



## **PROBLEM SOLVING**

# **Early Problem Solving Indicator (EPSI)**

### **Administration Guidelines**

**Problem Solving General Outcome:** Child solves problems that require reasoning about objects, concepts, situations, and people.

## Early Problem Solving Indicator (EPSI) Administration Guidelines

### Introduction

The Early Problem Solving Indicator (EPSI) assessment is designed to measure infants' and toddlers' growth in solving problems that requires reasoning, interpreting and using concepts, adapting to stimulating situations, and interactions with people. The specific elements of problem solving measured by the EPSI are Looks, Explores, Functions, and Solutions. The frequency of each problem solving element is measured, and then the scores are added together to obtain a total problem solving score. The EPSI has two forms, each of which includes three sets of toys (stacking cups, pop-up toy, and ball machine), and involve the child playing with toys along with a familiar adult.

### Setting up the EPSI Testing Situation

The adult and child should be in an area that is comfortable for them where they can play with the materials. They can sit on the floor or at a table. Toys are presented one at a time, so the toys that are not being used at the moment need to be accessible, but out of the child's view (e.g., keep them in a bag).

If a child is **not independent** in sitting, the following options can be used for positioning:

1. Seated position in a boppy or bolster
  - make sure toys are in front of and within reach of the child
  - support feet with block or bolster
  - use a blanket or towel to support child's back if needed
2. Seated position and held by adult play partner (or other adult if needed)
  - make sure toys are in front of and within reach of the child
  - play partner should be able to have eye contact with child
3. Sitting position on the floor – propped by examiner to sit up (child may be held on play partner's lap, or child's back may be resting against adults leg)
  - make sure toys are in front of and within reach of the child
  - play partner should be able to have eye contact with child
  - place a blanket/towel under child if needed for cleanliness or warmth
4. Sitting position on the floor – propped by examiner to rest on tummy (child is placed on a bolster or floor)
  - make sure toys are in front of and within reach of the child
  - play partner should be able to have eye contact with child
  - place a blanket/towel under child if needed for cleanliness or warmth

If a child is **independent** in sitting the following options can be used for positioning:

1. Sitting position on the floor

- make sure toys are in front of and within reach of the child
- play partner should be able to have eye contact with child
- place a blanket/towel under child if needed for cleanliness or warmth

### **Materials**

Set up each of the toys so the child can easily see and reach the toy, but so only one toy is visible and accessible to the child at a time. Present toys in the following order: (1) Pop up toy, (2) Stacking cups, (3) Ball machine. Rotate between alternate toy forms from one session to the next to maintain the child's interest in the toys.

### **Video Camera**

Set up the camera so the play area is in view – ensure that the child, toy, and play partner are in view. The camera operator should stay as still as possible as to not distract the children or assessor. It is recommended to mount the camera on a tripod that allows fluid motion of the camera. If a child leaves the area to play somewhere else, keep the child in camera range.

### **Warm Up**

With a new child (first test setting), spend a few minutes in the child's classroom or childcare room. Join in the child's play with the familiar caregiver to help the child become comfortable with you. Be positive and enthusiastic with the child.

After the child is comfortable with you, let the child know via the familiar adult or yourself that you have interesting toys and games to play with the child. Describe to the child what you do with her as you are doing it (e.g., "We are going to see the toys"). The familiar adult can come with you to the testing room if necessary to comfort the child.

### **Administration (Play) Instructions**

The adult should play with the child in a way that encourages interaction with the toys, and the adult. If a child becomes distressed, testing should be terminated. The following directions can be used when the adult play partner is not familiar with all portions of the EPSI assessment (this play partner can be a caregiver, teacher, or parent).

**Directions to adult play partner:** "We are interested in how (child's name) solves problems while playing with toys. Use these toys to play with (child's name) as you usually would. Each toy will be used for 2 minutes; the session will last for a total of 6 minutes." Each toy is presented separately for 2 minutes each, and involves some specific instructions. Specific Directions for use of each toy:

<i>Form A Toy Set</i>	<i>Form B Toy Set</i>
<p><b>A1. Pop-Up (Dinosaurs)</b></p> <ol style="list-style-type: none"> <li>a. Place pop up toy in front of child and draw child attention to the toy.</li> <li>b. Say, "Let's see if you can make all of these pop up."</li> <li>c. Wait 10 seconds for the child to engage with the toy.                             <ul style="list-style-type: none"> <li>• If the child is engaged, let the child continue to play.</li> <li>• If the child is <b>not</b> engaged, say "Can you push a button?" or "Can you push the top down?"</li> </ul> </li> <li>d. Repeat as necessary for the remainder of the two minutes.</li> <li>e. At end of 2 minutes, say, "Bye-bye dinosaurs." Remove toy.</li> </ol>	<p><b>B1. Pop-Up (Pals or Pets)</b></p> <ol style="list-style-type: none"> <li>a. Place pop up toy in front of child and draw child attention to the toy.</li> <li>b. Say, "Let's see if you can make all of these pop up."</li> <li>c. Wait 10 seconds for the child to engage with the toy.                             <ul style="list-style-type: none"> <li>• If the child is engaged, let the child continue to play.</li> <li>• If the child is <b>not</b> engaged, say "Can you push a button?" or "Can you push the top down?"</li> </ul> </li> <li>d. Repeat as necessary for the remainder of the two minutes.</li> <li>e. At end of 2 minutes, say, "Bye-bye pals/pets." Remove toy.</li> </ol>
<p><b>A2. Stacking Cups (Round)</b></p> <ol style="list-style-type: none"> <li>a. "Un-nest" cups <i>out of the child's view</i> prior to starting the assessment</li> <li>b. Place stacking cups in front of child and draw child's attention to the toy.</li> <li>c. Say, "These all fit together. Can you make them fit?"</li> <li>d. Wait 10 seconds for the child to engage with the stacking cups.                             <ul style="list-style-type: none"> <li>• If the child is engaged, let the child continue to play.</li> <li>• If the child is <b>not</b> engaged, say "Can you make them fit?"</li> </ul> </li> <li>e. Repeat as necessary for the remainder of the two minutes.</li> <li>f. At end of 2 minutes, say, "Bye-bye cups." Remove toy.</li> </ol>	<p><b>B2. Stacking Cups (Square)</b></p> <ol style="list-style-type: none"> <li>a. "Un-nest" cups <i>out of the child's view</i> prior to starting the assessment</li> <li>b. Place stacking cups in front of child and draw child's attention to the toy.</li> <li>c. Say, "These all fit together. Can you make them fit?"</li> <li>d. Wait 10 seconds for the child to engage with the stacking cups.                             <ul style="list-style-type: none"> <li>• If the child is engaged, let the child continue to play.</li> <li>• If the child is <b>not</b> engaged, say "Can you make them fit?"</li> </ul> </li> <li>e. Repeat as necessary for the remainder of the two minutes.</li> <li>f. At end of 2 minutes, say, "Bye-bye cups." Remove toy.</li> </ol>

<i>Form A Toy Set</i>	<i>Form B Toy Set</i>
<p><b>A3. Ball Machine</b></p> <ol style="list-style-type: none"> <li>Place ball machine in front of child, with at least five balls next to the machine (not inside) and draw child's attention to the toy.</li> <li>Say, "Where do the balls go? How do they come out?"</li> <li>Wait 10 seconds for the child to engage with the ball machine. <ul style="list-style-type: none"> <li>If the child is engaged, let the child continue to play.</li> <li>If the child is <b>not</b> engaged, say "Where do the balls go?" or "How do they come out?"</li> </ul> </li> <li>Repeat as necessary for the remainder of the two minutes.</li> <li>At end of 2 minutes, say, "Bye-bye balls." Remove toy.</li> </ol>	<p><b>B3. Pound-a-Ball</b></p> <ol style="list-style-type: none"> <li>Place pound-a-ball in front of child, with at least four balls next to the machine (not inside) and draw child's attention to the toy.</li> <li>Say, "Where do the balls go? How do they go into the holes?"</li> <li>Wait 10 seconds for the child to engage with the pound-a-ball. <ul style="list-style-type: none"> <li>If the child is engaged, let the child continue to play.</li> <li>If the child is <b>not</b> engaged, say "Where do the balls go?" or "How do they go into the holes?"</li> </ul> </li> <li>Repeat as necessary for the remainder of the two minutes.</li> <li>At end of 2 minutes, say, "Bye-bye balls." Remove toy.</li> </ol>

Toys were screened and selected based on the fact that each has a final endpoint with steps involved in reaching the endpoint. Additionally, toys were selected with the ability to engage children's interest and evoke play. Other important criteria for selecting these toys included safety, common availability in child care settings, and suitability for use by children in the age range (birth to 4 years). Additionally, we rejected any toys that met these criteria, but too often evoked gross movement rather than sitting and exploring.

Pop-up toys, Gumball Machine, Pound-a-Ball, and Stacking Cups (Round or Square) are used in each administration as the "standard" play toys recommended for use in the EPSI. These and/or similar toys were used for the normative sample. The toys above represent examples of the toys recommended for each toy set. Although similar toys may be used, ensure that any variant has the following characteristics:

- Stacking cups should be round or square.
- Pop-up toys should have four pop-ups: one with a push button, one with a slide lever, one with a "rocking" lever, and one with a twist lever.
- The gumball machine should have four balls that go into the top of the toy and require a lever or button press to release the ball(s). **Remove the batteries or turn the sound switch to the OFF position.**
- The Pound-a-Ball should have at least 4 balls, and the balls should be easily accessible to the child after they've been 'pounded' into the hole (e.g., they roll or fall into a place where the child can quickly grab them).
- All toys should be labeled as appropriate for children 6-12 months and older**

During times when the specific directions are not needed for the EPSI, the following hints for playing with the child may be helpful:

- Follow the child's lead (play with the materials that interest the child). Encourage new play with toys if the child does not become engaged with the toys, or becomes disinterested in the toys.
- Comment about what the child is doing, or describe what you are doing.

### **Winding Down the Play Assessment**

Tell adult that the time has elapsed. The adult can begin assisting the children to end their play with the toys. Thank the child (and adult) for playing today. If the child becomes upset having to leave the toys, mention that he/she will be able to play with the toys another day, but now he/she is going to go back to his/her classroom to play with friends.

### **Clean Toys**

You will need to clean the toys in order to use them with other children, so wipe down all toys after each session using antiseptic moist disposable towelettes according to the towelette directions. If there is more time between assessment sessions, you can clean the toys using bleach/water solution (1 tablespoon bleach to 1 quart of cool water) – let soak for 2 minutes, and left to air dry. Toys that are cleaned using antiseptic wipes should be cleaned using a bleach solution regularly.

### **Modifications for Children with Sensory Impairments**

Some modifications may need to be made for children with physical limitations, visual impairments, or hearing impairments. The suggestions listed here are general, and should not be considered the only modifications that can be made to the format. The important component is to arrange the toys to encourage child engagement and problem solving that occurs in a play format.

For children with physical limitations, you may want to modify how the toys are placed before the child. The toys can be moved closer or the child positioned on the floor in a way that allows best access to the pieces.

For children with visual impairments, you may want to orient the child to the toys each session, or provide several weeks of introduction to the different toys and then start assessments. You may also want to introduce the child to each of the toy pieces (allow him/her to touch each one), and then show the child the different parts of the play set (e.g., each stacking cup or balls for the ball machine). Tell the child where you have placed each of the toys for him/her to pick up or touch, and be more active in bringing toys within the child's

reach. Set up play materials in a consistent arrangement to encourage safe engagement.

For children with hearing impairments, you may want to position yourself to allow each of you to see each other easily for using sign language or lip reading to communicate. If the child uses a hearing aid or audio trainer, position yourself so the child can best hear what you are saying.

No matter what modifications are made, the focus of the assessment should remain on encouraging the child to play with the toys and adult play partner.

*Use of this Manual requires permission of the developers. Please contact: Drs. Dale Walker ([Walkerd@ku.edu](mailto:Walkerd@ku.edu)) or Jay Buzhardt ([jaybuz@ku.edu](mailto:jaybuz@ku.edu)) or voice: 913.321.3143.*