Never *Too Young* for a CONCEPT MAP

With adaptation, concept maps can be effective tools for preschool/primary students to organize thoughts and connect concepts visually.

When we think of a *concept map,* we usually think of a chartlike graphic that describes a concept and its various relationships, with general concepts at the top, specific supporting concepts toward the bottom, and words and lines showing the connections and flow between the concepts. We think of concept maps as tools for teachers of upper elementary students—students who have good reading and writing skills. We *don't* think of them as something that is appropriate for early childhood learners. But, they can be.

Concept mapping can be adapted for preschool/primary students, providing young children with many of the benefits it does their older counterparts. For example, children are provided with opportunities to see logical connections with new material and previously acquired knowledge. Also, concept mapping promotes critical-thinking skills through the use of observation, comparison, classification as well as problem solving and decision making. In addition, teachers can use concept maps to introduce or conclude a topic or as an activity within a lesson/unit, and they provide teachers with valuable information in assessing students' learning progress.

Here are suggested lessons that model the process of building concepts maps with young students. Students in my early childhood and elementary science methods classes developed and implemented these lessons on five senses and nutrition as part of their coursework—but, they'll be equally successful in your classroom, too.

By Nancy L. Gallenstein

Adapting the Map

The concept map for young learners uses manipulative objects or pictures appropriate for children's level of development. Rather than using only words (symbolic/abstract level), young children can create concept maps by arranging objects (concrete level) and/or pictures (pictorial level) in a format with general concepts at the top and supporting concepts positioned below them.

Connections can be made between concepts through the use of laminated paper arrows, string/yarn, pipe cleaners, etc. The teacher can write the children's suggested linking words on the laminated arrows as they share their thoughts. The arrows show the flow of ideas on the concept map and provide students with opportunities to "read" the completed concept map story for understanding. Students can also make new connections by rearranging the items, allowing for diverse perspectives to be expressed.

Very young children will experience success with concept maps with three-dimensional objects or pictures. As students' literacy skills progress, however, teachers can build more complex concept maps with objects, pictures, picture word cards, and words only. In addition, software programs, such as *Kidspiration* (see Internet Resources), provide opportunities for children to create concept maps with pictures or words.

The examples that follow should give you ample practice building concept maps. Once you experience the process, I'm sure you'll be building concept maps with students on many other topics as well.

Getting a Sense of It

Following a unit on the five senses, one first-grade class created a concept map as a whole-group assessment. The teacher introduced the activity to students by telling them they were going to "tell the story" of the five senses. Their lesson scenario is described below.

Topic: The Five Senses
Grade Level: Preschool–Second Grade
Materials:

- Picture of a young child with lines drawn to an eye, an ear, the mouth, the nose, and a hand
- Plastic mouth, ear, eye, nose, and hand
- Various items that children can taste, touch, smell, see, and hear, such as cinnamon, vinegar, fur, sandpaper, sour candy, toothpaste, photograph, a flashlight, a CD, and musical instruments
- Large blanket

Procedure:

Introduction. Lay all of the materials on the blanket and ask the children to describe how the items are related. If children appear to be overwhelmed with the number of materials, start with a set of materials that the students could successfully classify (sort/group). Typically, students comment that all of the objects can be seen. Assure the students that they are correct and ask them what other ways they could identify the objects. Students usually respond that they can smell certain items. Ask them to share what items they could smell. Continue this format through the remaining five senses. Explain to the students that they are going to use these items to "tell the story" of the five senses.

Hold up the picture of a child and—while pointing to the lines drawn to the specific body parts—ask the children to think about what they recently learned in science about their bodies. The children will probably volunteer, "the five senses."

Place the picture of the child at the top of the blanket. Below the picture, place a strip of paper that reads, "Body parts are... ." This will provide the main connecting link from the picture of the body to the actual plastic body part objects. Explain to the students that they will be using arrows to help connect the objects (concepts/ideas) to tell the story of the five senses.

Creating the map. Ask students to name one of the body parts used for our five senses. One by one, have five different children find the plastic item (i.e., eyes, ears, nose, mouth, hands) that matches the body part that was shared and place the item in a horizontal row below the illustration on the blanket, placing the arrows (vertically downward) to "map the path" from the illustration to each body part.

Next, discuss what we do with our eyes, our mouth, our ears, our hands, and our nose. Students will say, "We see with our eyes, feel with our hands, etc."

Delve deeper into each sense by asking specific questions about each sense. For example, ask the children to think of things they like to hear and to share their ideas. Students usually comment that they like to hear music (musical instruments and singing), people laughing, birds' chirping, etc. After their comments, ask a student to choose an item from the blanket that fits the sense of hearing. Position an arrow vertically below the ear and place the plastic ear at the tip of the arrow. Additional things to hear can be placed under the plastic ear for the sense of hearing. Repeat the above process for each sense, until all the children have had an opportunity to place and connect various items under their appropriate body part/sense.

Telling the story. When all the items are placed, the map is completed and it is time for students to "tell the story" of their five senses to their classmates—starting at the top of the map (picture of child) and following the arrows down the map. Model an example by reading part of the map. Start at the top so the children will have an understanding of what you would like for them to share. A student would typically share that there are five body parts we use for our five senses. We use our mouth to taste food, candy, toothpaste, etc. During the construction of

the map, children usually share that we can use more than one sense to identify many of the objects. Inform them that they are correct and that the map can be created in more than one way. When finished reading the concept map, allow the students to suggest other arrangements for the objects. Again, allow them to read their revised story for the five senses.

Extensions:

- Place the concept map materials in a learning center for children to practice connecting related concepts about the five senses.
- Have children draw pictures of what they like to do with their five senses and add them to the concept map.
- Have children bring objects or pictures from home about the five senses to add to the class concept map.

Evaluation:

In creating the five senses concept map, students have an opportunity to organize their thoughts from general to specific in a developmentally appropriate concrete format. Students are actively involved in the learning process by observing and classifying information while manipulating the provided objects. By working cooperatively, students have an opportunity to hear their classmates' thoughts, which provided them with more than one perspective on how the objects could be connected.

Using three-dimensional objects, young children can create developmentally appropriate concept maps. Shown here is a map that explores the concept of balanced meals.

Concept maps are excellent evaluation tools. Teachers can use them as pre- and/or post-assessment instruments. In this case, the teacher is able to hear students' concept connections concerning the five senses. Gaps in understanding and misconceptions can be detected and clarified. Additionally, language skills are strengthened and various perspectives are valued.

The Map to Nutrition

In a second example, kindergarten students created a concept map to share their knowledge about good nutrition. For this map, students used play food, food picture cards, and paper plates and string to sort food and "make" balanced, healthy meals. As in the previous example, this lesson was conducted following a class study.

When students are initially introduced to concept mapping, additional time is necessary to explain the purpose and format of concept maps. Informing the students that they will play a game by connecting objects that are alike can set the stage for sorting/grouping. Once children have experience with concept maps, students eagerly begin to mentally classify concepts and quickly progress to arranging the objects/pictures in an organized format.

Students' nutrition lesson scenario is described below.

Topic: Food Groups/Balanced Meals
Grade Level(s): Preschool–First Grade
Materials:

- Play food representing the five major food groups (grains; vegetables; fruits; milk and other calcium-rich foods; and meat, fish, beans, eggs and nuts), plus sweets/junk food
- Picture cards representing the five major food groups and sweets/junk food
- Paper plates
- Yarn, string, or crepe paper for concept links
- Stuffed Cookie Monster
- Lunch box (empty)

Procedure:

Teacher's role. The teacher engages students by holding up the Cookie Monster doll and asking whom he is and what he likes to eat. Usually, children excitedly shout, "Cookie Monster!" and "Cookies!" amid much laughter and cheers.

The children then discuss Cookie Monster's eating habits and what foods might be more appropriate for him to eat. They usually suggest food items that are a part of their regular diet such as sandwiches, macaroni, fruit, pudding, juice, milk, etc.

Next, the teacher holds up an empty lunch box and asks students to help Cookie Monster pack a healthy

Connecting to the Standards

This article addresses the following *National Science Education Standards* (NRC 1996):

Teaching Standards

Standard B:
Teachers of science guide and facilitate learning.

Standard C:
Teachers of science engage in ongoing assessment of their teaching and of student learning.

Standard D:
Teachers of science design and manage learning environments that provide students with the time, space, and resources needed for learning science.

lunch by sorting through the bucket of play food items. The teacher informs the children that the picture food cards will be used to separate the two types of food items (healthy/unhealthy or a sometime food). The paper plates will be used as the containers where they will place the two different groups of food items. And, the yarn/crepe paper will be used to connect the Cookie Monster to the picture cards as well as the plates of healthy and unhealthy/sometime food groups.

Students' role. With the teacher's guidance, the children sort through the picture food cards and discuss which food groups are healthy or not healthy. Young children typically respond that sandwiches and fruit/vegetable items are healthy and that sweet items (candy) and junk food (chips) are not healthy. After discussing each picture card, students should place the cards in a horizontal row on the floor or on a large table below the Cookie Monster and his empty lunch box. (*Note:* Place items where ALL children can be participants in the concept mapping activity.)

Children then discuss whether each play food item is healthy or not. Place the paper plates below the food cards (one plate per food card) so the children can place the play food on the appropriate food card category (e.g., place all fruits/vegetables on the plate below the fruits/vegetables food card; all sweets/junk food under the sweets/junk food card, etc.

Children then pack a balanced, healthy meal for the Cookie Monster by placing an assortment of healthy play food items in the empty lunch box.

After the children have packed a healthy meal for the Cookie Monster, they should be encouraged to share other healthy meals that they have eaten and discuss if they would be appropriate for the Cookie Monster, too. Then, follow the path of the concept map starting with the Cookie Monster at the top. Review the two types of food items on the plates by emphasizing the importance of appropriate eating habits.

Extensions:

- Have children choose and pack different, balanced healthy meals for the Cookie Monster by placing another assortment of healthy play food items in the empty lunch box.
- Have students pack meals for breakfast, lunch, and dinner. Ask children to include additional food items not present. Students can draw pictures of the new foods they think of.
- Place the materials in a learning center for students to practice building new, healthy meals.

Evaluation:

In creating the nutrition concept map, children have an opportunity to work with an enjoyable and familiar character. Through the use of a concrete format, children observe, manipulate, and classify materials, while connecting their thoughts visually. And, by working cooperatively, students have an opportunity to strengthen their interpersonal, problem solving, and decision-making skills.

The teacher is able to assess the children's working knowledge of a balanced healthy meal. As the children share what they consider to be healthy food items and balanced meals, the teacher develops a better understanding of what his/her role would be in reinforcing healthy eating habits.

Making concept maps through activities like these engages children actively in their learning as they manipulate materials and organize their thoughts in a visual way. Students usually are so involved in the activities, they don't notice they are practicing grouping and sorting skills and developing observation and critical-thinking skills. Teachers, too, will find the experience useful as they evaluate their children's concept connections and determine the steps necessary for further learning. ■

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Resources

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Internet

Inspiration Software, Inc.
http://www.inspiration.com/productinfo/index.cfm

USDA MyPyramid.gov
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