Goals

• Enable teachers and specialists to gain a deeper understanding of the essential role of basic concepts across all areas of instruction
• Highlight the Boehm Test of Basic Concepts as one assessment tool and detail how the results can be used
• Provide a systematic model for teaching basic concepts
Basic Concepts

- Basic concepts as defined here are relational concepts such as more-less and same-different that are used across all areas of learning – reading, math, science, writing, following directions, problem-solving, play skills, sports, music, and social interactions.

- These concepts are essential components of the Common Core Guidelines as well as state and local standards. Some examples follow.

Math Examples

I will summarize some specific ways in which basic concepts intertwine into mathematical thinking children need by first grade as they learn to represent and solve problems.
Based on the standardization data of the BTBC-3

**Numbers**

- Counting and building sets of numbers 1-10 in kindergarten
  - such as putting *together* 2 and 5 blocks or taking *away* 5 blocks from 7

- Addition and subtraction using pictures

**Quantities**

- Identifying whether the number of objects in one group is *more (greater than)*, *less than*, or *equal* to the number of objects in another group
- Adding and subtracting pictures or objects “How many do you see all *together*?
- Determining a *part* and *whole* as well as taking things and number sets *apart* and putting them back *together*
Measurement

• Comparing measurable attributes of objects such as *long-short*, *heavy-light* or *tall-short*.
  – This objective might translate into using set lengths of string to measure lengths of objects or experimenting with the weights of different objects

Making Comparisons and Ordering

• Comparing different shapes, sizes, and attributes of things such as the number of sides of shapes that have the *same* or *equal* length or color
Making Comparisons and Ordering

• Determining if one group of objects has more-less objects than another to answer questions such as:
  – “Which pot has more, the most flowers; the fewest flowers (or fewer than the first pot in the row – making the task much more difficult)
Based on the standardization data of the BTBC-3

**Sorting or classifying by type or a particular modifier**

- Sorting by size (*large-small*), length or height (*long-short; tall-short*), weight, or another attribute such as color or how an object feels
- Sorting by more than one attribute ("*all* of the *long* red blocks that are *under* the table")

**Completing patterns**

- Figuring out what thing comes *next* to continue or *finish* a pattern
Time

- Learning how to tell the time from a digital or analog clock
- Determining how much time it takes to complete different activities
- Describing and ordering sequences of events (first, second, next, last)

Navigating in our everyday lives

- Basic concepts are used to describe locations such as near-far; above-below along with other terms such as here and there
- We need to figure out what is in front of or behind or above or below or under us as we do our every day tasks

Based on the standardization data of the BTBC-3
Based on the standardization data of the BTBC-3

Reading Examples

Next we will consider how important basic concepts are for learning to read and engaging in reading (both decoding and comprehension)

Understanding the Format of Books

• Books have a front and back
• You open the front cover to read the book
• Books in English are read from left to right
• You start at the top of the page and work your way to the bottom
Learning to Read and Phonemic Awareness

- Early reading tasks require understanding of basic concepts
  - “Find all the words that start with b”
  - “Which words end in –ing?”
  - “Cat and bat rhyme because they have the same ending”
- Language rules include basic concepts
  - “Silent e at the end of the word makes the vowel long”
    - This is particularly confusing because children have likely learned the concepts of long and short to mean very different things.

Reading Comprehension Strategies

- Teachers may instruct children to mark a passage in order to highlight important components of the text. These strategies often require the understanding of many basic concepts:
  - “Underline the first sentence in each paragraph”
  - “Circle all of the words you do not know”
  - “Make sure to read the title at the top of the page before you begin reading the story”
Reading Comprehension

• Children are often asked prediction and retell questions that include basic concepts of time
  – “What do you think will happen next?”
  – “What happened at the beginning?”
  – “How did the story end?”
  – “What happened before or after another event in the story?”

Following Directions

• A typical state goal by the end of prekindergarten is “Follows 3-step directions (without/with) modeling or a visual prompt”
  – “Wash your hands, choose a book and sit down on the rug.”

Based on the standardization data of the BTBC-3
Based on the standardization data of the BTBC-3

Following Directions

• Children may be told to engage in an action (or be given a visual signal) related to following classroom rules, such as, limiting 4 people to a work area.

• By first grade, children might take timed tasks as they gain fluency with addition and subtraction of single digit numbers and respond to directions when given a problem page, such as, “Stop. Circle the last problem you did.”

Following Directions

The directions we need to follow in life can be simple one- or two-step directions or much more difficult directions that involve only one step that are challenging for many adults such as “Turn left at the second traffic light.”
Emotions and Ideas

- Expressing many feelings, needs and ideas involves basic concepts such as “I liked the story a lot” or “I feel a little tired” or
- Things that you can not see such as “Grandma and grandpa live far away.”

One tool for assessing understanding of a large number of basic concepts

The Boehm Test of Basic Concepts – Third Edition

Based on the standardization data of the BTBC-3
Boehm-3: Preschool

- Assesses 26 concepts at two age levels: 3 years, 4-5 years
- Each concept is assessed twice to identify concepts that are known, emerging, or not yet developed
- Norms and interpretation information are presented by 6-month age bands

BTBC-3: Preschool Record Form

Based on the standardization data of the BTBC-3
The Boehm-3 School Version

- Assesses 50 basic concepts that appear in print materials, school curricula, and verbal instructions
- Can be administered individually or in a group
- Norms are provided by grade level (K-2) for fall and spring to allow for pre- and post-testing to assess within-year progress
- Two parallel forms are available in both English & Spanish

Multiple Uses for the Boehm-3 School Age Version Outcomes

1. **Class Record Form**
   - Allows assessor to review entire class performance
   - Helps assessor identify concepts that are difficult for several children and should be embedded into ongoing instruction
   - Allows assessor to identify concepts that are difficult for specific children and should be addressed through individualized intervention
   - Information on error types can contribute to instruction

2. **Parent Report Form**
   - Presents a list of concepts covered and highlights those the child has not yet developed
   - Provides suggestions for how parent(s) can help their child learn basic concepts at home
Uses for Boehm-3 Scores

- Norm-referenced scores allow the examiner to know if a child is progressing similarly to same-age children by assessing basic understanding of receptive concepts.
- As a criterion-referenced measure, the examiner can analyze errors to differentiate between known, emerging, and undeveloped concepts in order to develop concrete instructional goals.
- As a strategy-based assessment, results can be analyzed with regards to the child’s language background in order to develop interventions for concepts still being acquired and track child progress.

Order of Concept Development

<table>
<thead>
<tr>
<th>Concepts Generally Mastered During the School Year</th>
<th>Preschool (4 years old)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearest</td>
<td>In front</td>
</tr>
<tr>
<td>Tallest</td>
<td>Largest</td>
</tr>
<tr>
<td>Most</td>
<td>Many</td>
</tr>
<tr>
<td>Longest</td>
<td>Different</td>
</tr>
<tr>
<td>Many</td>
<td>Largest</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concepts Still Developing At The End of The Prekindergarten Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom</td>
<td>First</td>
</tr>
<tr>
<td>Smallest</td>
<td>Smallest</td>
</tr>
<tr>
<td>Around</td>
<td>Middle</td>
</tr>
<tr>
<td>Lowest</td>
<td>Lowest</td>
</tr>
<tr>
<td>Together</td>
<td>Together</td>
</tr>
<tr>
<td>Down</td>
<td>Down</td>
</tr>
</tbody>
</table>

Based on the standardization data of the BTBC-3 Preschool
### Order of Concept Development

<table>
<thead>
<tr>
<th>Select Concepts Mastered During School Year</th>
<th>Kindergarten (5 years old)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through Top Always Whole Few Front Starting Over</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concepts Still Developing After Kindergarten</th>
<th>Second Third Never Next Half Center Pair Every</th>
</tr>
</thead>
</table>

Based on the standardization data of the BTBC-3 School

### Activities with Basic Concepts to Promote Success in School

- Teachers and other support personnel at school are key to promoting the skills children need to be successful.
- Since children develop at different rates, the sequence of activities for learning basic concepts need to be geared to the individual child as well as the class as a whole.

Based on the standardization data of the BTBC-3
Teaching Basic Concepts

• The goal is the functional application of basic concepts to school-related tasks across contexts and at increasing levels of difficulty.
• For example, here are some of the many ways beginning and end are used:
  – Stand at the beginning/end of the line
  – Start at the beginning of the top row
  – What happened at the beginning/end of the story (or game, or a video)?
  – The word “cat” begins/ends with what letter?
  – What number is at the beginning/end of a number line?

The Many Uses of Beginning/End

- Of a number line
- Of a line of people or objects
- Of a object, such as a hose or string
- Of the alphabet
- Words that share first or last letters
- Words that share sounds, rhyming
- Story events
How Does Meaning for Basic Concepts Develop?

- Simpler concept words such as *big* and *little* are learned before words with more components of meaning such as *tall* and *short*
- Many children confuse opposite terms.
  - *More* is learned before *less*
  - *Less* is confused with *more*
- This confusion may result for a number of reasons, such as:
  - Frequency of use by adults when talking to children
  - The kinds of objects used (countable/non-countable)
  - The context (space/time/quantity)
  - Overlap with similar words (*fewest/least*)

Teaching Understanding of Basic Concepts

- Basic concepts can be used at increasing levels of difficulty.
- While the foundations for learning these concepts begins during the preschool years, applications at more complex levels continues well into second grade and beyond.
- The framework that follows includes suggestions for activities at increasing levels of difficulty.
- Some can be used in combination, depending on the needs of the student.

Based on the standardization data of the BTBC-3
A Framework for Teaching Basic Concepts

• Concrete and Represented Applications
• Productive Use in the Child’s Own Speech
• Developing Representations in Memory
• Applications at More Abstract Levels
• Using these concepts to express feelings, desires, and needs

A Framework for Teaching Basic Concepts

• Concrete and Represented Applications
  – In relation to the children themselves
    • Through the use of concrete objects in the child’s immediate environment and using their bodies
    • In photographs or pictures
    • On the printed page
    • In video presentations

Based on the standardization data of the BTBC-3
A Framework for Teaching Basic Concepts

• Productive Use in the Child’s Own Speech
  – By encouraging children to describe attributes of objects and situations
  – By introducing and using related terms
    “beginning/start”
    “same/alike”
  - By introducing the word “opposite” and encouraging children to use comparative terms such as “big, bigger, biggest, huge”

• Developing Representations in Memory
  – By encouraging children to close their eyes and form mental pictures of concepts and then describe them.
  – The goal is to have children gain a representation that they can remember and use in new situations
A Framework for Teaching Basic Concepts

• Applications at More Abstract Levels
  – In reversing
    • The application of many concepts can be reversed in time or space
    • The toy to the right of the child can be moved to the left of the child
    • The jar can be flipped so that the top is now on the bottom
    • The cars can be moved so that the middle car changes position or so that there is no middle car

A Framework for Teaching Basic Concepts

• Applications at More Abstract Levels
  – In comparing
    • Concepts are used frequently to make comparisons
    • “Which car is nearest to the tunnel?”
    • “Find the box with the fewest toys.”
A Framework for Teaching Basic Concepts

• Applications at More Abstract Levels
  – In sequencing
    • Many basic concepts can be used to order relationships
    • “Which box has a few balls and which has many?”
    • “Put the leaves in order from the widest to the narrowest.”
    • “Put the books in order from shortest to tallest.”

A Framework for Teaching Basic Concepts

• Applications at More Abstract Levels
  – In classifying
    • Basic concepts are often a qualifier to classify objects or situations that represent the same relationship. This relationship can range from easy to very difficult.
    • “Find all of the boxes that are big.”
    • “Find all of the children who have their right hand up.”
A Framework for Teaching Basic Concepts

• Applications at More Abstract Levels
  – In combination with other concepts
    • The ability to respond to multiple-part directions is essential in school learning and to the student’s cognitive development
    • Many factors are involved in complying with directions including the number of behavior steps and the number of qualifiers used. Many of these qualifiers are basic concepts.
      – Find all of the blocks that are big
      – Find all of the blocks that are long and red
      – Find all of the long, red blocks under the table

• Across All Levels
  - Encourage use of many concepts to express feelings and ideas at simple and more sophisticated ways
    After playing with her father a child says “I love you very, very, very much. Did I say enough “verys” daddy?”

Based on the standardization data of the BTBC-3
Teaching Tips

- Label and define the target concept
- Use a puppet to help model the concept
- Give lots of examples – ones that the student will remember
- Apply target concepts frequently in everyday activities across contexts
- Emphasize concepts through gesture and tone of voice
  - Make it fun!
- Make funny mistakes that the student can recognize
- Use cues to help students retrieve the concept term

More Teaching Tips

- Give hints, prompts, and feedback
- Help students make connections to new situations
- Have “reminder” picture cards
- Post words
- Provide lots of practice each day in conversations with new examples
- Encourage student to say the concept word and set up situations students can observe and describe
More Teaching Tips

- Make up songs and sayings to encourage retention of key concepts
  - *More* means *greater than, many, a lot*
  - *Less* means not as *many, fewer than*, maybe only two
- Read books that incorporate target concepts
- Revisit target concepts over time and incorporate them in more complex situations or activities
- Send home activity suggestions
  - Photos of books with target concepts
  - For dual language learners, send home words in both languages; attach an illustration or photo

What Teachers and Specialists can do

- To summarize: Four basic objectives include helping learners
Parent Generated Ideas for Teaching Quantity

**Most, More, Less, Least, & some but not many..**

Use these words frequently when
- playing with Legos, blocks, or small toys
- playing games using money or coins
- watching a sport (e.g. baseball, basketball) together
- cooking or eating a meal/snacks together

Parent ideas for questions to use at home while teaching these concepts

While you engage in suggested activities, use many questions to help your child expand their understanding of the concepts related to quantity.

- Which team has **more** points? Which team has **less** points?
- Which pile has the **most**? Which pile has the **least**? How do you know?
- Who has the **least** amount of **** left in their dish?
- Would you prefer to have **more** cheerios or finish the little amount of the granola?
- Who eats **more**? (list people at the table)
Based on the standardization data of the BTBC-3

More ideas for teaching basic concepts at home

• Use important math concepts as part of everyday life
  – Measuring while cooking and following steps in order to make a favorite dish
  – Helping to sort forks and spoons to be put away
  – Sorting pairs of socks or your socks and dad’s socks
  – String pasta or beads of different shapes or sizes in a particular order

• Take pictures when you can and form your own books of these activities

Selected References