

# TEACHING STRATEGIES



**Concept Attainment**

**Concept Development**



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# CONCEPT ATTAINMENT MODEL

## BACKGROUND

Our world is filled with an infinite number of objects, events, and ideas; yet, we manage to talk about them all with a few thousand words. What helps to make this possible is the process of concept attainment and development. Concept attainment is the process of defining concepts by determining the attributes that are absolutely essential to the meaning and disregarding those that are not. It also means learning to discriminate between what is and what is not an example of the concept.

Teaching concept attainment is very similar to the natural process of concept learning. Concepts are our tools for organizing information. The concept attainment model is designed to teach concepts and help students become more efficient at learning and creating concepts. It is effective in defining, comprehending, applying, and using concepts.

The Concept Attainment Model is based on the research efforts of Jerome Bruner. This model is designed to lead students to a concept by asking them to compare and contrast examples that contain the characteristics or attributes of the concepts with examples that do not contain these attributes. It is based on the assumption that one of the best ways to learn a concept is by observing examples of it.

**A concept has 4 elements:**

- 1. a name: dog**
- 2. examples: Poodle, Collie**
- 3. attributes: hair, 4 legs, tail, barks**
- 4. attribute values (some are essential and some are non-essential)  
bark is essential; friendly is non-essential**

## Concept Attainment: Palindromes



The concept attainment strategy inspires students to use critical thinking strategies to find critical attributes of a given concept. It seems like a game to students, but it actually requires higher level thinking skills.

Use pictures, words, and/or actual objects to present the concept attainment strategy. Sequence the items in the order provided. Always start with a “yes” example. Follow with a “no” example. The additional examples should be given in random order. Do avoid giving too many “no” examples at one time. They are given to help clarify what the “yes” examples have in common.

### Procedure:

1. Give the examples in the order listed.
2. During the strategy, ask for additional “yes” examples to verify that students are getting the concept.
3. Provide a “twist” to promote higher-level thinking. (Students are lead to think a concept until an example stumps them and causes them to regroup.)
4. Once most students seem to have the concept, ask for critical attributes that describe the concept.
5. Record their list of critical attributes where they can be observed.
6. Look at the critical attributes and pull from the students a rule or a name for the concept. Give the name “palindromes” after students have the attributes as this is probably a new vocabulary term for many students.
7. Have students discuss their thinking processes throughout the strategy beginning with their first assumptions and how they changed.

### Examples:

#### Yes

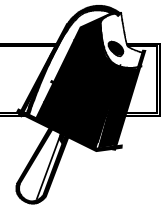
1. Dad
3. Mom
6. Pop
7. Eve
9. Nun
11. Madam (twist)
13. Noon
15. level
18. A Toyota
19. Able was I ere I saw Elba
20. radar

#### No

2. Brother
4. Sister
5. Cousin
8. Aunt
10. Grandmother
12. Mother
14. morning
16. rear
17. A Ford

All of the “yes” examples represent palindromes. The rule is that all words or phrases read the same from the front and the back.

## Concept Attainment: Things That Melt



The concept attainment strategy inspires students to use critical thinking strategies to find critical attributes of a given concept. It seems like a game to students, but it actually requires higher level thinking skills.

Use pictures, words, and/or actual objects to present the concept attainment strategy. Sequence the items in the order provided. Always start with a “yes” example. Follow with a “no” example. The additional examples should be given in random order. Do avoid giving too many “no” examples at one time. They are given to help clarify what the “yes” examples have in common.

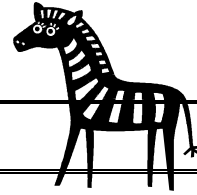
### Procedure:

1. Give the examples in the order listed.
2. For primary grades, give the first three examples as a “yes,” a “no,” and a “yes.”
3. Next, have students generate a list of possibilities that the “yes” examples have in common. Write their list of examples on a chart.
4. Continue with the examples in the order given. Add a few more possibilities as students provide them. Adjust the list by adding to it and marking off examples that are now excluded.
5. Periodically, let children signal with thumbs up or thumbs down that they know or do not know the concept. Ask if they can give more “yes” examples. The “no” examples are also helpful in clarifying the concept.
6. Once all examples are shown, again have students signal as to whether or not they know the concept. Pull out and isolate the most obvious examples if they need guidance and are stumped on the concept (ice and candle could be possibilities). Get them to look only at these most obvious examples and decide what they have in common. Work at pulling the concept from the students. Do not give the answer.
7. In pulling the activity to a close, have students tell things about the “yes” examples without giving the concept. This could be a harder step for younger children, and they may need guidance with ideas such as “they can turn to a liquid, most are cold...”
8. Pull for the concept from the students: things that melt.
9. Finally, have students discuss their thinking processes throughout the activity.

### **Examples:**

- Yes
1. Butter
  3. Cheese
  6. Ice Cream
  7. Marshmallow
  9. Crayola
  11. Candle
  13. Ice
  16. Popsicle

- No
2. Bread
  4. Pizza
  5. Pie
  8. Cookie
  10. Pencil
  12. Flower
  14. Milk
  15. Eggs



## Concept Attainment: Mammals

The concept attainment strategy inspires students to use critical thinking strategies to find critical attributes of a given concept. It seems like a game to students, but it actually requires higher level thinking skills.

Use pictures, words, and/or actual objects to present the concept attainment strategy. Sequence the items in the order provided. Always start with a “yes” example. Follow with a “no” example. The additional examples should be given in random order. Do avoid giving too many “no” examples at one time. They are given to help clarify what the “yes” examples have in common.

### Procedure:

1. Give the examples in the order listed.
2. During the strategy, ask for additional “yes” examples to verify that students are getting the concept.
3. Provide a “twist” to promote higher-level thinking. (Students are lead to think a concept until an example stumps them and causes them to regroup.)
4. Once most students seem to have the concept, ask for critical attributes that describe the concept.
5. List the critical attributes on the board.
6. Look at the critical attributes and derive a rule or a name for the concept.
7. Have students discuss their thinking processes throughout the strategy.

### Examples:

<u>Yes</u>	<u>No</u>
1. Tiger	2. Fish
3. Albino Tiger	4. Lobster
6. Leopard	5. Frog
7. Zebra	8. Shark
9. Giraffe	11. Turtle
10. Rhino	12. Flamingo
13. Whale (twist)	14. Pelican
15. Dog	16. Lizard
17. Bat	20. Lady Bug
18. Otter	
19. Kangaroo	

*All of the “yes” examples represent mammals. The concept rule is that the animals are mammals. Their critical attributes include warm blooded, hair, mammary glands, lungs, and 4 chambered heart. They live on land and water.*

# Concept Attainment: Things That Float



The concept attainment strategy inspires students to use critical thinking strategies to find critical attributes of a given concept. It seems like a game to students, but it actually requires higher level thinking skills.

Show pictures with words or actual objects to present the concept attainment strategy. (Make images legible from a distance.) Sequence the items in the order provided. Always start with a “yes” example. Follow with a “no” example. The additional examples should be given in random order. Do avoid giving too many “no” examples at one time. They are given to help clarify what the “yes” examples have in common.

Finally, never give the concept name to the students. Pull it from them. Also, have them give “yes” examples to verify they know the concept. If they know you have a method to communicate their understanding of the concept without giving the answer, they can communicate they know the pattern. Do not let them give the answer until you ask for it at the end.

## Procedure:

1. Give the examples in the order listed.
2. During the strategy, ask for additional “yes” examples to verify that students are getting the concept.
3. Provide a “twist” to promote higher-level thinking. (Students are lead to think a concept until an example stumps them and causes them to regroup.)
4. Once most students seem to have the concept, ask for critical attributes that describe the concept.
5. List these critical attributes on the board for students to see.
6. Pull for the concept. (If they do not know the name, you can give it; however, if they do know the name, pull for it from the class.)
7. Have students discuss their thinking processes throughout the strategy as they worked to derive the concept. This metacognitive step is not just extra; it is important in the critical thinking process.

## Examples:

YES	NO
1. basketball	2. golf ball
3. volleyball	4. hockey puck
5. beach ball	7. bowling ball
6. tennis ball	8. pool billiard
9. balloon	10. marble
11. log	12. brick
14. sailboat	13. car
16. rubber duck	15. anchor

## Concept Attainment: Palindromes

The concept attainment strategy inspires students to use critical thinking strategies to find critical attributes of a given concept. It seems like a game to students, but it actually requires higher level thinking skills.

Use pictures, words, and/or actual objects to present the concept attainment strategy. Sequence the items in the order provided. Always start with a “yes” example. Follow with a “no” example. The additional examples should be given in random order. Do avoid giving too many “no” examples at one time. They are given to help clarify what the “yes” examples have in common.

Procedure:

8. Give the examples in the order listed.
9. During the strategy, ask for additional “yes” examples to verify that students are getting the concept.
10. Provide a “twist” to promote higher-level thinking. (Students are lead to think a concept until an example stumps them and causes them to regroup.)
11. Once most students seem to have the concept, ask for critical attributes that describe the concept.
12. List the critical attributes on the board.
13. Look at the critical attributes and derive a rule or a name for the concept.
14. Have students discuss their thinking processes throughout the strategy.

### Examples:

<u>Yes</u>	<u>No</u>
1. Dad	2. Brother
3. Mom	4. Sister
6. Pop	5. Cousin
7. Eve	8. Aunt
9. Nun	10. Grandmother
11. Madam	12. Mother
13. Noon	14. Morning
15. Level	16. Roar
18. A Toyota	17. A Ford
19. Able was I ere I saw Elba	
20. Radar	

All of the “yes” examples represent palindromes. The rule is that all words or phrases read the same from the front and the back.

## Concept Development or Inductive Strategy

### Background

The Concept Inductive or Inductive Model emphasizes how concepts are refined. It builds on basic concepts, which are part of the learner's prior knowledge, and as conceptual interrelationships develop, a framework for new understanding is established. The word concept refers not only to the object itself, but also to those attributes that make up one's notion of the object. Jerome Bruner noted that when one sees an object that it is red, shiny and roundish and makes the inference that it is an apple, one is then enabled to infer further that "if it is an apple, it is also edible, juicy, will rot if left unrefrigerated. The working definition of a concept is the network or inferences that are or may be set into play by an act of categorization." Bruner further states, "that virtually all cognitive activity involves and is dependent on the process of categorizing." Hilda Taba originated the concept development model. She emphasized that the mental processes a person employs to select attributes and arrive at his or her idea of what an object is are identical to the processes involved in arriving at more abstract ideas. The model teaches students to make observations, form different types of inferences from these observations, group data on the basis or perceived similarities, then form categories and labels for the data, producing a conceptual system. Taba has identified three inductive thinking tasks and developed these teaching strategies to induce these tasks.

#### 1. Concept Formation

- a. Identifying ideas and associations
- b. Grouping the items based on similarities
- c. Developing categories and labels for groups

#### 2. Interpretation of Data

- a. identifying critical relationships
- b. exploring relationship (regrouping)
- c. Making inferences

#### 3. Application of Principles

- a. Predicting consequences (what should happen if?)
- b. Explaining predictions
- c. Verifying predictions

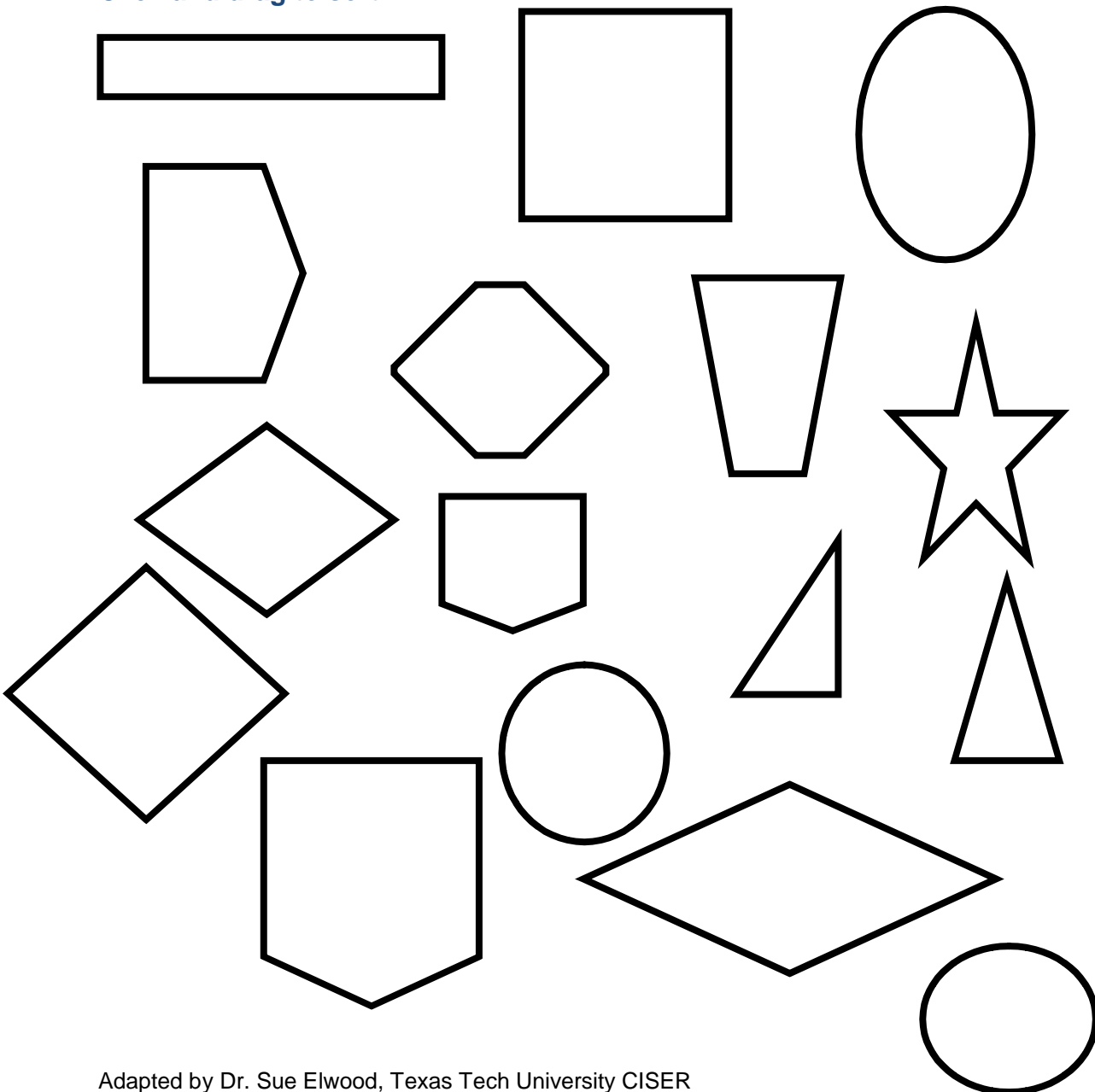
# Sorting by Patterns

Reference: G. Skoog and J. Luch, State University for Teaching, Teacher Education University

## Concept Development Strategy

Sort the objects of this electronic template into groups by patterns you choose. Click and drag the objects. Select titles for the groups. (Group objects into groups that will allow for subtitles falling under a main title.) Summarize why your team grouped the shapes within each document as they did and share the information with the class. Change the title to indicate your grouping. What are the subtitles?

Click and drag to sort.



Adapted by Dr. Sue Elwood, Texas Tech University CISER

# "How Animals Move"

## Concept Development Strategy



**Materials per student or team:** 1 envelope with pictures or die-cuts of animals

Tell students they will look for patterns to see if they can determine the topic for the lesson. Have students sort the provided examples in any way they choose, and explain that all answers are correct. As students engage in the concept development strategy, they should be lead to derive subtitles for the groups and a main title overall. They are looking for the major concept of the lesson. Let students share their grouping ideas and sort the examples again as time allows. After students share their groupings, begin a conversation about the selected topic. If they do not have the groupings desired, lead them to sort the examples into the suggested groups.

The original patterns they choose as they sort examples and their conversations provide insight about their understanding and thinking as well as their misconceptions. Having students sort to look for patterns is a critical thinking strategy for finding the concept.

Swim	Walk	Fly
Goldfish	Cat	Cardinal
Shark	Giraffe	Butterfly
Whale	Human	Bee
Dolphin	Ant	Pelican
Seal	Bear	Bat

Literature Connection: Brown Bear, Brown Bear, What Do you See? Bill Martin Jr.



## Concept Development: What to Wear

Allow students to work individually in teams of 2-4 students or in cooperative teams of 2 students for this activity. Use pictures for the examples listed below. Have children sort the examples in any way they choose, but do not share the concept you are seeking. The goal is to find patterns that have a common theme. Tell the students that all answers are correct. They are building understanding by looking for patterns. Have them share their groupings. If time permits, sort the examples again with new possibilities and have the children share their groupings. If they do not recognize the patterns you are seeking in this activity, guide them to recognize the categories of clothes for different seasons. Next, guide them to recognize groups within the main groups. Some examples will fit into more than one category, which allows children to elaborate as they discuss the appropriateness of clothing for weather.

(For the examples, include more than one possibility under a subtitle to make a group. More examples will also allow children to find additional patterns.) Some possible examples are given below.

<b>Fall</b>	<b>Winter</b>	<b>Spring</b>	<b>Summer</b>
Jersey	Coat	t-Shirt	Swimsuit
Sweater	Slacks	Raincoat	Shorts
Shirt	Cap		Sundress
(Add more Examples)	(Add more Examples)	(Add more Examples)	(Add more Examples)

# Concept Development: Least to Greatest

## "COINS"

Have students work in groups of 2-4 students to complete the Concept Development activity. Make cards with the listed information. (Use actual money for the coins if you choose.) Ask students to group the examples in any way they choose. Give instructions to help them understand that the subgroups should all relate and connect under a general title. The purpose of the activity is to have students look for patterns, so explain that all answers are correct. Students should also derive titles for the groups. Once they find a pattern for grouping the examples, allow students to share with the class the plans for grouping. Finally, lead them into grouping as shown below, ranked from least to greatest. Students can demonstrate the addition of coins if extra coins are provided.

Penny

Nickel

Dime

Quarter

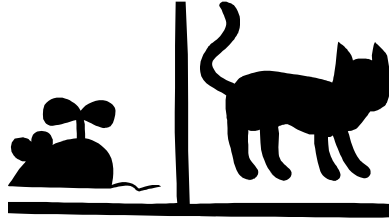
1 cent

5 cents

10 cents

25 cents





## Concept Development: Living vs. Non-living

Allow students to work individually in teams of 2-4 students or in cooperative teams of 2 students for this activity. Use die cuts and/or pictures for the examples listed below. Have children sort the examples in any way they choose, but do not share the concept you are seeking. The goal is to find patterns that have a common theme. Tell the students that all answers are correct. They are building understanding by looking for patterns. Have them share their groupings. If time permits, sort the examples again with new possibilities and have the children share their groupings. If they do not recognize the patterns you are seeking in this activity, guide them to recognize the categories of living and non-living. Next, guide them to recognize groups within the main groups. Living can be sorted into animals and plants. The insects and the children will be a challenge as these topics are some of the most missed questions in testing of grades K-5. This strategy works well as a pre-assessment or a post assessment.

(For the examples, include more than one possibility under a sub-title to make a group. More examples will also allow children to find additional patterns.) Some possible examples are given below.

<b>Living</b>		<b>Non-living</b>	
↓		↓	
<b>Animal</b>	<b>Plant</b>	<b>School</b>	<b>Travel</b>
<b>Dog</b> <b>Cat</b> <b>Duck</b> <b>Butterfly</b> <b>Girl</b> <b>Boy</b>	<b>Tulip</b> <b>Daisy</b> <b>Tree</b> <b>Grass</b>	<b>Book</b> <b>Flag</b> <b>Pencil</b> <b>Scissors</b>	<b>Fire Truck</b> <b>Red Car</b> <b>Blue Car</b> <b>Tow Truck</b>