

Teaching BCSs and related basic concepts in Preschool, Kindergarten and Grade 1 as a preventive measure – the "Curriculum" version

Words denoting Basic Conceptual Systems	Institution/grade	Words denoting relevant Basic Concepts	Comments
1. Color Please notice: The concepts “completely similar/-alike” and “similar in” should be taught before starting with tasks in phase 3: Selective generalization of the Concept Teaching Model, cf. Chapter 3 and the subchapter " <i>Phase 3 of the CTM: Selective Generalization or discovering and verbalizing partial similarities.</i> "	Preschool (4-year old students)	Red, blue, green, yellow, brown, black, white.	Drawing-pad. Crayons, etc. Colors – inside and outside, included changes in color that occur in nature during the various seasons. Note: Even if BCS-Change in ... is listed as BCS # 19, the application of it already starts from BCS-Color.
	Kindergarten and First grade students (Elementary school)	Teaching of more colors, e.g. pink, violet/purple and orange. Also repetition of learned colors in varying contexts.	Mixing colors – observe and talk about how they change.
2. Shape	Preschool (4-year old students)	Straight line, round, curved/bowed, triangular, four-sided, cubic, spherical	Various materials. Shapes found or made inside and outside.
	Kindergarten and First grade students (Elementary school)	Teaching of circular, oval, conical, cylindrical shape etc. Also repetition of previously taught concepts by application in various contexts, or possibly by means of the Concept Teaching Model, if regarded as necessary. <i>Possible repetition and further elaboration of Shape as a</i>	Shape concepts suitable for describing letters and numbers are repeated, especially in connection with teaching reading, writing and mathematics.

		<i>Basic Conceptual System via various applications of the inventory of Basic Conceptual Systems above and in Chapter 4.</i>	
3. Position	Preschool (4-year old students)	Horizontal, vertical diagonal/slanting/sloping, standing, lying, sitting, kneeling, etc. The first three concepts must be taught via the Concept Teaching Model	Plumb with a string attached for demonstrating vertical position and a bottle with colored water for demonstrating horizontal position
	Kindergarten and First grade students (Elementary school)	Horizontal, vertical, diagonal/slanting, Repetition of the other concepts by application in varying contexts.	Repeated in connection with teaching reading, writing and mathematics.
4. Place (in relation to something else) with reference to spatial orientation and Place (in relation to something else) with reference to temporal orientation	Preschool (4-year old students)	Place on, under, over, between, in front of, after, behind, first, last.	Repeated in connection with teaching reading, writing and mathematics, etc.
	Kindergarten and First grade students (Elementary school)	Place on, under, over, first and after/next in a row or sequence (with reference to both spatial and temporal orientation) beside/by the side of, to the left of, to the right of. Also repetition of other concepts and further elaboration of Place as a Basic Conceptual System via various applications. Application of learned concepts as tools for teaching in varying contexts.	

5. Sizes	Preschool (4-year old students)	<p>Large and small in size. (larger, smaller, largest, smallest).</p> <p>Height and Length.</p> <p>Tall (large in height, Short (small in height). (Taller, shorter, tallest, shortest).</p>	<p>Objects etc. which differ in sizes; height and length, cf. lesson 11 on the SCTR website: Size – "Large height (tall) in relation to".</p>
	Kindergarten and First grade students (Elementary school)	<p>Repetition of sizes such as height and length, plus introduction/presentation of other subsystems within Sizes; width/breadth and depth.</p> <p>Possible repetition and further elaboration of Sizes as a Basic Conceptual System via various applications of concepts.</p>	<p>Height and length are relevant for descriptions of letters and numbers, etc.</p>
6. Direction	Preschool (4-year old students)	<p>Up/upwards, down/downwards, from the right to the left, from the left to the right.</p>	<p>Cf. the lesson 37 on the SCTR website: "Direction - from the left to the right".</p>
	Kindergarten and First grade students (Elementary school)	<p>Repetition of concepts plus introduction of more concepts such as forwards, backwards, alongside/beside, inwards, outwards, in/into, out of, toward, away from.</p> <p>Compass directions: to the North, South, East and West.</p>	<p>Up/upwards, down/downwards, from the left to the right, from the right to the left are repeated in connection with teaching reading, writing and mathematics, among other things because they are important as tools when teaching how to write/form letters and numbers.</p>

<p>7. Number</p>	<p>Preschool (4-year old students)</p>	<p>(Group) Large/small number in relation to...</p> <p>Groups of one, two, three, four, five (possibly larger numbers). The total number in a group (cardinal number) is found by counting and then being named by numbers as well as symbolized by numerals (written numeric symbols, e.g. 1, 2, 3, etc.).</p> <p>Changing the number in a group:</p> <p>Increasing the number of a group by adding one more, two more, etc.</p> <p>Decreasing the number in a group by subtracting (taking away) one, two, etc.</p>	<p>Cf. lesson 8 on the SCTR website: "General – In a group".</p> <p>Cf. lesson 18 on the SCTR website: "Number – number 3". In this program five proposed counting strategies for finding numbers are listed (regarding the cardinal aspect): (1) counting while moving, (2) counting while touching, (3) counting while pointing, (4) counting while nodding, and (5) counting while only looking at...</p> <p>It is also important to help children learn to count by heart, e.g. from one to ten, from ten to twenty, etc. There are a lot of fairytales which imply counting that is suitable for this purpose.</p>
	<p>Kindergarten and First grade students (Elementary school)</p>	<p>Repetition of concepts related to number and further elaboration of number as a Basic Conceptual System via various applications, also the concept of ones and tens, more of addition and subtraction, and the positional system, etc.</p>	<p>Numerals (numeric symbols) for cardinal numbers and for ordinal numbers symbolizing "place in a row or sequence" – e.g. (1) 1st, (2) 2nd, (3) 3rd etc.</p>

		<p>Possible repetition and further elaboration of concepts related to Number – BCS.</p>	<p>Symbols for mathematical operations (+, -) and relational symbols, such as (> = <).</p>
8. Sound – Speech sound/phoneme	Preschool (4-year old students)	<p>”Sounds” in general: Strong, weak, low in pitch/deep, high in pitch/high etc.</p> <p>Sounds in nature: sounds made by animals, the sound of birds singing, the sound of the wind blowing, etc.</p> <p>The concept ”Speech sound” (phoneme) in spoken words. Learning to decide which speech sounds that words start with (that occur first in a spoken word).</p>	<p>Sounds in the near surroundings, sounds from instruments, clapping, knocking sounds, etc.</p> <p>Cf. lesson 25 on the SCTR website: ”Speech sound”.</p> <p>Cf. lesson 26 on the SCTR website: ”Place - first in a sequence in relation to ...”.</p>
	Kindergarten and First grade students (Elementary school)	<p>Possible repetition and further elaboration of relevant concepts in varying contexts.</p> <p>Developing awareness about the fact that speech sounds can be symbolized by letters.</p> <p>Learning to decide which speech sounds that words start with (occur first in a spoken word) and which speech sounds come next in the sequence of sounds in words.</p>	<p>Usually the formal teaching of the associations between a (1a) speech sound and its (1b) articulation, on the one hand, and the (2) letter, on the other hand, takes place in kindergarten and grade 1? (often inadequately referred to as letter-sound correspondence).</p>

		<p>(Developing awareness about the fact that the articulation of each speech sound can be “felt” in the mouth while simultaneously heard in the ear, and learning to apply this insight as a strategy to break a word into its separate sounds).</p> <p>Learning that reading in the first stage might be explained as ”saying the speech sounds (symbolized by the letters) without stopping between them, in order to hear which word it makes”</p>	<p>Cf. lesson 27 on the SCTR website: "Place right after ...".</p>
9. Surface Pattern/design	Preschool (4-year old students)	Dotted/spotted, striped, checkered, flowered (surface) pattern	Fabrics with different patterns
	Kindergarten and First grade students (Elementary school)	Possible repetition and further development of (Surface) Pattern / Design as a BCS in varying contexts.	
10. Use or Function	Preschool (4-year old students)	The teachers/staff talk about the use or function of things as part of ordinary/every day conversations. What objects are usually used for – used to draw with, drink from, play with, sit on, eat with, etc.	Cup, glass, pencil, scissors, toys, etc.
	Kindergarten and First grade students (Elementary school)	Possible repetition and further elaboration of Use as a Basic Conceptual System via various applications.	

11. (Kinds of) Substances/ Materials	Preschool (4-year old students)	Wood, paper, plastic, glass, fabric, leather, metal substance	Things/objects made of glass, metal, plastic, wood, etc.
	Kindergarten and First grade students (Elementary school)	<p>Repetition in varying contexts and teaching of more concepts belonging to Substances / Materials – Kinds of – as a Basic Conceptual System, e.g. different kinds of metal.</p> <p>Possible repetition and further elaboration of Substances / Materials – Kinds of – BCS.</p>	
12. Surface properties of Substances/ Materials	Preschool (4-year old students)	Smooth, rough, matt, shiny/glossy surface.	Things/objects made of glass, metal, plastic, wood, etc.
	Kindergarten and First grade students (Elementary school)	<p>Repetition in varying situations and teaching of more concepts within the BCS in question, such as sanded, polished, painted, varnished, lacquered, etc.</p> <p>Possible repetition and further elaboration of</p> <p>Surface Properties of Substances / Materials Attributes of the Surface – BCS.</p>	
13. Physical properties of Substances/ Materials	Preschool (4-year old students)	Hard/firm, soft, breakable, liquid, heavy, light substance.	Cotton, metal, wooden sticks, modelling clay, etc.
	Kindergarten and First grade students (Elementary school)	Repetition in varying contexts and teaching of more concepts such as firm, elastic, inelastic, transparent, etc.	

		<p>Possible repetition and further elaboration of</p> <p>Substances / Materials — Physical properties of ... — BCS.</p>	
14. Weight	Preschool (4-year old students)	<p>Heavy or light in weight compared to something else, e.g. a pencil or a box of paints, etc.</p> <p>Weighing of objects.</p> <p>For instance, the application of 1 kilogram (1000 g) as a weight unit (different kinds of things weighing 1 kilo are presented).</p>	<p>The children are invited to compare two sets of objects – a set of objects that are heavy versus a set of objects that are light. Make arrangements to help the children detect and verbalize the fact that there need not be a firm and exact correlation between size and weight, e.g. the weight and size of a little plumb made of lead compared to the size and weight of a larger ball of yarn, etc.</p>
	Kindergarten and First grade students (Elementary school)	<p>Repetition in varying contexts and teaching of more concepts belonging to Weight as a Basic Conceptual System, e.g. Kg, hg, g etc.</p> <p>Weighing and comparing the different weights of objects. The weight of children.</p> <p>Repetition in varying contexts and further elaboration of Weight as a Basic Conceptual system.</p>	

15. Temperature	Preschool (4-year old students)	Cold/low and warm/high Temperature as related to ..., cool, freezing cold, boiling hot, lukewarm.	Water and other liquids and things outside and inside with different temperatures.
	Kindergarten and First grade students (Elementary school)	<p>Repetition in varying contexts and teaching of more concepts such as degrees of heat and cold, etc. Learning to determine the number of centigrade and degrees of Fahrenheit by means of measuring devices.</p> <p>Possible repetition and further elaboration of Temperature as a Basic Conceptual system.</p>	Measuring devices.
16. Smell	Preschool (4-year old students)	Pleasant/nice and unpleasant/nasty smells, smells from nature, the smell of different kinds of food, the smell of different kinds of fruit, e.g. apple-taste, orange-taste.	The immediate surroundings. Food including fruit.
	Kindergarten and First grade students (Elementary school)	<p>Repetition in varying contexts and further elaboration of Smell as a Basic Conceptual System, e.g. the smell of gasoline, the smell of rotten plants, etc.</p> <p>Possible repetition and further elaboration of Smell as a Basic Conceptual System</p>	The immediate surroundings.
17. Taste	Preschool (4-year old students)	Sour, sweet, salty Taste, apple-taste, orange-taste.	Food including fruit for tasting.

	Kindergarten and First grade students (Elementary school)	<p>Repetition in varying contexts and further elaboration of Taste as a Basic Conceptual System, e.g. bitter, meat-taste, lemon-taste, etc.</p> <p>Repetition in varying contexts and further elaboration of Taste as a Basic Conceptual System.</p>	
18. Time	Preschool (4-year old students)	Day, night, morning, afternoon, evening, the seasons: Summer, Autumn/Fall, Winter and Spring.	
	Kindergarten and First grade students (Elementary school)	<p>Repetition in varying contexts and teaching of more concepts such as the days of the week, the months of the year (January, February, March, etc.), year, the present (time), present tense, the past (time), past tense, the future (time), future tense.</p> <p>Learning to tell time.</p> <p>Possible repetition in varying contexts and further elaboration of Time as a Basic Conceptual System.</p>	<p>The natural surroundings.</p> <p>Parts of day and night, the seasons.</p> <p>Hour glass, stopwatch, calendar.</p>
19. Change in color, shape, size, position, place, surface pattern, etc.	Preschool (4-year old students)	In color, in shape, in position, in place(ment), in number, in temperature, in time: e.g. the seasons, the parts of day and night, etc.	<p>The natural surroundings – changes in color.</p> <p>Changing color by mixing colors together.</p> <p>To boil water. What happens to water when the temperature sinks</p>

			below the freezing point?
	Kindergarten and First grade students (Elementary school)	<p>Possible repetition in varying contexts of Changes in color, shape number, pattern, direction, etc.</p> <p>Possible repetitions and further elaboration of Change in... as a Basic Conceptual System.</p>	Measuring the height of the children.
20. Speed/ Movement	Preschool (4-year old students)	Fast (high speed), slow (low speed) (faster, fastest, slower, slowest) in relation to ...	<p>Toy cars etc.</p> <p>Observations of real cars driving, airplanes in the air, birds flying, people walking, running, cycling.</p> <p>Children and physical activities.</p>
	Kindergarten and First grade students (Elementary school)	<p>Repetition in varying contexts and teaching of more concepts such as increasing speed /accelerating speed, decreasing speed/ decelerating.</p> <p>Possible repetition and further elaboration of Speed as a Basic Conceptual System, e.g. the speed of cars in terms of xx kilometer per hour, the wind blowing/moving with a speed of xx knots per hour/meter per second. Names of wind forces; Light breeze, moderate gale, storm, etc.</p>	

21. Value/ Worth	Preschool (4-year old students)	Right – wrong evaluations. The value of money.	
	Kindergarten and First grade students (Elementary school)	Right – wrong evaluations. The value of money. Possible further elaborations of Value as a Basic Conceptual system.	