

Measuring Environmental Knowledge and Connection to Nature; A Games

Testing Tool for Preschoolers (3-5-year-olds)

Overarching Recommendations

1. If possible, bring an assistant to help with recording the results;
2. It is advised that each session be audio-recorded upon consent from the parent(s)/guardian(s) of each participant;
3. Enlarge the suggested tables to poster size to establish a game board;
4. Enlarge the loose pictures to an appropriate size to use as game pieces;
5. Play one game at a time to allow for clarity for the participants;
6. Shuffle the loose cards in between participants for games 1A and 2A;
7. Finally, have a dance party, tell some knock-knock jokes, and/or have a puppet on hand to facilitate breaks in between games if the participant is losing interest or at the end of the session for some additional fun (not necessary if the participant is engaged).

Before Starting the Games Testing

The opening exercise will have the child draw a picture of themselves on a blank square piece of paper (this piece of paper should be the same size as the cut outs for game 1A). This is a great ice breaker, and the picture will be used later in game 2B.

- Begin by explaining the task to the child:
 - o Example: “Before we start, I would like you to draw a picture of yourself on this piece of paper”.
- Set this picture aside, so it can be used later in game 2B.

It is essential to go over the concepts of dirty water (water pollution), dirty/smoky air (air pollution), and dirty ground (ground pollution) briefly without iterating the environmental issues and consequences associated with each one. This will allow the children to have some understanding, without creating bias in the answers received from each participant. Examples are as follows:

- Example of explanation: “Before starting the games, I am going to go over some ideas that you will see today”;
- Example for dirty water: “Dirty water can happen when trash and chemicals get in the water”;
- Example for dirty/smoky air: “Dirty or smoky air can happen when too many harmful gases and smoke are in the air”;
- Example for dirty ground: “Dirty ground can happen when garbage gets into the environment”.

These phrases can be referred to upon conducting the games that involve these challenging concepts (Game 1B and Game 2B). Thus, giving the child some understanding without saying it in a way that will influence their responses.

Section 1: Environmental Sensitivity




Game 1A






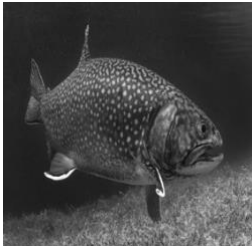
Recommendations:

It is advised that the researcher enlarges, prints, and laminates the pictures found in the table below. Additionally, it is advised that the researcher bring two separate containers to make yes and no bins, to facilitate sorting (may be beneficial to use a green coloured checkmark and a red coloured 'x' alongside the "yes" and "no" signs, as some children respond best to visual cues). Finally, another option to keep the child engaged is to place the bins on opposite sides of the testing area, allowing the game to have a task and movement. If this is the case, then it is advised that the researcher explains the bins to each participant before beginning the game.

Instructions:

1. Begin by explaining the exercise to the child:
 - a. Example: "In this first game, I will hand you a picture and ask if the thing in the picture can feel an owie or get hurt, and then you will sort them into the yes or no bins (demonstrate while explaining)";
2. Show the child one picture after the other from the table below (laminated cut-out versions of the pictures). For every picture, ask they/them:
 - a. Example: "Can (ex. a tree) go owie? Can (this picture) get hurt?";
3. For each picture, ask the child to sort their answer either in the yes bin or the no bin, allowing the child to partake in a sorting exercise;
4. Therefore, the game result will be a simple list of "yes" and "no" matching each picture in the table below;
5. Record the results on the scoresheet as "yes" or "no";
6. Note: It is important to shuffle the loose cards in between participants.

Tree	Chicken	Bike
		

<p style="text-align: center;">Bird</p> 	<p style="text-align: center;">Reindeer</p> 	<p style="text-align: center;">Airplane</p> 
<p style="text-align: center;">Cut Down Tree</p> 	<p style="text-align: center;">Car</p> 	<p style="text-align: center;">Fish</p> 

Game 1B

Recommendations:

It is advised that the researcher prints and laminates an enlarged version of the table. Additionally, it is recommended that nine of each of the happy and sad smiley faces are enlarged, printed, and laminated so the children can place them on top of the pictures.

Instructions:

1. Begin by explaining the exercise to the child:
 - a. Example: “We are going to play a game of happy and sad faces, and I would like you to put a happy smile or sad face on each photo you see here (demonstrate while explaining)”;
2. Then for each picture, have a smiley and sad face in your hands providing the child with the option to pick and place one or the other on top of each picture (there will be a total of 18 happy and sad face cut outs);
3. Ask the child to place a happy or sad face image on top of each of the pictures in the table below one after the other (you could use your finger to point to each picture);
 - a. Example: “We’ll start with dirty water, which smiley would you like to place there (the researcher should have both a happy and sad face in their hand)?”
 - b. The researcher must ensure that they do NOT ask any questions to the child and do NOT explain what the picture means;
4. Record results on the scoresheet as “happy” or “sad” smile.

“Happy smile” and “sad smile”



<p>Dirty Water</p>	<p>Dirty or Smoky Air</p>	<p>Watering Plants</p>
<p>Dirty Ground</p>	<p>Cleaning up</p>	<p>Cutting Down Trees</p>
<p>Dirty or Smoky Air</p>	<p>Planting a Tree</p>	<p>Plastic on the Ground</p>

Section 2: Environmental Awareness

Game 2A










Recommendations:










It is advised that the researcher enlarges, prints, laminates, and cut out *List 1* found below (cut outs similar to Game 1A). Then, similar to the previous game (1B), enlarge, print, and laminate the pictures in *List 2*. This exercise is a matching game.

Instructions:

1. Place the table with the pictures from *List 2* in front of the child and pile the pictures from *List 1*. Then begin by explaining the exercise:
 - a. Example: “In this game, I am asking you to match a picture from *List 1* with a picture from *List 2* (demonstrate while explaining)”;

2. Show the child one picture at a time from *List 1* and ask they/them to find a picture among the ones already placed in front of they/them (*List 2*) and ask they/them to answer:
 - a. “What do you need to have (this picture)?”, then ask “why did you match those two pictures?”;
 - b. Example: “What do you need to make a picnic table?”, and then ask, “why did you match those two pictures?”;
3. What the picture represents must be clearly stated to make the child understand:
 - a. Example: the image is a “WOODEN table” or that the image represents “BLUEBERRIES” and not every kind of berry;
4. Continue this process for every image in *List 1*;
5. Record which item from *List 1* was paired with in *List 2*. To the question “Why?” the child does not have to select any picture, but reply in words, this implies that researchers must synthesize it and write down children’s answers in the scoresheet;
6. Note: It is important to shuffle the loose cards in between participants.

<u>List 1</u>		
Picnic Table 	Eggs 	Tuna can 
Carrots 	Glass of milk 	Tap water 
Wool hat 	Paper 	Blueberries 

<u>List 2</u>		
Wood 	Fish 	Cow 
Chicken 	Garden 	Money 
River 	Truck 	Sheep 

Game 2B

Recommendations:

It is advised that the researcher enlarges, prints, and laminates the pictures found in the table below, *List 1* (cut outs similar to Game 1A). Comparable to the previous Game 1B, it is recommended that the researcher organizes the pictures from *List 2* into a table, as well as to enlarge, print, and laminate the table. *The picture that the child drew of themselves at the beginning of the testing should be placed under the “you” category in *List 2* along with three other cards that have the word “YOU” written on them.

Additionally, bring enlarged, printed, and laminated versions of each individual (3 of each) picture in *List 2*. Finally, utilize the bins from Game 1A to facilitate the sorting of the “yes” and “no” segment (may be beneficial to use a checkmark and an ‘x’ alongside the “yes” and “no” signs, as some children respond best to visual cues).

Instructions:

1. Begin by explaining the exercise to the child:
 - a. Example: “In this game, I will first ask you to explain what you see, and then I will ask you if the picture I show you (from *List 1*) can hurt each of the pictures in *List 2* by getting you to sort them into the yes or no bins again (demonstrate while explaining)”;





Part 1:

2. Show the child one picture from *List 1* (representing different kinds of pollution) and place it visibly in front of they/them. The picture should NOT be explained again at this time;
3. Ask the child what the environmental issue (from *List 1*) means and record their answer:
 - a. Example: “What is air pollution/dirty air?”;
4. For this question the child does not have to select any picture, but reply in words, this implies that researchers must synthesize it and write down children’s answers in the scoresheet.
5. After the first step is complete, place the pictures (*List 1*) and table (*List 2*) in front of the child;

Part 2:

6. Then show the child by pointing, one after another, at the images in *List 2* and ask they/them for every set of pictures the following and record their answer:
 - a. “Can (the first picture) hurt (the second picture)/make (the second picture) go owie?”;
 - b. Example: “Can (ex. dirty or smoky air) hurt (ex. an animal)/make (ex. an animal) go owie?”;
 - c. If the child says “yes”, encourage them to place it in the “yes” bin and vice versa;
 - d. Then move onto the next photo from *List 1* and go through each item in *List 2*:
7. The game will result in a simple list of “yes” and “no” for each picture in *List 1* corresponding to each set of pictures in *List 2*. Record the results on the scoresheet.

<u>List 1</u>			
Dirty or Smoky Air	Dirty Ground	Dirty Water	Cutting Down Trees
			

<u>List 2</u>				
You	Animal	Car	People	Forest
				

Section 3: Environmental Preferences







Game 3A

Recommendations:

It is advised that the researcher prints and laminates an enlarged version of the table. It is important to note that the participants are allowed to pick as many options as they would like for each question provided below.

Instructions:

1. Begin by explaining the exercise and saying what each of the pictures in the table are:
 - a. Example: “I am going to show a table of pictures and ask you some questions that will require you to pick a photo (demonstrate while explaining)”;
 - b. Then go through the table and say what each picture is:
 - i. Example: “This is a picture of children playing in a backyard, this is a picture of a playground, etc.”;
 - c. Example: “Then I will ask you questions, such as where do you usually play the most? And I would like you to pick a picture from this table.”
2. Place the table of pictures in front of the child and ask they/them to select from the pictures to answer the following questions:
 - a. Question 1: “Where do you play the most?” and “Why?”
 - b. Question 2: “Where do you like to play the most?” and “Why?”
 - c. Question 3: “Where do you feel the most safe to play?” and “Why?”
3. First record where they play on the scoresheet. To the question “Why?” the child does not have to select any picture, but reply in words, this implies that researchers must synthesize it and write down children’s answers in the scoresheet.

<p style="text-align: center;">Backyard</p> 	<p style="text-align: center;">Playground</p> 	<p style="text-align: center;">Farm</p> 
<p style="text-align: center;">Inside</p> 	<p style="text-align: center;">Street</p> 	<p style="text-align: center;">Forest</p> 

Game 3B

Recommendations:

It is advised that the researcher uses the same table of pictures from Game 3A. It is important to note that the participants are allowed to pick as many options as they would like for each question provided below.

Instructions:

1. Begin by explaining the exercise to the child:
 - a. Example: “This game will be similar to the last one (Game 3A), where I will ask you questions, and you will point to a photo in the table (demonstrate while explaining)”;
2. Place the table of pictures in front of the child (from Game 3A) and ask they/them to select from the pictures to answer the following questions:
 - a. Question 1: “Where DO you NOT like to play?” and “Why?”
 - b. Question 2: “Where DO you NOT like to play the most?” and “Why?”
 - c. Question 3: “Where DO you NOT feel safe to play?” and “Why?”
3. First record where they play on the scoresheet. To the question “Why?” the child does not have to select any picture, but reply in words, this implies that researchers must synthesize it and write down children’s answers in the scoresheet.

Debrief

After completing the games testing with the participant, it is recommended that the researcher debriefs the child by explaining pollution in simple terms. It may be beneficial to bring materials along with you, such as a jar showing clean water and a jar showing dirty water.

- Go over dirty water (water pollution), dirty ground (ground/soil pollution), and dirty or smoky air (air pollution);
 - Example: “Today we have been talking about different kinds of pollution. I will now go over these ideas with you. If you have any questions, please ask”;
 - Example of water pollution: Water pollution can happen when waste and chemicals are found in a body of water (e.g., the ocean or river). The waste and chemicals can make the water not safe for fish and other animals to live in;
 - Example of ground pollution: Ground pollution can happen when garbage is found in the environment (e.g., on the side of the road or on the ground). When garbage gets into the environment it can cause health problems for animals and humans;
 - Example of air pollution: Air pollution can happen when too many chemicals and harmful gases are in the air. This can cause the air to become smoggy or have a smoky look to it and can cause health problems for animals and humans (e.g., makes it hard to breathe).
 - Example of cutting down trees: Deforestation can happen when humans take too many trees from the forest. This can have a negative impact on the wildlife and ecosystems in the forest.
- Finally, ensure to ask the participant again if they have any questions.