Effective Teaching Strategies
Nonlinguistic Representations

Waterbury Public Schools
Bilingual/ESOL Education Department

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Bilingual Staff Developer
As a result of this workshop, participants will be able to:

• Understand how nonlinguistic representations enhance students’ understanding and ability to use knowledge

• Know how to apply this instructional strategy in your classroom.
Effective Teaching Strategies
Agenda

Nonlinguistic Representations

- Creating Graphic Representations
- Making Physical Models
- Generating Mental Pictures
- Drawing pictures and pictographs
- Engaging in Kinesthetic Activities
According to research ...
Meta-analysis

• Combines the results of many studies to determine the average effect of a given strategy

• Results are translated as “effect size”
What is an Effect Size?

The *increase or decrease* in achievement of a group exposed to a certain strategy as expressed in standard deviation units, which can be translated into percentiles.
What Does Effect Size Represent?

- An effect size of .20 = small gain
- An effect size of .50 = medium gain
- An effect size of .80 = large gain
<table>
<thead>
<tr>
<th>Category</th>
<th>Average Effect Size</th>
<th>Average Percentage Gain</th>
<th>Number of Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Similarities &amp; Differences</td>
<td>1.61</td>
<td>45</td>
<td>31</td>
</tr>
<tr>
<td>2. Summarizing &amp; Note Taking</td>
<td>1.00</td>
<td>34</td>
<td>179</td>
</tr>
<tr>
<td>3. Reinforcing Effort &amp; Providing Recognition</td>
<td>.80</td>
<td>29</td>
<td>21</td>
</tr>
<tr>
<td>4. Practice &amp; Homework</td>
<td>.77</td>
<td>28</td>
<td>134</td>
</tr>
<tr>
<td>5. Nonlinguistic Representation</td>
<td>.75</td>
<td>27</td>
<td>246</td>
</tr>
<tr>
<td>6. Cooperative Learning</td>
<td>.73</td>
<td>27</td>
<td>122</td>
</tr>
<tr>
<td>7. Setting Objectives &amp; Providing Feedback</td>
<td>.61</td>
<td>23</td>
<td>408</td>
</tr>
<tr>
<td>8. Generating &amp; Testing Hypotheses</td>
<td>.61</td>
<td>23</td>
<td>63</td>
</tr>
<tr>
<td>9. Cues &amp; Questions &amp; Advance Organizers</td>
<td>.59</td>
<td>22</td>
<td>1,251</td>
</tr>
</tbody>
</table>

*Classroom Instruction that Works for English Language Learners (2008)*
95% of what we both teach and say

Teach others the real thing
<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarities &amp; Differences</td>
<td>Strategies that enhance students’ understanding and ability to use knowledge by having them identify similarities and differences among items.</td>
</tr>
<tr>
<td>Summarizing &amp; Note Taking</td>
<td>Strategies that enhance students’ ability to synthesize information and organize it in a way that captures the main ideas and key supporting details.</td>
</tr>
</tbody>
</table>
| Reinforcing Effort & Providing Recognition   | • Strategies that enhance students’ understanding of the relationship between effort and achievement by addressing students’ attitudes and beliefs about learning.  
• Strategies that reward or praise students for attaining goals. |
| Practice & Homework                          | • Strategies that encourage students to practice, review, and apply knowledge.  
• Strategies that enhance students’ ability to reach the expected level of proficiency to a skill or process                                                                                     |
| Nonlinguistic Representation                 | Strategies that enhance students’ ability to represent and elaborate on knowledge using images.                                                                                                            |
| Cooperative Learning                         | Strategies that provide a direction for learning and encourage students to interact with each other in groups in ways that enhance their learning                                                              |
| Setting Objectives & Providing Feedback      | Strategies that help students learn how well they are performing relative to a particular learning goal so that they can improve their performance                                                              |
| Generating & Testing Hypotheses              | Strategies that enhance students’ understanding of and ability to use knowledge by having them generate and test hypotheses                                                                              |
| Cues & Questions & Advance Organizers        | Strategies that enhance students’ ability to retrieve, use, and organize what they already know about the topic                                                                                             |
## Definitions of Categories of Learning Strategies (cont.)

<table>
<thead>
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<th>Category</th>
<th>Definition</th>
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</table>
| Practice & Homework               | • Strategies that encourage students to practice, review, and apply knowledge.  
                                         • Strategies that enhance students’ ability to reach the expected level of proficiency to a skill or process. |
| Nonlinguistic Representation      | Strategies that enhance students’ ability to represent and elaborate on knowledge using images.                                          |
| Cooperative Learning              | Strategies that provide a direction for learning and encourage students to interact with each other in groups in ways that enhance their learning |
The learning strategies are tools for your toolbox and are most effective when implemented purposely, intentionally, and explicitly, or “P.I.E.”:

- **Purposely**- implemented in accordance with recommendations
- **Intentionally**- implemented with sufficient time and intensity
- **Explicitly**- implemented consistently and until success is achieved
EXPLICIT Teaching

4) Independence
   You do, I watch.
3) Practice
   You do, I help.
2) Model
   I do, you watch.
1) Explain
   I talk, you listen.
Conditions for Promoting Literacy Engagement

- Activate / Build Background Knowledge
- Affirm Identity
- Extend Language
- Scaffold Meaning

Literacy Engagement
Literacy Achievement

Jim Cummins (2007)
The Development of Academic Expertise

Teacher-Student Interactions

Maximum Cognitive Engagement

Maximum Identity Investment

Focus on Meaning
- Making Input comprehensible
- Developing critical literacy

Focus on Language
- Awareness of language forms and uses
- Critical analysis of language forms

Focus on Use
- Using language to: Generate new knowledge, create literature and art, and act on social realities
If we truly focused on **Learning**

- What would the **physical layout** of the classroom look like?
- What would I **hear and see** from the students?
- What would we need to **start** doing?
- What would we need to **stop** doing?
Reflecting on My Current Beliefs and Practices- Nonlinguistic Representations

• What is the purpose of representing knowledge in different forms?

• When do I ask students to represent knowledge using forms other than the words?

• What questions do I have about representing knowledge?
Nonlinguistic Representation

Enhance a student’s ability to represent and elaborate on knowledge using mental images.
Generalization from the Research

• Nonlinguistic representation should elaborate on knowledge using **mental images**.

• There are **five** main types of nonlinguistic representations.
Recommendation for Classroom Practice

Student should use:

• graphic organizers
• pictographic representations
• mental images
• physical models, and
• kinesthetic representations
Recommendation for Classroom Practice

• Students should apply nonlinguistic representations to **enhance their content understanding** and talk about their choices to increase academic language.

• Nonlinguistic representations can be **tools for language development.**
Graphic Organizers

Descriptive Pattern

General Topic

Generalization Principle

Example

Example

Example

Example

Characteristic, fact, or Idea

Example

Example

Example
Six common patterns used to organize information are:

- descriptions
- time sequences
- process/cause-effect relationships
- episodes,
- generalizations/principles,
- and concepts
Questions
1. What specific person, place, thing, or event is being described?
2. What are the most important attributes or characteristics?
3. Why are these particular attributes important or significant?
4. Why is the description important?

Use your answers to these questions to form a summary.

Signal Words
above | across | along | appears to be
as in | behind | below | beside
between | down | in back of | In front of
looks like | near | next to | on top of
onto | outside | over | such as
to the right/left | under | adjectives | adverbs
Description Pattern Organizer

- Fact
- Fact
- Fact
- Fact
- Fact

- Topic
Descriptive Pattern Organizer—Capital Resources

- Washing machine
- Things made by people
- Things used to make other goods or to provide services
- Coffeemaker
- Dump truck
- Not used up in the production process
- Used again and again
# Time Sequence Pattern Organizer

## Questions

1. What sequence is being described?
2. What are the major incidents that occur?

Use your answers to these questions to form a summary.

## Signal Words

<table>
<thead>
<tr>
<th>after</th>
<th>afterward</th>
<th>as soon as</th>
<th>before</th>
<th>during</th>
</tr>
</thead>
<tbody>
<tr>
<td>finally</td>
<td>first</td>
<td>following</td>
<td>for (duration)</td>
<td>immediately</td>
</tr>
<tr>
<td>initially</td>
<td>later</td>
<td>meanwhile</td>
<td>next</td>
<td>not longer after</td>
</tr>
<tr>
<td>now</td>
<td>on (date)</td>
<td>preceding</td>
<td>second</td>
<td>soon</td>
</tr>
<tr>
<td>then</td>
<td>third</td>
<td>today</td>
<td>until</td>
<td>when</td>
</tr>
</tbody>
</table>

**Topic:**

![Event Diagram]
**Time Sequence Pattern Organizer**

<table>
<thead>
<tr>
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<tr>
<td>initially</td>
</tr>
<tr>
<td>now</td>
</tr>
<tr>
<td>then</td>
</tr>
</tbody>
</table>
Time Sequence Pattern Organizer

Topic:

Event  -->  Event  -->  Event  -->  Event  -->  Event
Time Sequence Pattern Organizer

Highlights of the Apollo Space Program

<table>
<thead>
<tr>
<th>Year/Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1961</td>
<td>President John F. Kennedy initiates the program</td>
</tr>
<tr>
<td>January 1967</td>
<td>Apollo 1  Crew dies during simulation</td>
</tr>
<tr>
<td>December 1968</td>
<td>Apollo 8  First manned mission to achieve lunar orbit</td>
</tr>
<tr>
<td>July 1969</td>
<td>Apollo 11 First lunar landing mission</td>
</tr>
<tr>
<td>November 1969</td>
<td>Apollo 12 First mission to make a pinpoint landing on the moon</td>
</tr>
<tr>
<td>April 1970</td>
<td>Apollo 13 Explosion on board aborts mission</td>
</tr>
<tr>
<td>January 1971</td>
<td>Apollo 14 Third mission to land on the moon</td>
</tr>
<tr>
<td>December 1972</td>
<td>Final mission of formal Apollo program</td>
</tr>
</tbody>
</table>
Questions

1. What event is being explained or described?
2. What is the setting where the event occurs?
3. When did these event occur?
4. Who are the major figures or characters that play a part in this?
5. List, in the order they occur, the specific incidents or events.
6. What caused this event?
7. What effect has this event had on the people involved?
8. What effect has this event had on society in general?

Use your answers to these questions to form a summary.

Signal Words

<table>
<thead>
<tr>
<th>a few days/weeks later</th>
<th>around this time</th>
<th>as it is often called</th>
<th>as a result of</th>
</tr>
</thead>
<tbody>
<tr>
<td>because of</td>
<td>began when</td>
<td>consequently</td>
<td>first</td>
</tr>
<tr>
<td>for this reason</td>
<td>lasted for</td>
<td>led to</td>
<td>shortly thereafter</td>
</tr>
<tr>
<td>since then</td>
<td>subsequently</td>
<td>this led to</td>
<td>when</td>
</tr>
</tbody>
</table>
## Episode Pattern Organizer

<table>
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</tr>
</thead>
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<td>2. What is the setting where the event occurs?</td>
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<td>3. When did these events occur?</td>
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</table>

Use your answers to these questions to form a summary.

### Signal Words

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<td>when</td>
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</table>
Episode Pattern Organizer

- **Duration**
- **Place**
- **Time**

**Sequence of events**

**Cause** -> **EPISODE** -> **Effect**

**Person**
Episode Pattern Organizer—Tiananmen Square

1989

Public discontent spurred by the death of Hu Yaobang

Tiananmen Square Protest 1989

Hu Yaobang

People's Liberation Army

Deng Xiaoping

Li Peng

Beijing citizens

Workers

Students

Beijing protests a boycott of university classes

May 13

May 20

June 1

June 3-4

June 16

Troops occupy the square

Many people are killed or wounded

Deng Xiaoping claims counterrevolutionaries attempting to overthrow communism are

Widespread arrests, trials and executions

Foreign press banned

Chinese press strictly controlled

2 months

Beijing, China
Generalization/Principle Pattern Organizer

**Questions**

1. What generalization is the author making or what principle is being explained?
2. What facts, examples, statistics, and expert opinions are given that support the generalization or that explain the principle?
3. Are these details written in a logical order? Why or why not?
4. Are these enough facts, examples, statistics, and expert opinions to clearly support or explain the generalization/principle? Why or why not?

Use your answers to these questions to form a summary.

<table>
<thead>
<tr>
<th>Signal Words</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>additionally</td>
<td>although...</td>
<td>always</td>
<td>because of</td>
<td></td>
</tr>
<tr>
<td>nevertheless</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>clearly</td>
<td>conclusively</td>
<td>first</td>
<td>for instance</td>
<td></td>
</tr>
<tr>
<td>for example</td>
<td>furthermore</td>
<td>generally</td>
<td>however</td>
<td></td>
</tr>
<tr>
<td>if... then</td>
<td>In fact</td>
<td>it could be argued that</td>
<td>moreover</td>
<td></td>
</tr>
<tr>
<td>most convincing</td>
<td>never</td>
<td>not only... but also</td>
<td>often</td>
<td></td>
</tr>
<tr>
<td>second</td>
<td>therefore</td>
<td>third</td>
<td>truly</td>
<td></td>
</tr>
</tbody>
</table>
Generalization Principle

Example

Example

Example
Generalization/Principle

Pattern Organizer - Fables

Fables are stories that teach a lesson

“The Fox and the Crow”
Do not trust someone who flatters you

“The Tortoise and the Hare”
Slow but steady wins the race

“The Ant and the Grasshopper”
Get ready today for what you might need tomorrow
Questions
1. What concept is being defined?
2. What are its attributes or characteristics?
3. How does it work, or what does it do?
4. What examples are given for each of the attributes or characteristics?

Use your answers to these questions to form a summary.

Signal Words
<table>
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<tr>
<th>for instance</th>
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<th>in other words</th>
<th>is characterized by</th>
<th>put another way</th>
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<tr>
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<td>that is</td>
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<td>typically</td>
<td>usually</td>
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</tbody>
</table>
**Concept/Definition Pattern Organizer**

<table>
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</tr>
</thead>
<tbody>
<tr>
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<td>3. How does it work, or what does it do?</td>
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<td>4. What examples are given for each of the attributes or characteristics?</td>
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<td>thus</td>
</tr>
<tr>
<td>typically</td>
</tr>
<tr>
<td>usually</td>
</tr>
</tbody>
</table>
Conception/Definition Pattern Organizer

**Modes of Transportation**

- **Used to move products**
  - barges
  - pipelines
  - planes

- **Used to move people**
  - buses
  - trains
  - airplanes

- **Used to move ideas**
  - telephone
  - fax machine
  - computer
Using Other Nonlinguistic Representations

• Making Physical Models
• Generating Mental Pictures
• Drawing pictures and pictographs
• Engaging in Kinesthetic Activity
Pictographs

absolute monarchy

aristocracy

bureaucracy

communism

coup d'état

dictatorship

nationalism

Plebiscite

sultan

totalitarian state

sage

guile

insolence

clarion

unshorn

shroud

tarry

dissolve

pillage

wanton
Student Pictograph
FIGURE 11.8
Pictograph

My Community
Show, Don’t Tell

ACTIVITY
Show, Don’t Tell

- Get in groups and appoint a group leader.
- Get some markers, blank sheet of paper for the group, and one of the vocabulary words.
- Share the word with your group only!
- Draw a visual of the word and figure out a motion for the word.
- Show your visual and motion for the rest of the participants to guess your vocabulary word.
- Then the rest of the class does the motion.
<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astound</td>
<td>To fill with wonder</td>
</tr>
<tr>
<td>Confine</td>
<td>To keep within limits</td>
</tr>
<tr>
<td>Elusive</td>
<td>Hard to describe or understand</td>
</tr>
<tr>
<td>Extinguish</td>
<td>To put out, do away with</td>
</tr>
<tr>
<td>Longevity</td>
<td>A long duration</td>
</tr>
<tr>
<td>Persistent</td>
<td>Refusing to give up</td>
</tr>
<tr>
<td>Remote</td>
<td>Far off in place or time</td>
</tr>
<tr>
<td>Spectacular</td>
<td>Impressive</td>
</tr>
<tr>
<td>Taunt</td>
<td>To insult or ridicule</td>
</tr>
<tr>
<td>Vital</td>
<td>Having to do or necessary</td>
</tr>
</tbody>
</table>
Show, Don’t Tell

collaborate
to work jointly together
Show, Don’t Tell

frugal

reflecting economy
Show, Don’t Tell

divergent

going away from the accepted norm
Pictograph Activity

• In your groups, work quietly to select an event that is currently in the news and represent it using a pictograph.

• Remember that the goal is to form a mental image of the event so you can recall information about it in the future. You will have about five minutes to work on your pictograph.

• Groups will share their product and other groups will guess what event the pictograph represents.
Kinesthetic Activity

Use your arms to demonstrate the following:

• The radius of a circle
• The diameter of a circle
• The circumference of a circle
• An acute angle
• An obtuse angle
• A right angle
Implications for the Classroom

- **Think:** What is one example of a nonlinguistic representation strategy that you have used successfully in your classroom?

- **Pair:** Talk with the person sitting next to you, and share the strategy that you have had success with.

- **Share:** Volunteers to share with the entire group.
<table>
<thead>
<tr>
<th></th>
<th>The student’s representation indicates a detailed understanding of the information important to the topic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>The student’s representation indicates a complete understanding of the information important to the topic.</td>
</tr>
<tr>
<td>3</td>
<td>The student’s representation indicates an incomplete understanding of the topic or misconceptions about some of the information. However, the student shows basic understanding of the topic.</td>
</tr>
<tr>
<td>2</td>
<td>The student’s representation indicates an understanding of the topic that is so incomplete or has so many misconceptions that the student cannot be said to understand the topic.</td>
</tr>
<tr>
<td>1</td>
<td>Not enough information to make a judgment.</td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Score</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>4</td>
<td>The student’s picture shows that she/he understands all of the important information. The picture include some details.</td>
</tr>
<tr>
<td>3</td>
<td>The student’s picture shows that she/he understands all of the important information.</td>
</tr>
<tr>
<td>2</td>
<td>The student’s picture shows that she/he does not really understand the topic. The picture shows some mistakes about the topic.</td>
</tr>
<tr>
<td>1</td>
<td>The student’s picture shows that she/he does not understand the topic. The picture shows many mistakes about the topic.</td>
</tr>
<tr>
<td>0</td>
<td>The student does not try to make a picture.</td>
</tr>
</tbody>
</table>
Planning for Representing Knowledge Worksheet

What knowledge will student be learning?

Will I provide a representation for them or ask them to create their own?

What representing knowledge strategy will I ask students to use?
• graphic organizers
• pictographic representations
• mental images
• physical models, and
• kinesthetic representations
• Other

Do I need to set time aside to teach students the strategy I want them to use?
How will I teach them the strategy?

How will I monitor how well students are doing with the creation and use of nonlinguistic representations?

What will I do to help students who are not using nonlinguistic representations effectively?
I clearly communicate the knowledge students will use to generate representations.

I clearly communicate the strategy that students will use to generate representations.

I make sure students know how to use the strategy that I want them to use to represent knowledge.

Over time, I collect evidence about my student’s proficiency at using a variety of methods to represent knowledge.
• The purpose of this workshop was to ____________________________

__________________________________________________________

According to research, _______________________________________

__________________________________________________________

One important detail is that _________________________________

__________________________________________________________

Another important detail is that _____________________________

__________________________________________________________

________ can also be done by_______________________________

__________________________________________________________

In conclusion, ____________________________________________

__________________________________________________________