

The Concept Mastery Routine

**The
Content Enhancement
Series**

The University of Kansas
 **Center for Research on Learning**

Manual Revised 1996
Professional Developer's Guide Revised 1998

The Concept Mastery Routine

The Content Enhancement Series

AGENDA

PURPOSE:

To explain, model, prepare for, and practice the Concept Mastery Routine

OBJECTIVES:

1. Explain the Concept Mastery Routine.
2. State rationales for using the Concept Mastery Routine with students.
3. Describe and model the Concept Mastery Routine.
4. Develop an example Concept Diagram and present to colleagues.
5. Plan for implementation of the Concept Mastery Routine.

RESOURCES:

The Concept Mastery Routine guidebook from the Content Enhancement Series published by Edge Enterprises, Lawrence, KS.

Handouts for understanding and constructing Concept Diagrams and using the Concept Mastery Routine from the University of Kansas, Center for Research on Learning, Lawrence, Kansas.

Textbooks and/or content-area materials that can be referred to as drafts of the Concept Mastery are constructed.

Blank overhead transparencies and fine-tip overhead transparency pens for presenting Concept Diagram draft to colleagues.

OUTLINE:

Advance Organizer
Introduction to the Concept Mastery Routine
The Concept Mastery Diagram
The Concept Mastery Linking Steps
The Concept Mastery CUE-DO-REVIEW sequence
Get Ready?: Preparing the Concept Diagram
 Practice in drafting the Concept Diagram
Get Set?: Teaching Students About the Concept Mastery
Go!: Ongoing Use of the Concept Mastery Routine
Win!: Ensuring "The Win"
Planning for Implementation
Post Organizer

OVERHEAD MASTERS AND SUGGESTED SEQUENCE FOR

THE CONCEPT MASTERY ROUTINE

The overheads in this sequence have been included to allow for presentation of the Concept Mastery Routine with or without the use of the transparencies from the Content Enhancement Overview packet.

Advance Organizer

CM Overhead #1 The Concept Mastery Routine: Title Page

Introduction to the Concept Mastery Routine

CM Overhead #2 Content Enhancement Definition
CM Overhead #3 Guidebooks in the Content Enhancement Series
CM Overhead #4 Understanding the Challenge of Diversity
CM Overhead #5 Responding to the Challenge: The Concept Mastery Routine
CM Overhead #6 Supporting Research
CM Overhead #7 Components of the Concept Mastery Routine

The Concept Mastery Device

CM Overhead #8 The Concept Mastery Teaching Device
CM Overhead #9 Concept Diagram Device: Blank
CM Overhead #10 Important Terms
CM Overhead #11 Important Terms (cont.)
CM Overhead #12 Important Terms (cont.)
CM Overhead #13 Concept Mastery Device: Concept
CM Overhead #14 Concept Mastery Device: Overall Concept
CM Overhead #15 Concept Mastery Device: Key Words
CM Overhead #16 Concept Mastery Device: Always Characteristics
CM Overhead #17 Concept Mastery Device: Sometimes Characteristics
CM Overhead #18 Concept Mastery Device: Never Characteristics
CM Overhead #19 Concept Mastery Device: Examples
CM Overhead #20 Concept Mastery Device: Nonexamples
CM Overhead #21 Concept Mastery Device: Pairs of Examples and Nonexamples
CM Overhead #22 Concept Mastery Device: Testing Ground
CM Overhead #23 Concept Mastery Device: Concept Definition

The Concept Mastery Linking Steps: CONCEPT

CM Overhead #24 Rationales for using CONCEPT Linking Steps
CM Overhead #25 The CONCEPT Linking Steps
CM Overhead #26 Understanding the Linking Steps

The Concept Mastery CUE-DO-REVIEW sequence

CM Overhead #27 The CUE-DO-REVIEW Sequence

Get Ready: Preparing the Concept Mastery Diagram

CM Overhead #28 Get Ready?

Insert any of the completed examples of Mastery Diagrams from Appendix B of the manual as needed.

Get Set: Teaching Students About the Concept Mastery

CM Overhead #29 Get Set?

Go: Ongoing Use

CM Overhead #30 Go!

Win: Ensuring "The Win"

CM Overhead #31 Win!

CM Overhead #32 Concept Mastery Implementation Options

CM Overhead #33 Presentation Checks

Training Activities

Concept Mastery Ladder

Concept Mastery Sorting Exercise

These overheads listed above can be inserted anywhere in the training sequence to illustrate the planning process involved in selecting critical concepts for developing Concept Diagrams.

Concept Mastery Device: Blank

Concept Mastery Device: Blank

These overheads listed above can be inserted anywhere in the training sequence to illustrate the design or use of the Concept Diagrams. Extra copies of the blank Concept Diagrams are included in Appendix A of the manual.

Concept Mastery Device: Example (Cooperation)

Concept Mastery Device: Example (Mammal)

Concept Mastery Device: Example (Democracy)

Concept Mastery Device: Example (Fraction)

Concept Mastery Device: Example (Story)

Concept Mastery Device: Example (Fossils)

These examples can also be inserted anywhere in the training sequence to illustrate the design or use of Concept Mastery Diagrams in a variety of subject areas. Completed examples are included in Appendix B of the manual.

The Concept Mastery Routine


The Content Enhancement Series


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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 organize and frame information and tasks:

The Course Organizer Routine
The Unit Organizer Routine
The Survey Routine
The Lesson Organizer Routine
The Framing Routine

Routines to help students understand concepts and information:

The Concept Mastery Routine
The Concept Anchoring Routine
The Concept Comparison Routine
The Clarifying Routine

Routines to help students remember and respond:

The Recall Enhancement Routine
The Quality Assignment 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.

Teachers can take advantage of student diversity as they anchor new information to help students find and build learning on known information.

Responding to the Challenge

The Concept Mastery Routine helps students to:

understand an important targeted concept;

explore their prior knowledge of the concept;






understand the relationship of the targeted concept to the overall concept class to which the targeted concept belongs;

classify characteristics associated with the targeted concept;

explore instances to distinguish examples from nonexamples of the concept;

construct a good definition of the targeted concept.

Supporting Research

-  *The Concept Mastery Routine* has generated information about how teachers learn and use the *Concept Mastery Routine* and how students benefit from its use.
-  In each study, teachers learned *The Concept Mastery Routine* easily, and student learning gains were significant.
-  In the study, students in both LD and NLD groups made substantial increases on unit tests.
-  In the study, students took better notes during the enhancement condition than during baseline. Results of the satisfaction surveys were generally positive for both teacher and student.
-  Student results were achieved in regular classes when teachers: (a) had received 4 hours of instruction and practice using the routine prior to implementing it in their classrooms; (b) had opportunities to discuss the routine and concepts with colleagues and consultants; (c) spent the necessary amount of time to plan and implement the routine; (d) taught their students how to participate in and use the routine to improve their own learning; (e) reviewed the concept and its related elements during the regular test review prior to each test; and (f) used the routine regularly throughout a semester.

Components of

The Concept Mastery Routine



The Concept Diagram
Teaching Device



The CONCEPT
Linking Steps



The
CUE-DO-REVIEW
Sequence



The Concept Diagram

Teaching Device

Is a visual device that:



is used under teacher guidance;



facilitates teaching about an important but different concept;



focuses attention on the overall concept group to which the targeted concept belongs;



identifies critical characteristics of the concept;



prompts elaboration based on prior knowledge;



helps students analyze the differences between examples and nonexamples of the concept;



provides a way for students to practice with new examples;



guides in creating good definitions;



is designed to enhance student

- understanding of new concepts,
- remembering of ways to think about new, difficult information,
- responses to evaluation tasks and activities,
- belief in the value of the content.

CONCEPT DIAGRAM

① CONVEY CONCEPT
OFFER OVERALL CONCEPT

②

③ NOTE KEY WORDS

Never Present

Sometimes Present

Always Present

④ CLASSIFY CHARACTERISTICS

Always Present

Sometimes Present

Never Present

Nonexamples:

Examples:

⑤ EXPLORE EXAMPLES

⑥ PRACTICE WITH NEW EXAMPLE

⑦ TIE DOWN A DEFINITION

③ Key Words

IMPORTANT TERMS

Concept: A concept is a category or class into which events, ideas, or subjects can be grouped. All members of the same concept class must possess all of a set of critical characteristics.

In social studies, concepts include government, revolution, and electoral process.

In science, concepts include igneous rocks, vertebrates, and evolution.

In English, concepts include a sentence, sonnet, and simile.

In mathematics, concepts include triangle, algorithm, and multiplication.

Overall Concept: An overall concept is the category or class into which the targeted concept and similar concepts can be grouped.

IMPORTANT TERMS

(cont.)

Characteristics: Characteristic are things that set examples of a concept apart from examples of all other concepts. Other words for "characteristics" include "qualities," "traits," or "attributes."

Examples: Examples are individual things, events, ideas or processes that possess all of the "always characteristics," possess none of the "never characteristics," and may contain some of the "sometimes characteristics."

Nonexamples: Nonexamples are individual things, events, ideas or processes that lack at least one of the "always characteristics" or have at least one of the "never characteristics."

IMPORTANT TERMS

(cont.)

Definition: A definition must include the following in a complete sentence:

- the name of the targeted Concept;
- the name of the Overall Concept;
- all of the Always Characteristics that must be present in all examples of the concept class;
- any special rule joining the Always Characteristics.

CONCEPT DIAGRAM



Never Present

Sometimes Present

Always Present

Concept

This word or phrase represents the targeted concept for the lesson.

A concept is a category or class into which events, ideas, or objects can be grouped.

- ① CONVEY CONCEPT
- ② OFFER OVERALL CONCEPT
- ③ NOTE KEY WORDS
- ④ CLASSIFY CHARACTERISTICS

groups of
within a
about di
EXPLORE EXA
199

③ **Key Words**

U.S. Civil War

Northern Ireland

citizens

one nation

ethnic

many nations

social rights

"Desert Storm" in Kuwait

- ⑤
- ⑥ PRACTICE WITH NEW EXAMPLE
- ⑦ TIE DOWN A DEFINITION

A civil war is a type of armed conflict among groups of citizens of a single nation that is caused by concerns about distribution of power.

CONCEPT DIAGRAM



- ① CONVEY CONCEPT
- ② OFFER OVERALL CONCEPT
- ③ NOTE KEY WORDS
- ④ CLASSIFY CHARACTERISTICS

Overall Concept

An Overall Concept is the category or class into which the targeted concept and similar concepts can be grouped.

③ Key Words

- U.S. Civil War
- Northern Ireland
- citizens
- one nation
- ethnic
- many nations
- social rights
- Desert Storm in Kuwait

⑤

War

⑥ PRACTICE WITH NEW EXAMPLE

⑦ TIE DOWN A DEFINITION

A civil war is a type of armed conflict among groups of citizens of a single nation that is caused by concerns about distribution of power.

CONCEPT DIAGRAM



Never Present

Sometimes Present

Always Present

Key Words

These words are associated with the targeted concept.

They are generated through brainstorming with students.

A civil war is a type of armed conflict among groups of citizens of a single nation that is caused by concerns about distribution of power.

CONVEY CONCEPT

OFFER OVERALL CONCEPT

NOTE KEY WORDS

CLASSIFY CHARACTERISTICS

groups

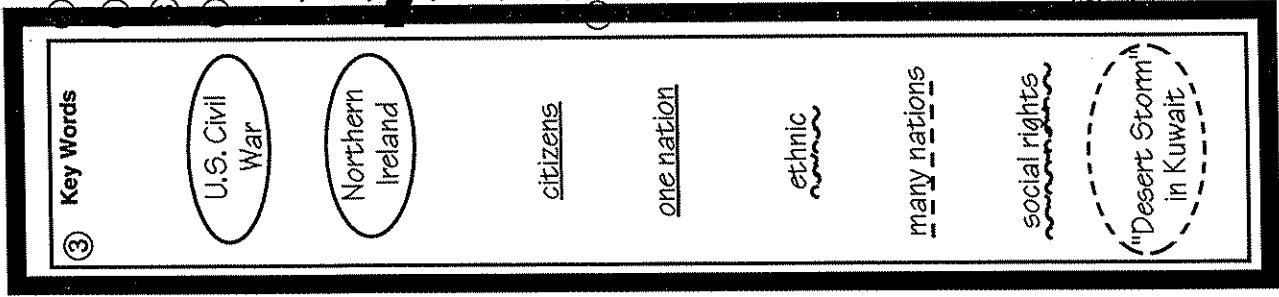
within

EXPLORE

19

PRACTICE WITH NEW EXAMPLE

TIE DOWN A DEFINITION



CONCEPT DIAGRAM



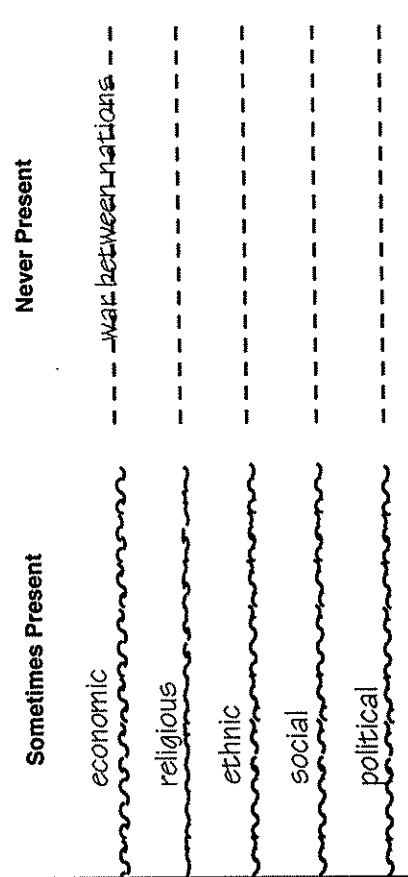
- ① CONVEY CONCEPT
- ② OFFER OVERALL CONCEPT
- ③ NOTE KEY WORDS

④ CLASSIFY CHARACTERISTICS Always Present

groups of citizens _____

within a single nation _____

about distribution of power _____



- ⑤ EXPLORE EXAMPLES Examples:
- ⑥ PRACTICE
- ⑦ TIE DOWN DEFINITION

③ Key Words

U.S. Civil War

Northern Ireland

citizens

one nation

ethnic

many nations

social rights

"Desert Storm" in Kuwait

Always Characteristics

Must ALL be present in every example of the concept.

These are the characteristics used to create a good definition.

CONCEPT DIAGRAM



- ① CONVEY CONCEPT OFFER OVERALL CONCEPT
- ② NOTE KEY WORDS

- ③ CLASSIFY CHARACTERISTICS Always Present

groups of citizens
within a single nation
about distribution of power

- Never Present

war between nations

- ⑤ EXPLORE EXAMPLES Examples:

③ **Key Words**

- U.S. Civil War
- Northern Ireland
- citizens
- one nation
- ethnic
- many nations
- social rights
- "Desert Storm" in Kuwait

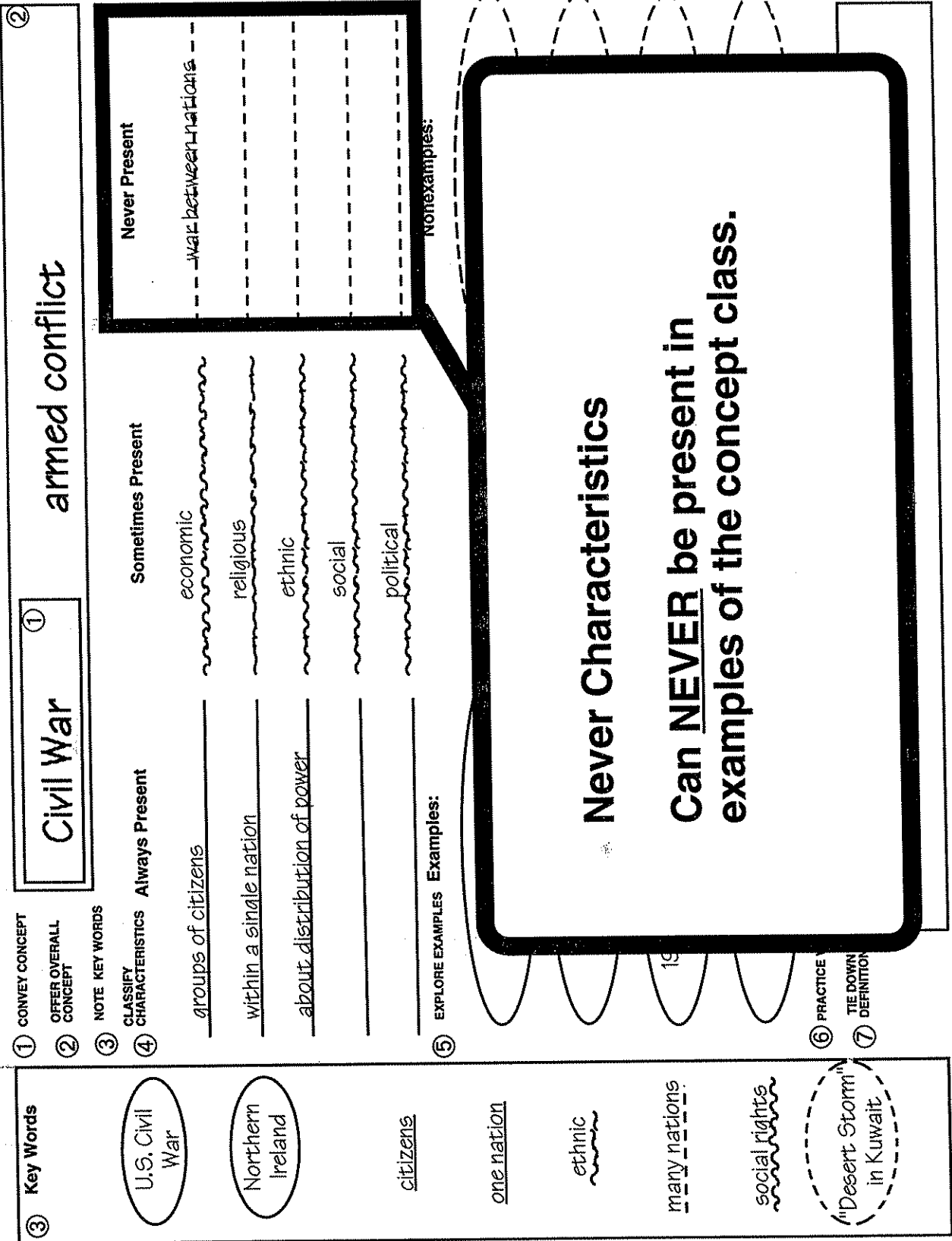
- Nonexamples:

Sometimes Characteristics

Are found in SOME but not all examples of the concept class.

- ⑥ PRACTICE WITH
- ⑦ TIE DOWN DEFINITION

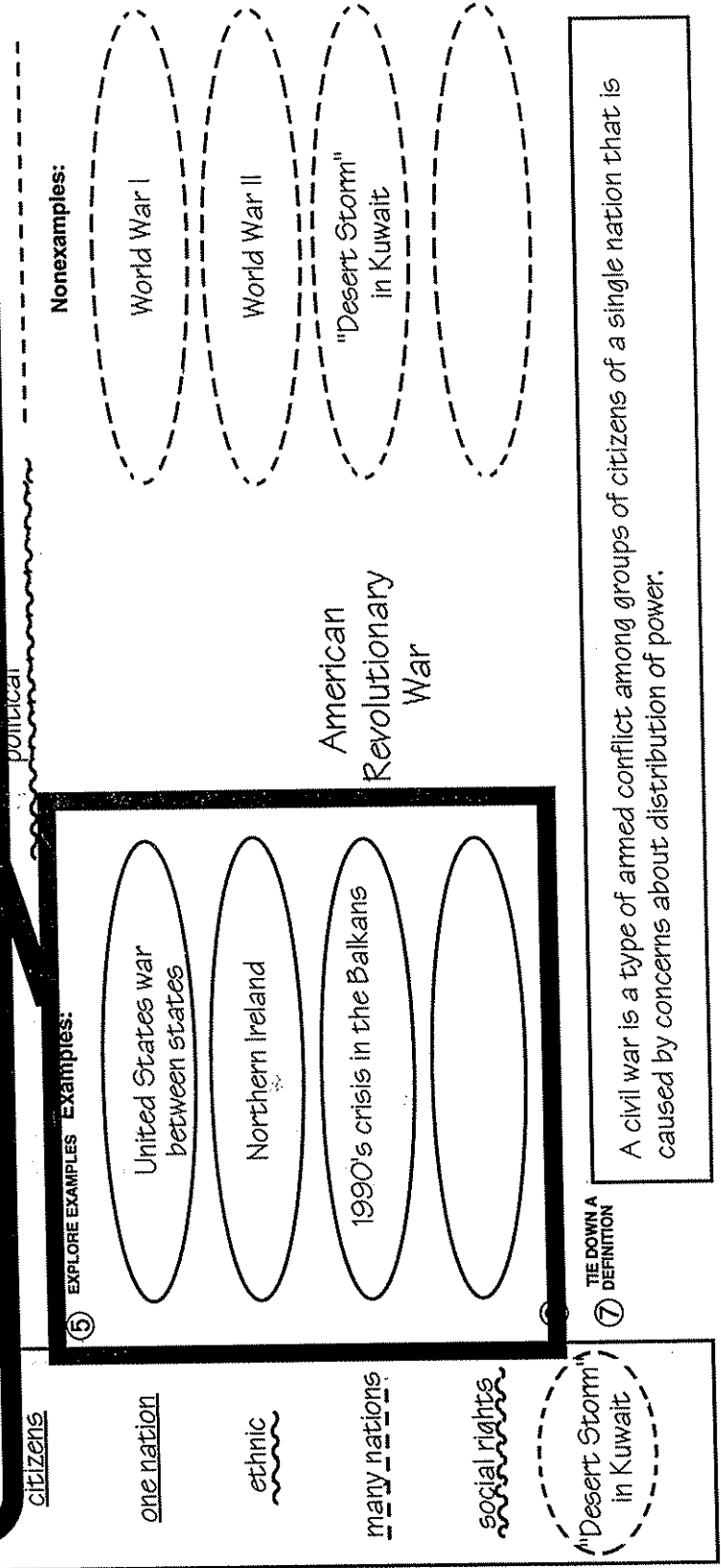
CONCEPT DIAGRAM



CONCEPT DIAGRAM

Examples

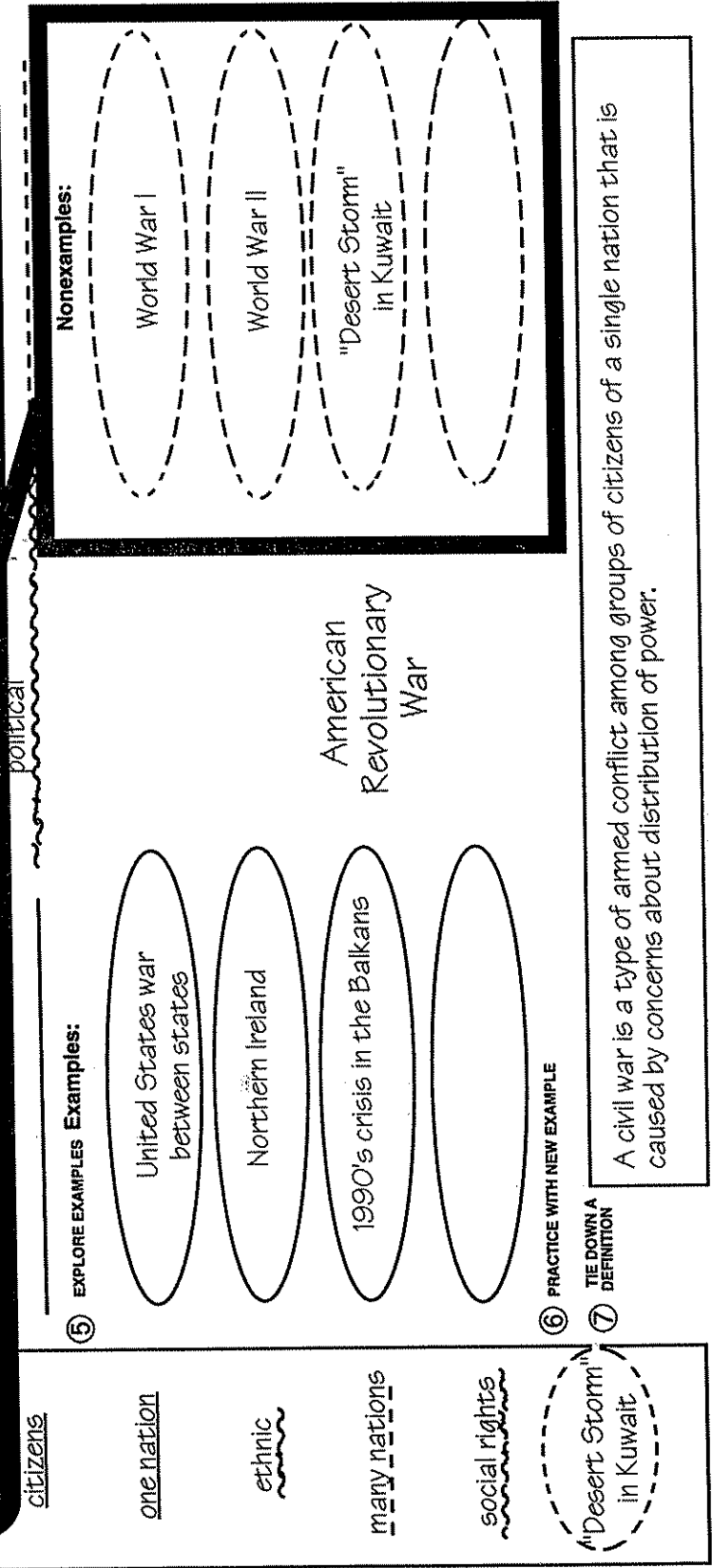
Examples are instances that possess all of the Always Characteristics, none of the Never Characteristics, but some of the Sometimes Characteristics.



CONCEPT DIAGRAM

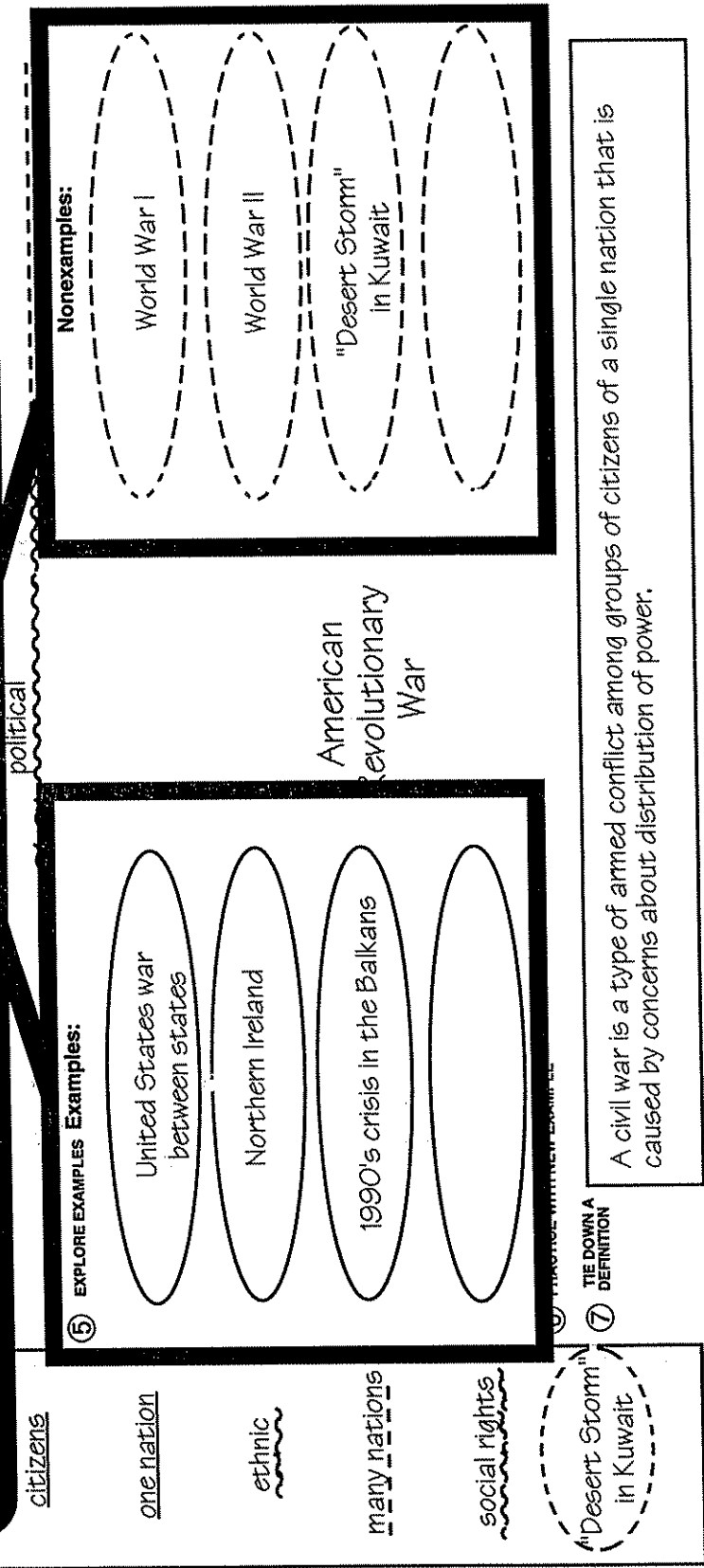
Nonexamples

Nonexamples are instances that are missing one or more of the Always Characteristics and/or have one or more of the Never Characteristics.



CONCEPT DIAGRAM

Pairs of Examples and Nonexamples
Construct the first pair of examples and nonexamples so that students can easily distinguish between them.
Then, construct pairs of examples and nonexamples that are increasingly more difficult to distinguish from each other.



CONCEPT DIAGRAM



Testing Ground

This space is used to list possible examples to be sorted into either examples or nonexamples columns.

Northern Ireland

1990's crisis in the Balkans

American Revolutionary War

World War II

"Desert Storm" in Kuwait

3 Key Words

U.S. Civil War

Northern Ireland

citizens

one nation

ethnic

many nations

social rights

"Desert Storm" in Kuwait

6 PRACTICE WITH NEW EXAMPLE

7 TIE DOWN A DEFINITION

A civil war is a type of armed conflict among groups of citizens of a single nation that is caused by concerns about distribution of power.

CONCEPT DIAGRAM

③ Key Words	① CONVEY CONCEPT	②
	OFFER OVERALL CONCEPT	Civil War
	NOTE KEY WORDS	armed conflict

Concept Definition

A definition must include the following in a complete sentence(s):

- the name of the targeted Concept
- the name of the Overall Concept
- all of the Always Characteristics and
- any special rule joining the Always Characteristics.

⑥ PRACTICE WITH NEW EXAMPLE	
⑦ THE DOMAIN DEFINITION	A civil war is a type of armed conflict among groups of citizens of a single nation that is caused by concerns about distribution of power.

social rights

"Desert Storm in Kuwait"

Rationales for Using



The **CONCEPT** Linking Steps

Guide the teacher in ways to:



present the Concept Diagram effectively;



involve students in constructing and using the Concept Diagram;



elicit and make connections to the prior knowledge of students; and



focus student attention on learning.

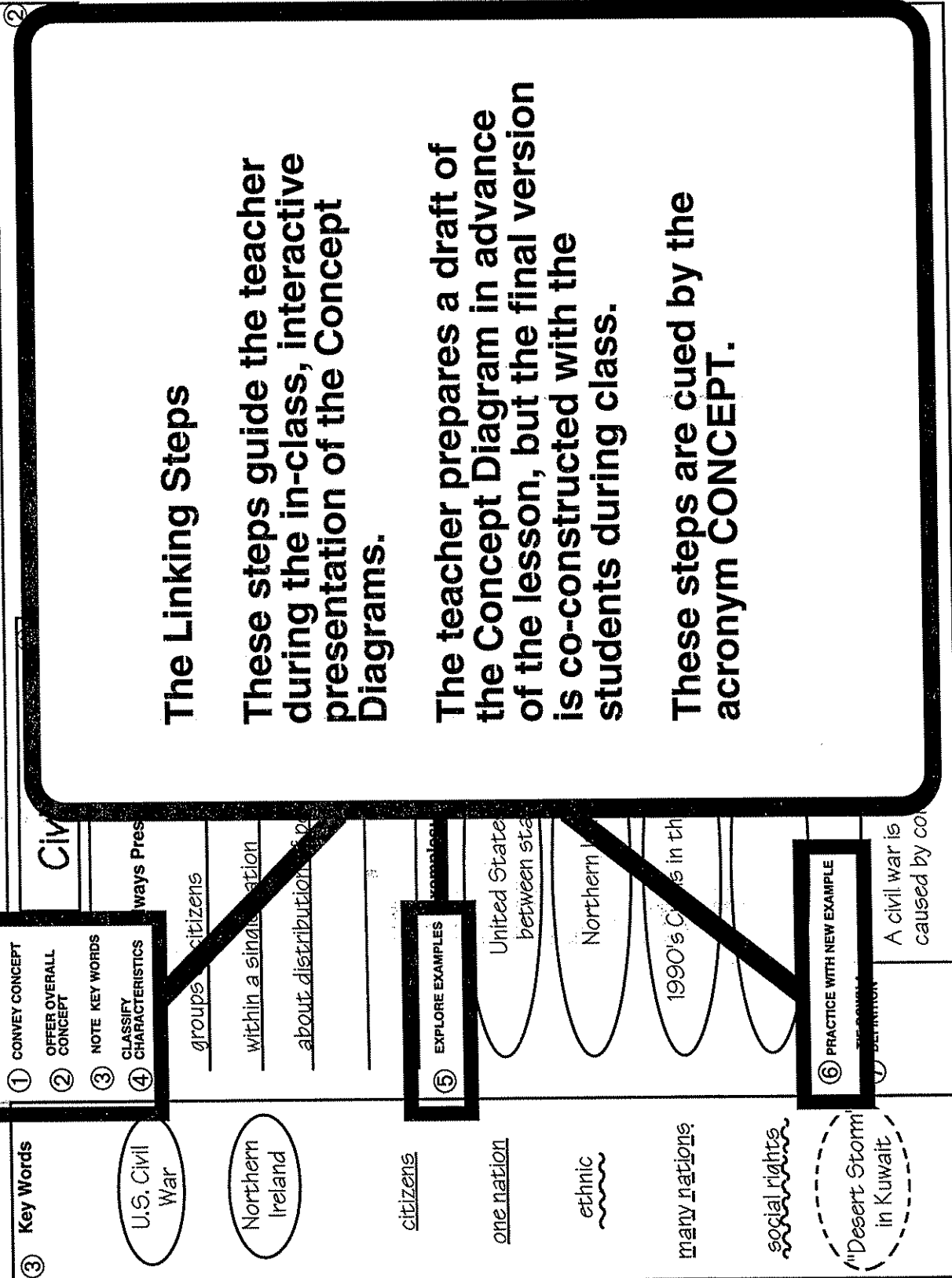


The **CONCEPT**

Linking Steps

1. Convey the targeted concept.
2. Offer the overall concept.
3. Note key words.
4. Classify characteristics
always, sometimes, or
never present.
5. Explore examples and
nonexamples.
6. Practice with a new example.
7. Tie down a definition.

CONCEPT DIAGRAM





The CUE-DO-REVIEW Sequence

The overall instructional process that guides the use of the Concept Diagram and CONCEPT LINKING Steps.

This instructional process involves:



CUE

The teacher announces the Concept Diagram and explains its use and expectations for student participation.



DO

The teacher and class collaboratively construct the device using the CONCEPT Linking Steps that "connect" the content to the needs and goals of students.



REVIEW

Information presented in the Concept Diagram is reviewed and confirmed, and the process of developing the concept is reviewed.

Get Ready?

Select content for routine. (p. 14)*

Decide when to use the routine. (p. 15)*

Collect needed materials. (p. 15)*

Construct a draft. (p. 16)*

1. Enter the name of the Targeted Concept.
2. Enter the name of the Overall Concept.
3. Note the Key Words.
4. Classify the characteristics.
5. Establish examples and nonexamples of the concept.
6. Identify practice examples.
7. Create a definition of the Targeted Concept.

Select implementation option. (p. 28)*

* Page numbers given here refer to the location in the Manual.

Get Set?

Choose lesson material for the Concept Diagram. (p. 20)*

Introduce the Concept Diagram. (p. 20)*

Describe how you will CUE the Concept Diagram. (p. 22)*

Describe and model how you will DO the routine. (p. 22)*

Explain how you will REVIEW the information in the Concept Diagram. (p. 25)*

Debrief. (p. 26)*

* Page numbers given here refer to the location in the Manual.

Go!

Use the routine explicitly. (p. 27)*

Build lessons around the Concept Diagram. (p. 27)*

Build in continuity of the Concept Diagram as needed. (p. 27)*

Evaluate your use of the routine. (p. 28)*

Be creative. (p. 28)*

Beware of “pit” monsters. (p. 29)*

* Page numbers given here refer to the location in the Manual.

Win!

Select the Concept Diagram as a personal growth target. (p. 30)*

Choose a way to learn. (p. 30)*

Choose a support system. (p. 30)*

Plan for confidence building. (p. 30)*

Debug. (p. 30)*

Maximize the challenge. (p. 31)*










Develop your "Ensurance" policy. (p. 31)*

* Page numbers given here refer to the location in the Manual.

The Concept Mastery Implementation Options

1. Use *The Concept Mastery Routine* at the end of a lesson or unit in order to check for understanding of a difficult concept that has been developed over a period of time.
2. Implement *The Concept Mastery Routine* at the beginning of a lesson (or unit) to elicit students' relevant background knowledge and to pinpoint inaccurate prior knowledge.
3. Use *The Concept Mastery Routine* throughout an entire lesson when you determine that understanding of the Targeted Concept is a critical foundation for future learning.
4. Vary the sequence of steps you use to construct the diagram. For example, explore examples before making a Key Word List and classifying characteristics.
5. Vary the Concept Diagram that you use.
6. Use the Concept Diagram as an assessment tool. As a part of a unit test, give your students a blank diagram and ask them to fill it in for a concept that was analyzed.
7. Ask your students to write an answer to a question on the next test about the concept that has been analyzed.
8. Tell your students that there will be an essay question on the next test about the concept that has been analyzed.
9. Group your students in different ways during the "Practice with a New Example" step. Have them work individually, in pairs in small groups, and in larger groups.
10. Once students have become very familiar with the diagram, have them construct their own diagrams. At the end of a unit, assign students to small groups and have each group choose a concept from the unit to analyze.

Presentation Checks

-  Is the Concept Diagram large enough to see from the back of the classroom?
-  Are all the words legible?
-  Are characteristics presented in a parallel fashion, e.g., all sentences or all 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 Concept Diagram?
-  Do students understand each part of the Concept Diagram?
-  Have you checked on student understanding of the concept definition on the Concept Diagram?
-  Have you checked for student understanding of the process involved in developing the Concept Diagram?
-  Have you made sure students know how to demonstrate understanding of the Concept, i.e., definition or analysis of an unencountered example?

Training Activities for The Concept Mastery Routine

Before the workshop session, ask participants to bring to the workshop their textbooks and any other materials they use to teach one of their courses to the workshop. Bring some textbooks to the workshop session yourself for those who might forget to bring materials.

1. Review the definition of a "concept." Give a few examples of concepts. Explain the idea of the "concept ladder." Explain that the item at the very bottom rung of the ladder is an "example," the item at the very top rung of the ladder is a "concept," and the items on the middle rungs can be either examples or concepts, depending on instructional levels. For example, if "vertebrates" were selected as the targeted concept, one of the examples would be "birds," in addition to "fish," "amphibians," "reptiles," and "mammals." If, however, "animals" were selected as the targeted concept, then one of the examples would be "vertebrates" in addition to "invertebrates."

Have a discussion about the level at which they want to be teaching. Do they want to be teaching at the level of the first rung, the second rung, etc.? Discuss the reasons why. Discuss the conditions under which they might want to teach at different levels. Then ask the participants to look through their course materials (textbook, notes) and to identify and make a list of at least five concepts that they would like to ensure that their students understand. Circulate among the participants and provide help as needed.

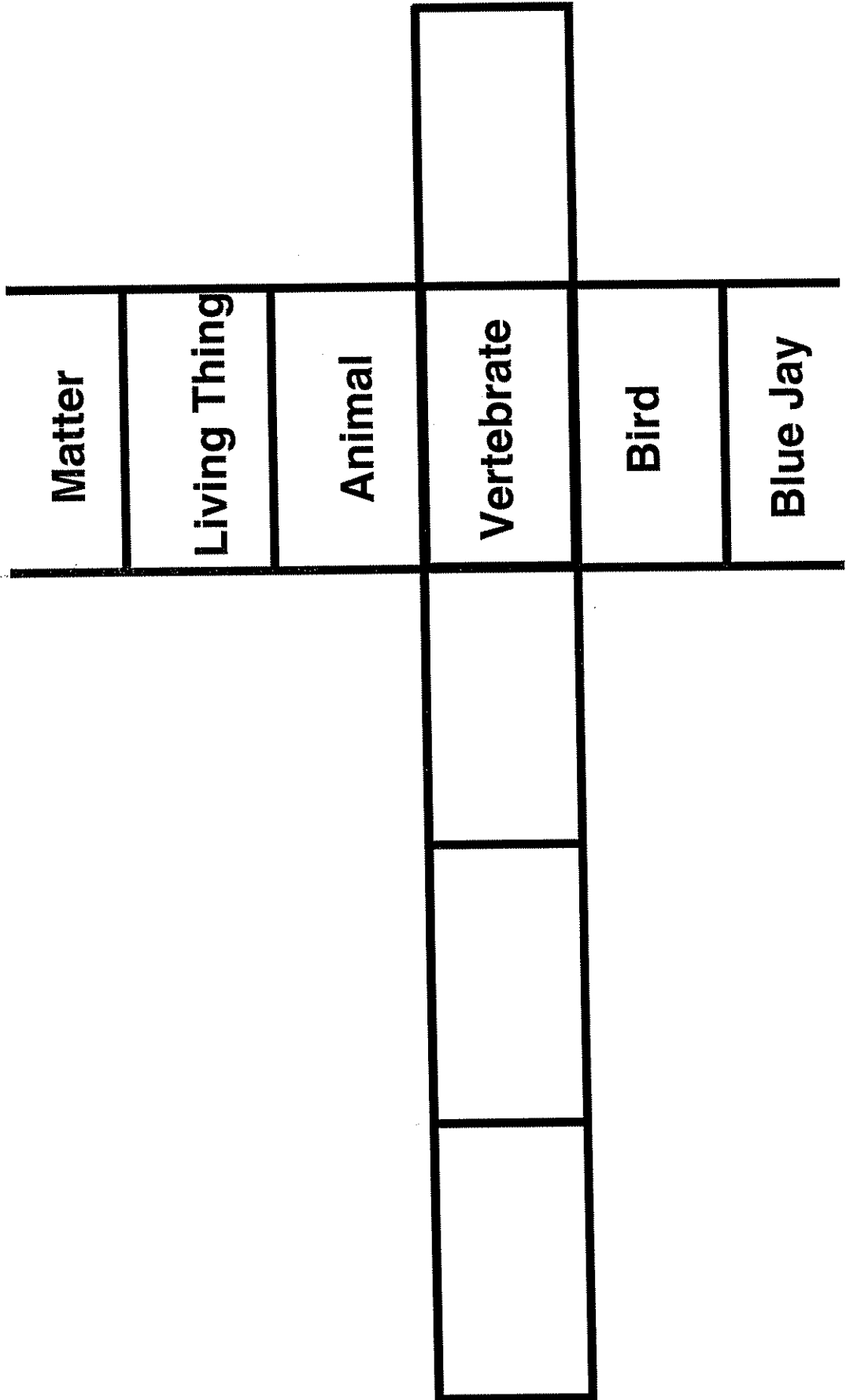
2. Before beginning to describe *The Concept Mastery Routine*, model how you would use the routine with them to teach them about a new concept. (Choose a concept that would be interesting to them and that is also familiar to them.) Be sure to do all of the phases of the CUE-DO-REVIEW Sequence and all of the Linking Steps.

3. After you have provided an overview of the routine and have described the sections of the Concept Diagram, distribute the *Concept Mastery Sorting Exercise* to the participants. Ask the participants to look through the list of items on the *Concept Mastery Sorting Exercise* and then place check marks in the column(s) labeled "overall concept," "targeted concept," "example," or "characteristic" that best describe each item. Remind them that in some cases check marks may be placed in more than one column. Circulate among the participants and provide help as needed. Then, lead a discussion about differences in instructional levels depending on the selection of an item as an "overall concept," "targeted concept," or "example."

4. Distribute a copy of a blank Concept Diagram to participants. Ask the participants to write each of the items from the *Concept Mastery Sorting Exercise* in one of the sections of the Concept Diagram. Explain that they can add other items as they see fit. Circulate among the participants, and provide help as needed. Have different people come in front of the whole group and add items to an overhead copy of the Concept Diagram. Discuss any discrepancies among the participants.

5. Ask the participants to prepare a Concept Diagram from one of the five concepts they selected earlier from their own content materials. This may be done by an individual, in pairs, or in small groups. If participants represent whole departments in a school or if some of the participants teach the same course, ask them to meet as a group. Circulate among the participants as they work individually, in pairs, or in groups. Have different people come up in front of the whole group and present their diagrams to the whole group.

Concept Mastery Ladder



CONCEPT DIAGRAM

① CONVEY CONCEPT

② OFFER OVERALL CONCEPT

③ NOTE KEY WORDS

④ CLASSIFY CHARACTERISTICS

Always Present

Sometimes Present

Never Present

①

②

③ Key Words

Nonexamples:

Examples:

⑤ EXPLORE EXAMPLES

⑥ PRACTICE WITH NEW EXAMPLE

⑦ TIE DOWN A DEFINITION

Key Words

Empty rectangular box for key words.

CONCEPT DIAGRAM

EXPLORE EXAMPLES Examples:

Four solid ovals for examples.

Nonexamples:

Four dashed ovals for nonexamples.

NOTE KEY WORDS

Always Present

Sometimes Present

Never Present

CLASSIFY CHARACTERISTICS

Handwriting practice lines: solid for 'Always Present', wavy for 'Sometimes Present', and dashed for 'Never Present'.

CONVEY CONCEPT

OFFER OVERALL CONCEPT

TIE DOWN A DEFINITION

PRACTICE WITH NEW EXAMPLE

Three horizontal boxes for writing responses.

Concept Mastery Sorting Exercise

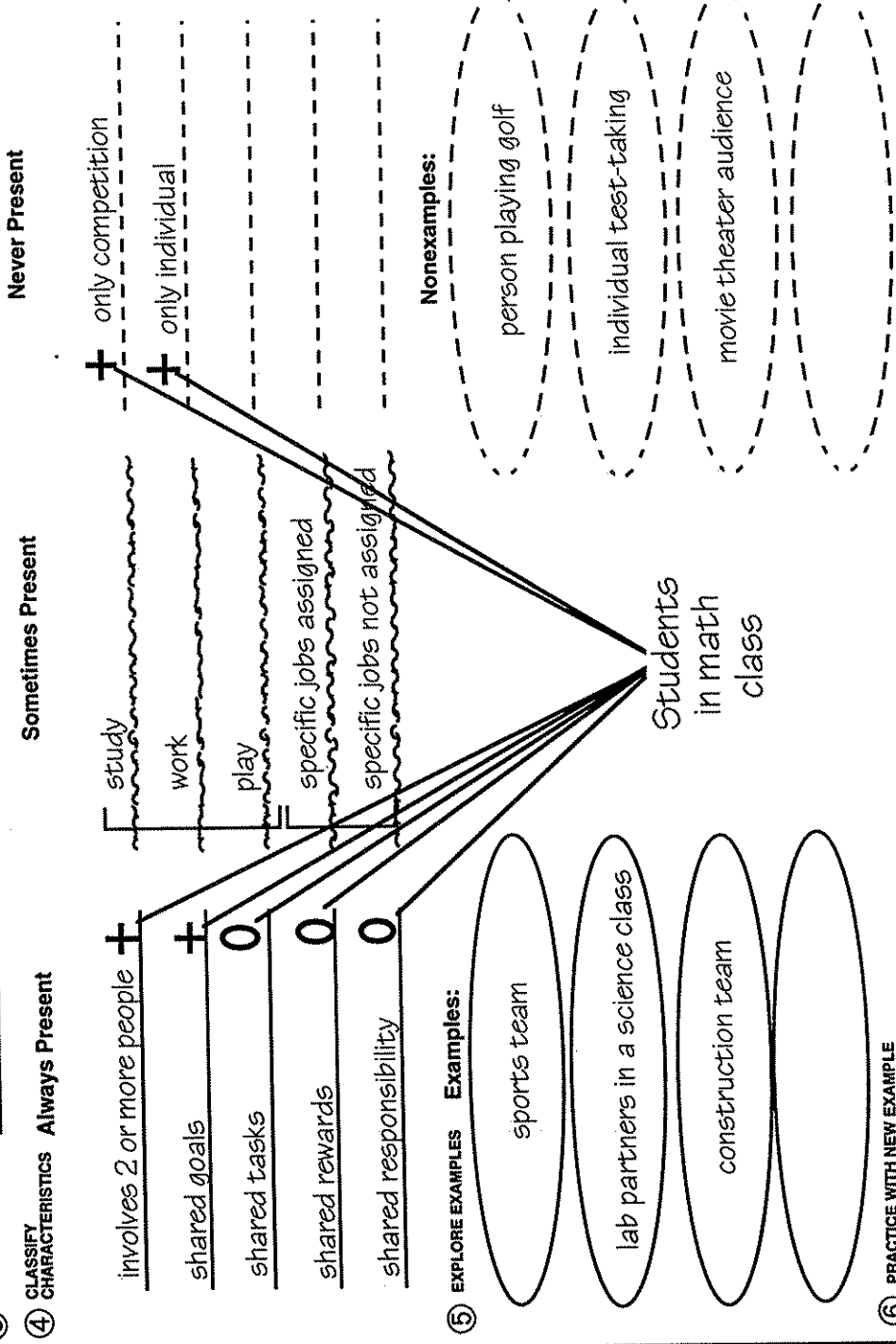
Concept Name: Mammal

	Overall Concept	Targeted Concept	Example	Characteristics
Bat				
Bird				
Warm-blooded				
Walks on 2 legs				
Snake				
Swims in water				
Shark				
Moves on ground				
Nurses young				
Elephant				
Cold-blooded				
Human				
Can fly				
Whale				
Walks on 4 legs				
Alligator				
Mammal				
Vertebrate				

CONCEPT DIAGRAM

① **Cooperation** a way to do tasks

- ① CONVEY CONCEPT
- ② OFFER OVERALL CONCEPT
- ③ NOTE KEY WORDS
- ④ CLASSIFY CHARACTERISTICS

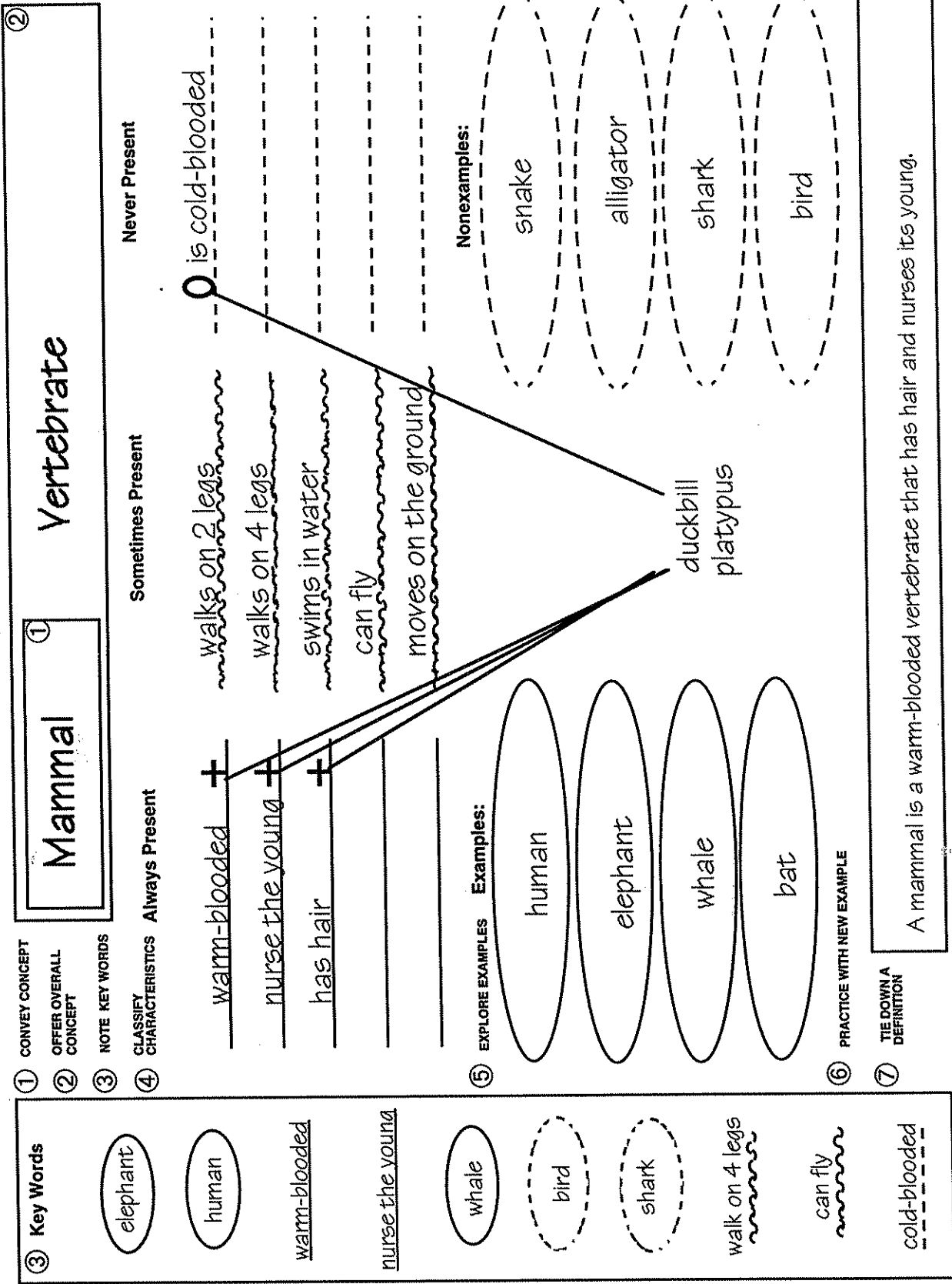


- ③ **Key Words**
- sports team
- lab partners in science
- rewards
- 2 or more people
- shared responsibility
- goals
- assigned jobs
- competition

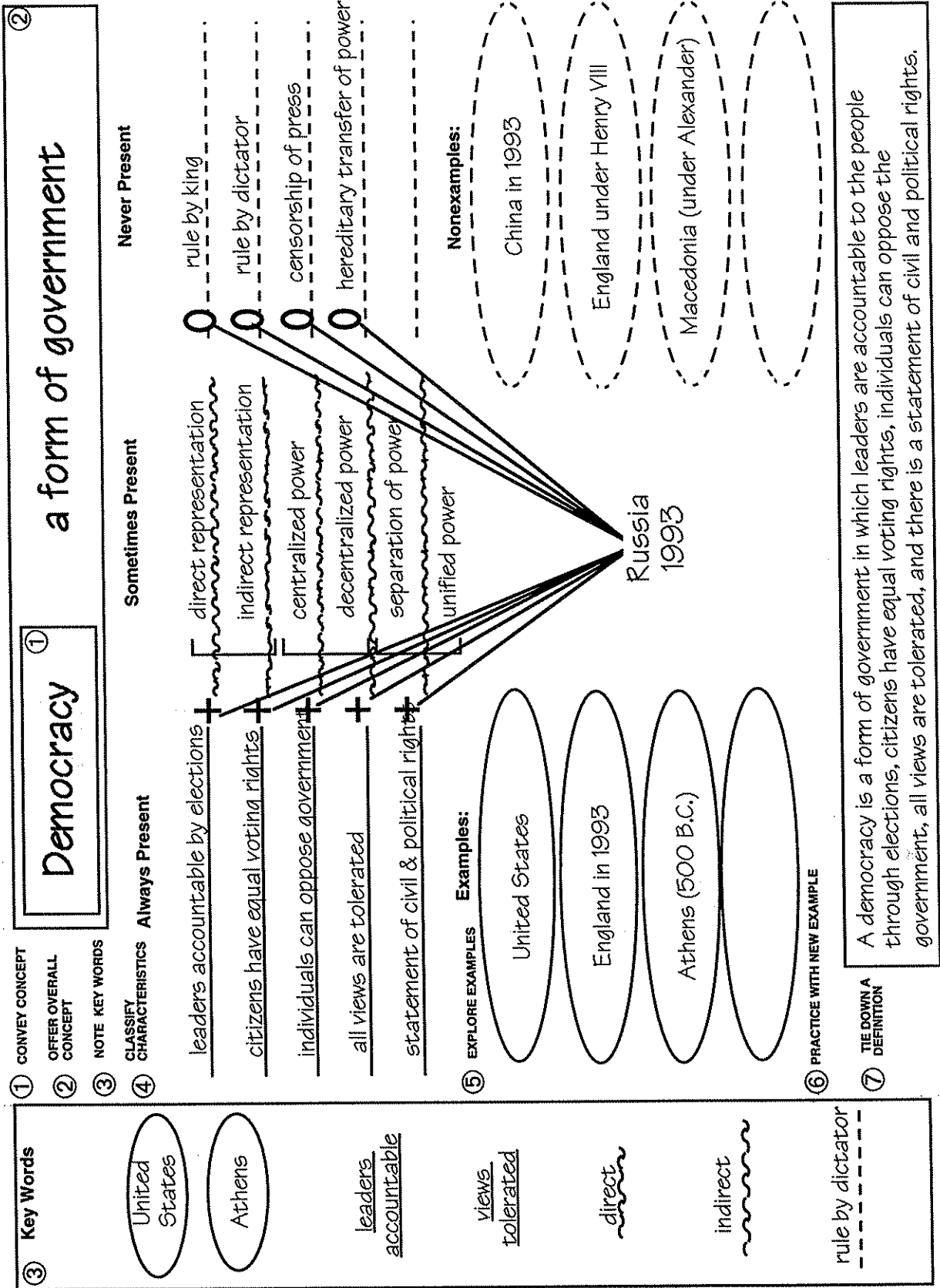
- ⑤ EXPLORE EXAMPLES
- ⑥ PRACTICE WITH NEW EXAMPLE
- ⑦ TIE DOWN A DEFINITION

Cooperation is a way to do tasks that involves two or more people with shared goals, tasks, rewards, and responsibilities.

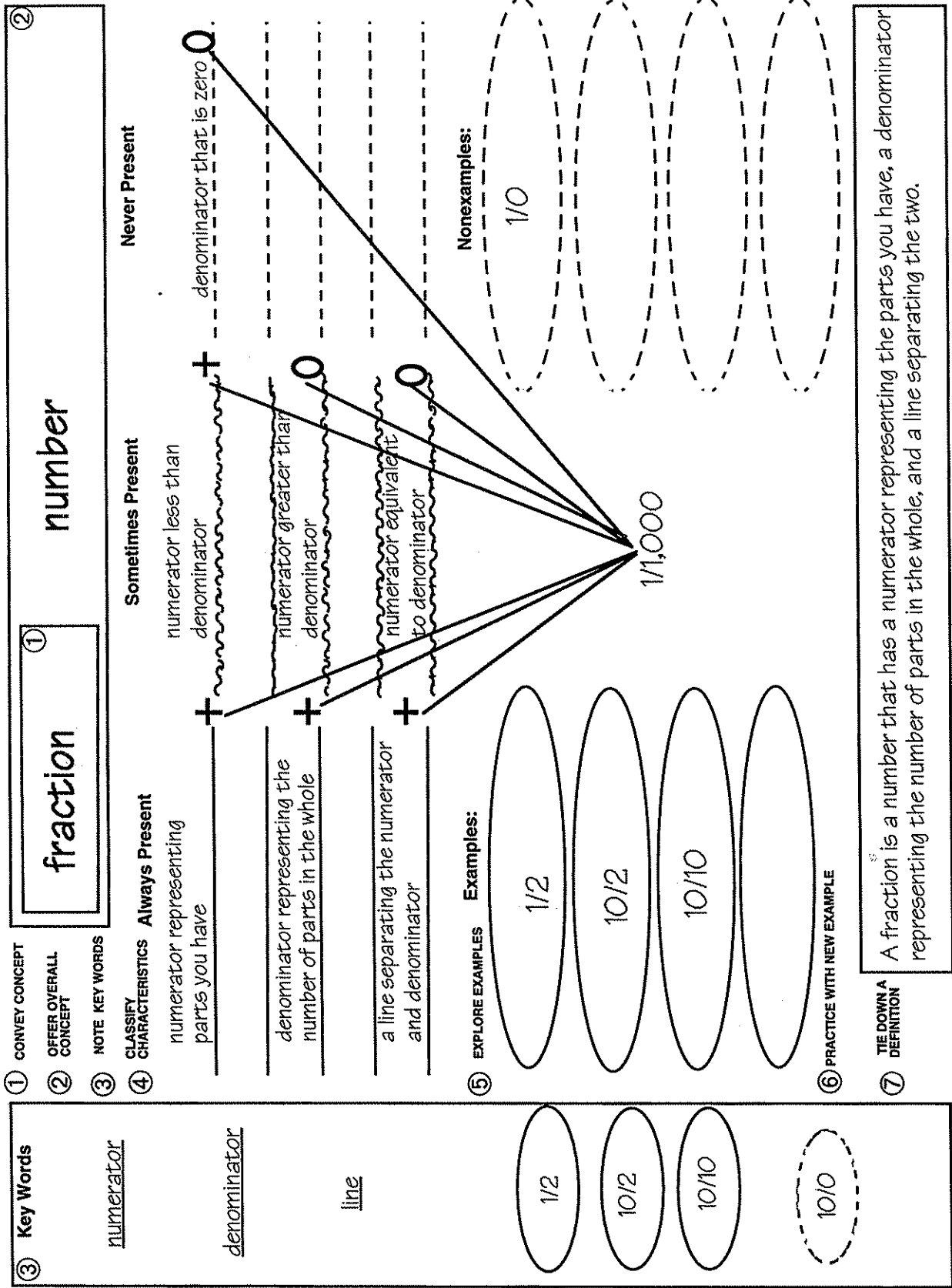
CONCEPT DIAGRAM



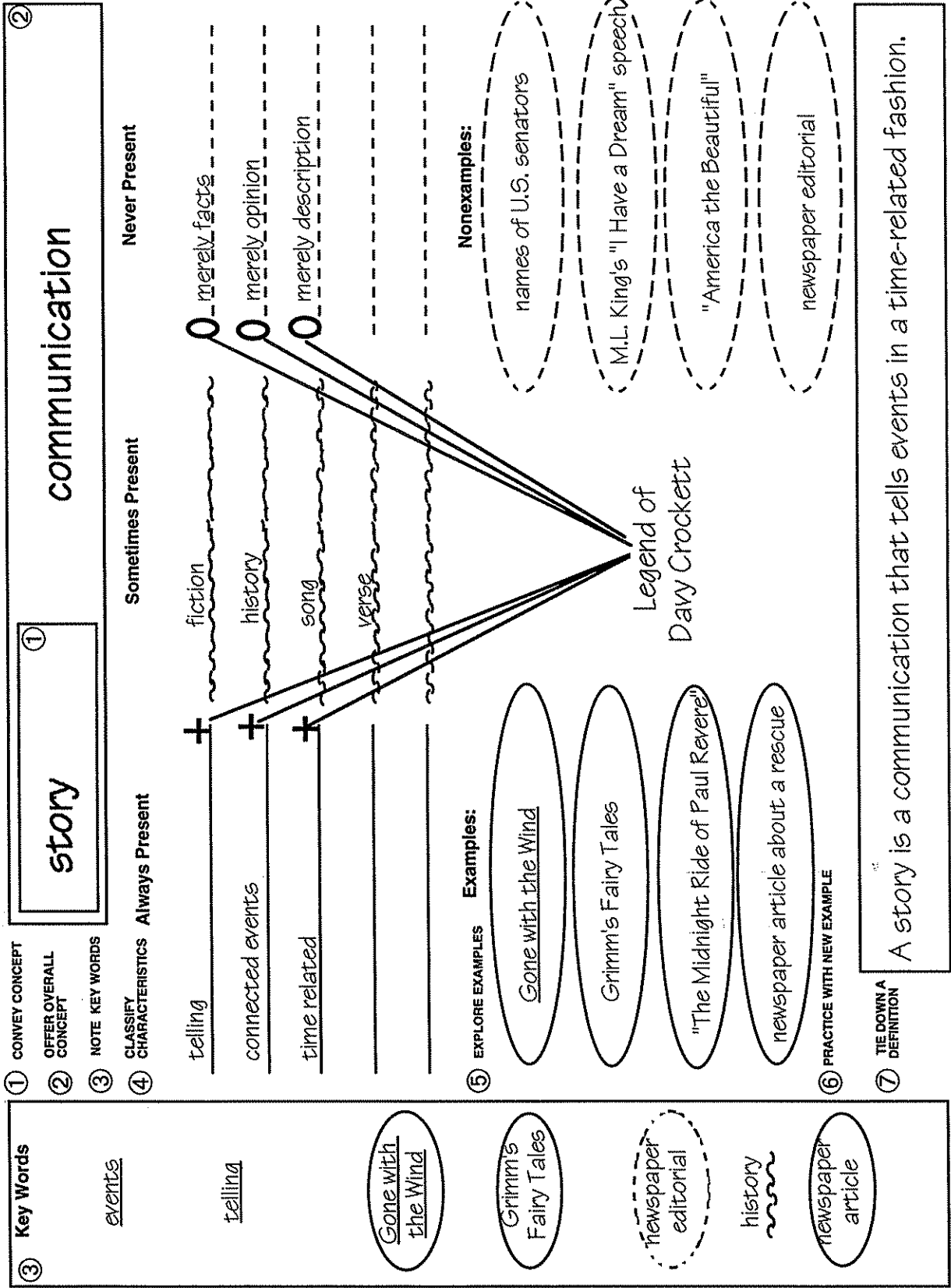
CONCEPT DIAGRAM



CONCEPT DIAGRAM



CONCEPT DIAGRAM



CONCEPT DIAGRAM

EXPLORE EXAMPLES

Examples:

tigers in La Brea tar pits

Siberian mammoth

petrified forest in Arizona

fish skeleton in limestone layers

Nonexamples:

your pet cat

elephant in Africa today

tree limbs and leaves in your yard

fish in supermarket

trilobite

Key Words

mammoth

fish skeleton

frozen in ice

pet cat

alive

NOTE KEY WORDS CLASSIFY CHARACTERISTICS

Always Present

plants or animals

lived thousands of years ago

preserved

Sometimes Present

frozen in ice

trapped in tar

crushed by water

in volcanic ash

Never Present

still alive

still decaying

CONVEY CONCEPT

OFFER OVERALL CONCEPT

fossils

remains or prints

TIE DOWN A DEFINITION

PRACTICE WITH NEW EXAMPLE

Fossils are remains or prints of plants or animals who lived thousands of years ago which have been preserved.