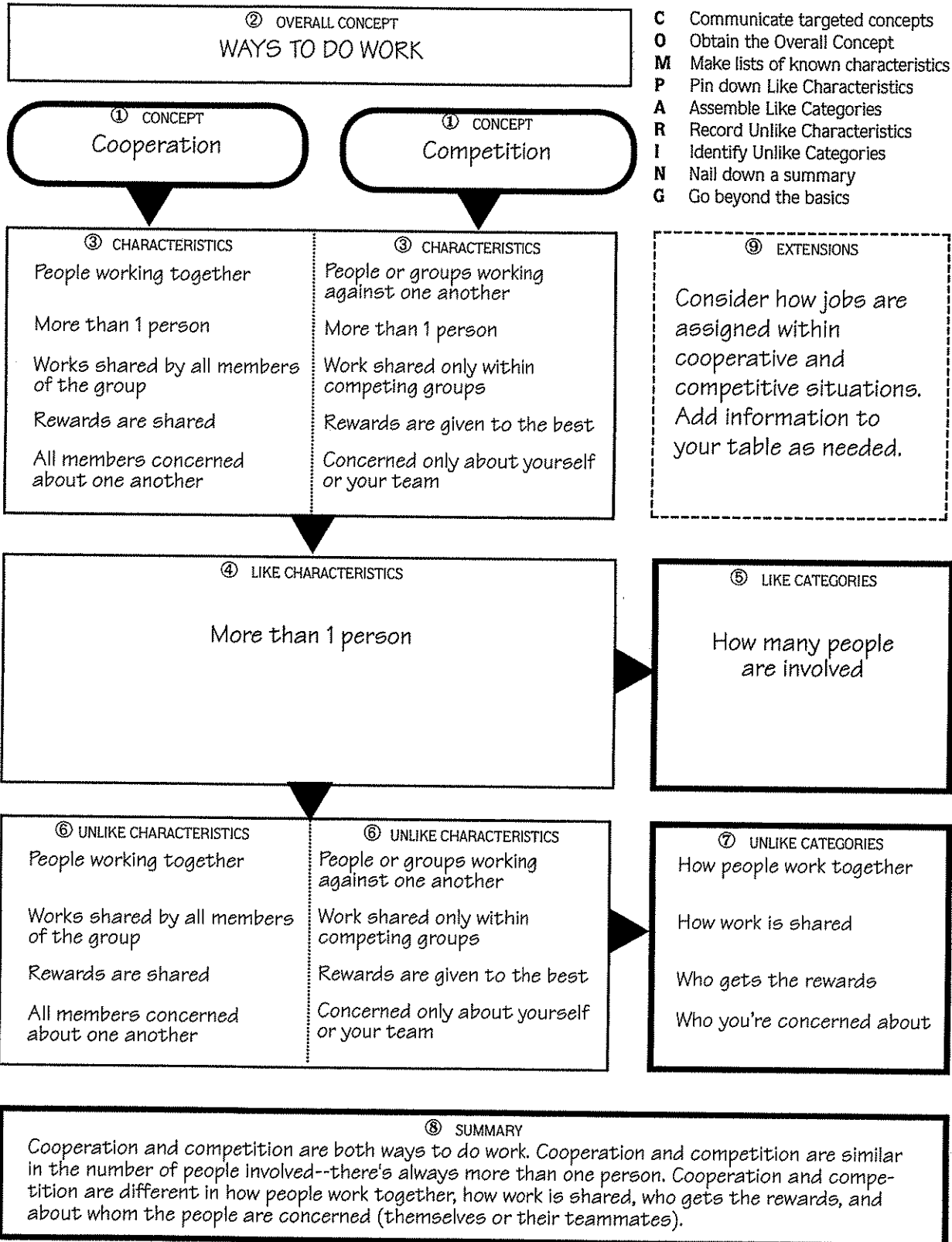
⑥ UNLIKE CHARACTERISTICS	⑥ UNLIKE CHARACTERISTICS
Immigrants in labor force	Slaves in labor force
Profit from industries	Profit from growing cotton
Good land transportation	Poor land transportation

⑦ UNLIKE CATEGORIES
Primary source of labor
Source of profits
Quality of land transportation

⑧ 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.

- C Communicate targeted concepts
- O Obtain the Overall Concept
- M Make lists of known characteristics
- P Pin down Like Characteristics
- A Assemble Like Categories
- R Record Unlike Characteristics
- I Identify Unlike Categories
- N Nail down a summary
- G Go beyond the basics

COMPARISON TABLE



- C** Communicate targeted concepts
- O** Obtain the Overall Concept
- M** Make lists of known characteristics
- P** Pin down Like Characteristics
- A** Assemble Like Categories
- R** Record Unlike Characteristics
- I** Identify Unlike Categories
- N** Nail down a summary
- G** Go beyond the basics

COMPARISON TABLE

