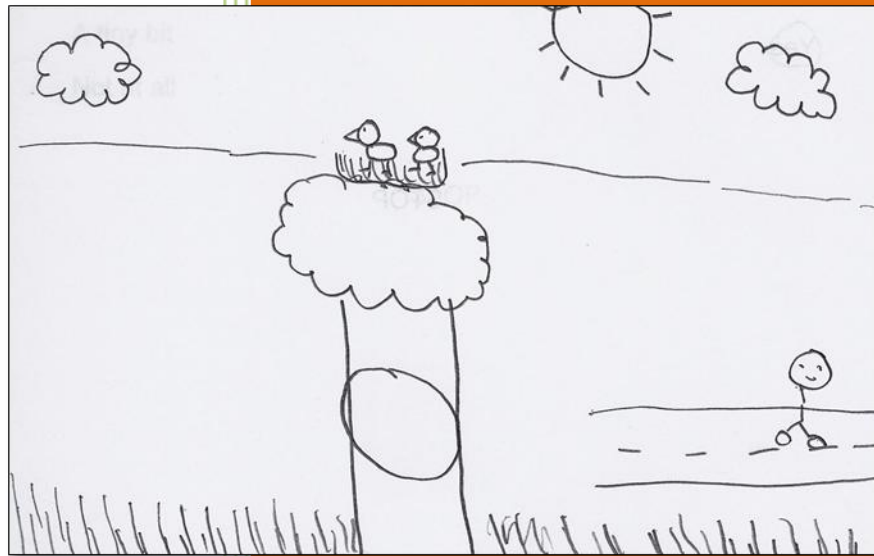


2010

Young Kids and Environmental Sustainability: A Needs Assessment



Prepared by:

Concord Evaluation Group, LLC,

Prepared for:

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About the Study

In 2010, WGBH Boston (www.wgbh.org) was awarded a grant from the National Science Foundation (NSF) to explore the development of a new animated television series for children about environmental sustainability. In preparation for the series development, NSF requested that WGBH perform a needs assessment to determine how much kids know and understand about topics related to environmental sustainability.

There is a dearth of available data that explores the extent to which young children comprehend issues related to the environment and sustainability. This needs assessment document begins to fill the void of research in this area. WGBH hired independent evaluator Concord Evaluation Group, LLC (CEG) to perform the needs assessment. CEG held seven focus groups during August and September 2010. The focus groups took place at WGBH in Boston, MA.¹ Each focus group was comprised of a mix of girls and boys aged 6 - 9 years old. We recruited 60 children from the greater Boston area to participate in the groups, but due to no-shows and cancellations, a total of 48 children participated.

The goal of the focus groups was to gather data on kids' knowledge and attitudes about the environment and sustainability. Specifically, we assessed the following:

Knowledge

- The extent to which kids understand that they are part of their environment and that people are part of ecosystems
 - The extent to which kids understand that something they do today can have a subsequent environmental impact in the future
 - The extent to which kids comprehend the reasons behind recycling
 - The extent to which kids know about water systems (i.e., where water comes from and where it goes)
- The extent to which kids comprehend that some things are renewable and others are not
 - The extent to which kids comprehend that some things (like water, air) don't grow back—that these resources can be degraded/polluted
- The extent to which kids know that all species have to share resources and that some resources are finite
- The extent to which kids comprehend that there are factors that can influence the environment, even if they cannot be seen

¹ A national sample was not possible for this study due to budgetary constraints (this was a small pilot grant).

Attitudes

- The extent to which kids care about their environment

Behaviors

- The extent to which kids practice “green” habits
- The extent to which kids spend time in nature

Throughout the focus group sessions, we asked kids to respond to specific questions by themselves on student forms (see Appendix). Then, we discussed the questions and responses with the group. This approach enabled us to gather individual-level student data that was not influenced by the groups’ opinions and then to “dive deeper” into student responses with group discussions.

Each of the focus groups began with a discussion designed to collect data on what kids think of when they hear the word “environment.” Next, we led a discussion designed to learn whether kids perceived themselves to be a part of the environment. Then, we asked kids to share with us their attitudes about the environment. Next, we asked kids to tell us whether they recycle and to explain to us why they thought they recycled. The next topic we discussed with kids was about the water cycle and their understanding of it. The final topic we covered was the issue of interdependency of species.

The focus group discussions lasted 45 -75 minutes each, with breaks, as needed. Parents provided written documentation of informed consent for their children to participate in the study. CEG provided each child \$30 for his or her participation.

Two analysts independently coded and classified the open-ended response data to look for themes and trends. These findings are reported below.

Study Participants

We recruited a diverse sample of children to participate in the focus groups that was reflective of the demographic stratification nationwide. Table 1 summarizes the participant characteristics.

**Table 1:
Participants' Demographic and Background Characteristics**

Characteristic	Total Frequency & Percentage (N = 48)	Compared to US Demographics ^[1]
Gender		
Male	22 (46%)	50%
Female	26 (54%)	50%
Age		
Six years old	9 (19%)	N/A
Seven years old	11 (23%)	N/A
Eight years old	16 (33%)	N/A
Nine years old	12 (25%)	N/A
Race / ethnicity ^[2]		
White	42 (88%)	80%
Black or African-American	8 (17%)	13%
Hispanic, Latino or Spanish	7 (15%)	15%
Asian / Indian	4 (8%)	4%
American Indian or Alaskan Native	1 (2%)	1%
Native Hawaiian or Other Pacific Islander	1 (2%)	<1%

Characteristic	Total Frequency & Percentage (N = 48)	Compared to US Demographics ^[1]
Urbanicity (Reported by parents)		
Urban	15 (31%)	79%
Suburban	31 (65%)	Not defined
Rural	0 (0%)	21%
Missing Data	2 (4%)	--
Parent educational levels (Proxy for socioeconomic status)		
Less than four-year college degree	13 (27%)	72%
Four-year college degree or more	33 (69%)	28%
Missing data	2 (4%)	--

^[1] US demographic data obtained from the US Census Bureau (<http://www.fhwa.dot.gov/planning/census/cps2k.htm> and http://factfinder.census.gov/servlet/ADPTable?_bm=y&-geo_id=01000US&-ds_name=ACS_2009_1YR_G00_&-lang=en&-caller=geoselect&-format=) and the CIA World Factbook (<https://www.cia.gov/library/publications/the-world-factbook/geos/us.html>).

^[2] Frequencies for race and ethnicity reflect that some parents classified their kids into more than one category. Therefore the frequency does not add to 48 and the percentages will not total 100%.

Study Findings

Most kids defined the “environment” by drawing places or things that were familiar to them. Many kids equated the environment with recycling.

As one of our first tasks, we asked kids to draw a picture of the “environment.” We did not define the word for them. Instead, we asked them to use whatever definition came to mind and to represent their definitions in drawings. In their drawings, kids defined environment in many different ways. Most kids drew pictures of places and things that were familiar to them, like the trees and plants in their neighborhood, a park or playground. We observed that, for the most part, kids did not view the environment as a place that was far away. In fact, only one child drew a picture of a rainforest. Figure 1 shows exemplars of the drawings the kids shared with us.

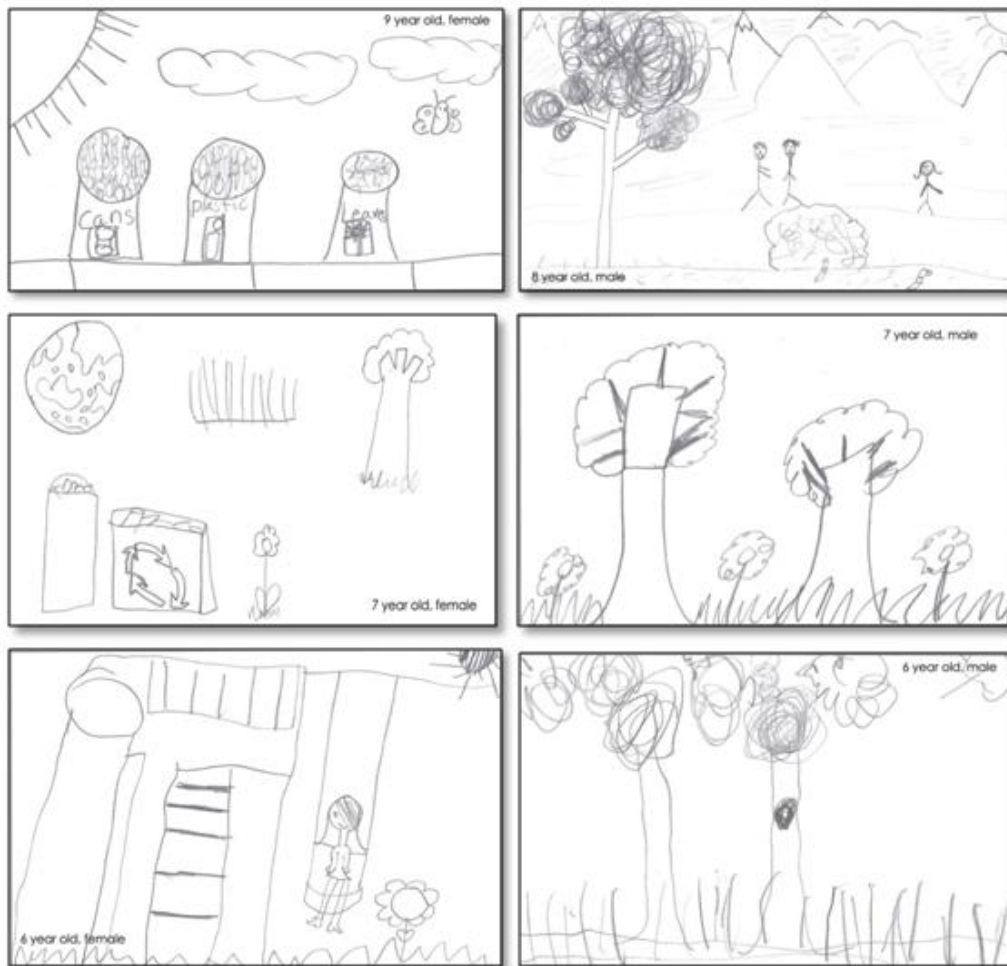


Figure 1: Sample drawings of kids' perceptions of the environment.

We reviewed the kids’ drawings and classified each one based on the main themes contained within. Table 2 summarizes the themes that kids used to define what the environment meant to them. More than half (60%) of the drawings included some form of plant life—either trees, flowers or bushes—and clouds or sun. Drawings of the terrain (e.g., grass, hills, mountains and rocks) were also very common (56% contained these items). Nearly one-third of the drawings included animals, birds, or insects. Twenty-one percent of the drawings included people.

Almost 17% of the kids included a recycling theme in their drawings, even though we had not even discussed the topic of recycling. During the group discussions, kids explained that they had been learning about the environment in the context of discussions about recycling. These kids had learned about recycling through television shows, in school and at home.

**Table 2:
Kids’ Perceptions of the Environment**

Themes	# of Kids and Percentage (N=48)
Plants or trees	29 (60%)
Sky (Cloud or sun)	29 (60%)
Terrain (Grass, hills, mountains, rocks)	27 (56%)
Animals, birds, or insects	14 (29%)
People	10 (21%)
Man-made objects (Houses, buildings, sidewalks, benches or swingsets)	9 (19%)
Recycling (Recycle symbol or recycling containers)	8 (17%)
Missing	4 (8%)
Water	3 (6%)
Planet Earth	3 (6%)
Rainforest	1 (2%)

Note: Frequencies reflect that some participants included more than one of the categories listed in their drawings. Therefore the frequency does not add to 48 and the percentages will not total 100%.

Most kids believed that they were part of the environment, but almost half could not explain why. Again, the topic of the “environment” elicited kids’ thoughts about recycling.

We asked the kids if they thought that they were part of the environment. The majority of kids (n = 40, 83%) said that they thought they were part of the environment. Nearly half of those kids (n = 19, 48%), however, could not explain why they thought they were part of the environment (or how they knew they were part of the environment) or indicated that they simply guessed at the answer.

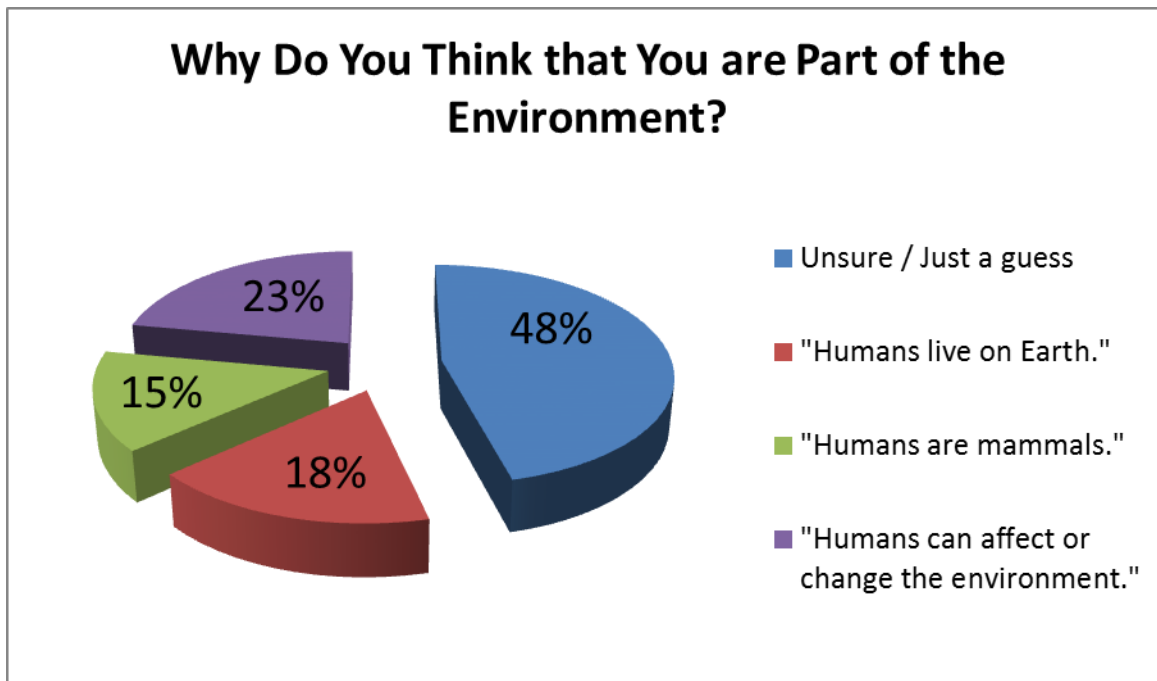


Figure 2. Evidence kids provided that they are part of the environment.

Seven of the kids said they were part of the environment simply because humans live on Earth and are part of the world. For example, some kids said:

“...because we were made along with the Earth.” – 6 year old, male

“...because we are a part of the world and nature.” – 7 year old, female

“...because we live in the environment.” – 8 year old, female

“...because we are part of life.” – 8 year old, male

“...because the environment is grass and trees and we live on it.” – 8 year old, female

Six kids were more specific and explained that they were part of the environment because humans are mammals. For example:

“...because we are animals.” – 6 year old, female

“...because I am a mammal.” – 9 year old, female

“...because I am a mammal and I am part of the world.” – 9 year old, male

“If you consider birds to be a part of the environment, I think we are (part of the environment) because we are animals just like birds.” – 9 year old, male

Nine kids (all 8 and 9 year olds) offered a more sophisticated explanation than the other kids. They explained that they knew they were part of the environment based on the logic that because humans can affect or change the environment they must then, in fact, be a part of it.

“I think we are all part of the environment because we are affecting it a lot more.” – 8 year old, male

“...because I help clean up and recycle.” – 9 year old, female

“...because we recycle and care about the environment and don't want to destroy it.” – 9 year old, female

“We are involved. Some people are trying to save it by recycling.” – 9 year old, female

“People clean stuff, re-use and recycle.” – 9 year old, female

Note, however, that these answers mostly include references to recycling. This was the second time that the topic of the “environment” elicited kids’ thoughts about recycling, before we had raised the issue.

Five kids (10%) said that they did not think that they were part of the environment. Most of these kids (n = 4) were six and seven year-olds. Three other kids (6%) were unsure about whether they were part of the environment. One of these three kids, a nine year-old girl, used the same logic that other kids used to explain why they *were* part of the environment as evidence that perhaps humans are *not* part of it (although the logic here could be viewed as faulty). She said:

“We sometimes help the environment but not that much. We tend to destroy the environment... and have been using coal and fossil fuels and we're running out.” – 9 year old female

Table 3 summarizes the breakdown of the kids’ answers by demographic and background characteristics. None of these differences between the genders or across demographic groups was statistically significant.

Table 3:
Are you a part of the environment?

Characteristic	Yes (N=40)	No (N=5)	Unsure (N=3)
Gender			
Male	18 (45%)	4 (80%)	0 (0%)
Female	22 (55%)	1 (20%)	3 (100%)
Age			
Six years old	7 (18%)	2 (40%)	0 (0%)
Seven years old	9 (22%)	2 (40%)	0 (0%)
Eight years old	14 (35%)	1 (20%)	1 (33%)
Nine years old	10 (25%)	0 (0%)	2 (67%)
Race / ethnicity			
White	33 (83%)	4 (80%)	1 (33%)
Black or African-American	6 (15%)	1 (20%)	0 (0%)
Hispanic, Latino or Spanish	6 (15%)	0 (0%)	1 (33%)
Asian / Indian	4 (10%)	0 (0%)	0 (0%)
American Indian or Alaskan Native	1 (3%)	0 (0%)	0 (0%)
Native Hawaiian or Other Pacific Islander	1 (3%)	0 (0%)	0 (0%)

Note: Frequencies for race and ethnicity reflect that some parents classified their kids into more than one category. Therefore the frequency does not add to 48 and the percentages will not total 100%.

Kids reported that they cared about the environment and enjoyed outdoor activities, but their favorite activities rarely involved interacting with nature.

All of the kids reported that they cared about the environment. Most of the kids (n = 35, 73%) said that they cared “a lot” about the environment, 25% (n = 12) reported that they cared “a little” about the environment, and only one child reported that they cared “only a tiny bit.”

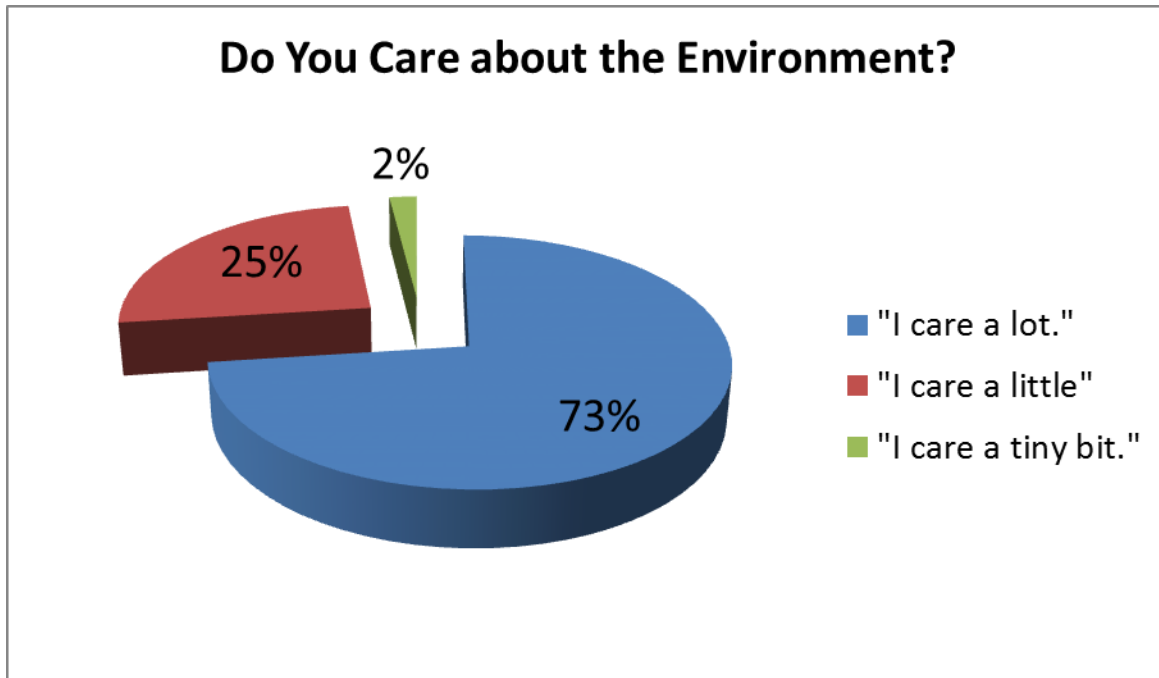


Figure 3. How much kids reported caring about the environment.

Table 4 summarizes the student responses according to gender, age, and ethnicity. None of the differences between genders or across different age or ethnic groups was statistically significant.

Table 4:
Do you care about the environment?

Characteristic	A lot (N=35)	A little (N=12)	A tiny bit (N=1)	Not at all (N=0)
Total (N=48)	35 (73%)	12 (25%)	1 (2%)	0 (0%)
Gender				
Male	15 (43%)	6 (50%)	1 (100%)	0 (0%)
Female	20 (57%)	6 (50%)	0 (0%)	0 (0%)
Age				
Six years old	5 (14%)	3 (25%)	1 (100%)	0 (0%)
Seven years old	8 (23%)	3 (25%)	0 (0%)	0 (0%)
Eight years old	12 (34%)	4 (33%)	0 (0%)	0 (0%)
Nine years old	10 (29%)	2 (17%)	0 (0%)	0 (0%)
Race / ethnicity				
White	31 (89%)	10 (83%)	1 (100%)	0 (0%)
Black or African-American	6 (17%)	2 (17%)	0 (0%)	0 (0%)
Hispanic, Latino or Spanish	7 (20%)	0 (0%)	0 (0%)	0 (0%)
Asian / Indian	3 (9%)	1 (8%)	0 (0%)	0 (0%)
American Indian or Alaskan Native	1 (3%)	0 (0%)	0 (0%)	0 (0%)
Native Hawaiian or Other Pacific Islander	1 (3%)	0 (0%)	0 (0%)	0 (0%)

Note: Frequencies for race and ethnicity reflect that some parents classified their kids into more than one category. Therefore the frequency does not add to 48 and the percentages will not total 100%.

Almost all of the kids (n = 46, 96%) reported that they liked to play outside. Most kids reported that they enjoyed using equipment or playing sports outside, including riding bikes and scooters, playing sports, playing on playgrounds, jumping rope and hula hooping, or jumping on a trampoline (67%). A very small proportion of kids indicated that they liked to engage in activities that involved nature, such as climbing trees (7%). Some kids reported that they liked to

play with family or pets outside, without being specific about the types of activities they liked to do (6%). Seven percent of kids reported that they weren't sure what they liked to do outside. Table 5 lists some of the kids' favorite activities.

Table 5:
What is your favorite thing to play outside?²

Favorite outside activity	# of Kids and Percentage (N=46)
Riding bikes or scooters	11 (24%)
Sports	9 (19%)
Playground	7 (15%)
Swimming in pools or lakes	4 (9%)
Climbing trees	3 (7%)
Jump roping / Hula hooping	3 (7%)
Playing with friends and family	2 (4%)
Building contraptions	1 (2%)
Trampoline	1 (2%)
Imagination games	1 (2%)
Playing with pets	1 (2%)
Not sure	3 (7%)

² We only asked kids to list one favorite activity. Kids may have enjoyed other activities, including those that required interactions with nature, but they did not have to report them.

Most kids reported they recycled, but younger kids found it more difficult than older kids to explain why.

To assess kids’ familiarity with the concept of recycling, we asked the kids what they typically do with things that they don’t need any more. (We deliberately did *not* mention the word recycling in our question so we could see whether kids would suggest it on their own). Over half of the kids (n = 27, 56%) said they would recycle unneeded items, find another use for them, or give them away to someone else. A large proportion of kids (17%) were unsure what they would do with things they no longer needed (probably due to the vague nature of our question—we purposefully did not specify an actual object, but just asked them what they might do with any given item that was no longer needed). An almost equivalent proportion (15%) reported that they would simply throw the unneeded item away. A summary of their responses are shown in Table 6.

Table 6:
What do you do with things you don't need any more?

Answers	# of Kids and Percentage (N=48)
Recycle or reuse it	19 (39%)
Charity or give it to someone else	8 (17%)
Not sure	8 (17%)
Throw it away	7 (15%)
Sell it	3 (6%)
Don't throw it on the ground	2 (4%)
Put it in the basement	1 (2%)

Thirteen kids (27%) reported that things one throws away eventually end up in the dump or a landfill. Two kids reported that trash will eventually dissolve over time and become dirt:

“...stays around for a long time and then dissolves into dirt.” – 8 year old, male

“It gets made into compost.” – 9 year old, female

Two other kids reported that trash eventually gets re-used by other people:

“People go and re-use the trash” – 9 year old, male

“People re-use it.” – 8 year old, female

We asked kids if they typically recycled items at home or at school. All but one (98%) responded that they did recycle. One child who reported that he did not recycle explained that his family did not own a recycling bin. He was also one of the kids who reported that he could not play outside (because he lived in an apartment).

Fifty six percent of the kids reported that they recycled in order to help the environment or reused objects so that they wasted less. However, 38% of the kids could not explain why they, personally, recycled (Table 7).

Table 7:
Why do you recycle?

Characteristic	# of Kids and Percentages (N=47)
No answer	18 (38%)
Help environment	14 (30%)
Re-use / Less waste	13 (28%)
Money for family (bottle deposits)	2 (4%)

We observed a relationship between kids’ ages and their ability to explain why they recycled. Younger kids were less likely to be able to explain why they recycled than older kids (Figure 4).

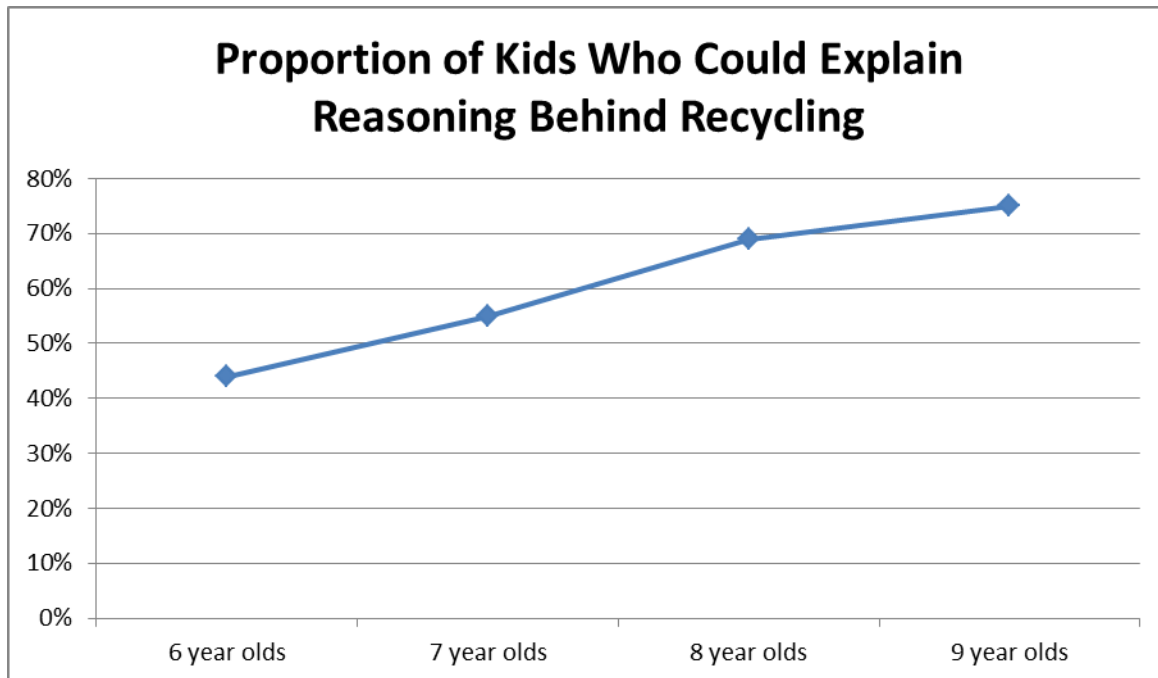


Figure 4: The percentage of kids within each age group who could explain why they recycle.

To try and get at the reasoning behind recycling in another way, we asked kids to explain what the consequences of “not recycling” might be. While some responses were apocalyptic, most illustrated that kids generally thought there might be significant consequences for not recycling. Some kids described the general impact on the environment:

“[There] would be trash everywhere.” – 6 year old, male

“There would be so much trash that no one could do anything.” – 7 year old, male

“The planet will start to die.” – 7 year old, female

“[The] Earth would not be clean.” – 8 year old, female

“It can make plants poisonous and the ground really dirty.” – 8 year old, female

“The trees would not be able to survive because there would be trash everywhere and we would not have a great environment.” – 9 year old, female

“It would be a dump...litter everywhere and no trees.” – 8 year old, female

Other kids (younger and older) focused on what they saw as the potential consequences for human beings:

“There would not be clean water when we take showers. You wouldn’t have any homes or water to drink. Homes would be disintegrated from all the stuff in the air.” – 6 year old, male

“If there is too much stuff we throw away, the air will have too much carbon dioxide and we will burn to death.” – 9 year old, female

“You would choke because the air gets polluted because of the trash on the ground. Trees and plants would die. Water would turn green.” – 8 year old, male

“[There would be] less food.” – 9 year old, female

“Without trees, we wouldn’t be able to breathe.” – 9 year old, male

“Lots of people and animals would get sick and die.” – 8 year old, female

“We could die if we don’t pick up the trash. The smell would take away the air.” – 7 year old, male

“It would be unsafe for people because the air would be dirty.” – 9 year old, female

Most kids demonstrated a partial understanding of the water cycle, but very few seemed to comprehend that water eventually gets re-used.

We asked kids to draw two pictures: one picture of where the water comes from before it gets to their home (sources) and another picture to show where the water goes after you pour it down the drain (destinations). Most kids (n = 40, 83%) demonstrated an understanding that the water in their homes’ pipes either comes from a larger body of water like a lake, river, pond or the ocean, or that the water comes from the rain. Fifteen (31%) of the kids mentioned rain or rain clouds as the original source of water for their homes.

With respect to destinations, a majority of kids (n = 30, 63%) kids demonstrated an understanding that wastewater eventually ends up in various bodies of water, including the ocean or sea.

Table 8:
Kids' Understanding of the Water Cycle

Sources / Destinations	Source of Water that Comes to the Home # and Percentage (N=48)	Destination of Wastewater that Leaves the Home # and Percentage (N=48)
Body of water (Ocean, lake, river, pond)	25 (52%)	30 (63%)
Faucet or pipes	20 (42%)	11 (23%)
Rain and clouds	15 (31%)	--
Sewer	--	16 (33%)
Filtering process	2 (4%)	2 (4%)
Water bottles	1 (2%)	--
Building	--	1 (2%)
Trash	--	1 (2%)
Person	--	1 (2%)
Underground	--	1 (2%)
No drawing	2 (4%)	3 (6%)

Note: Frequencies reflect that some drawings could be classified into multiple categories. Therefore the frequency does not add to 48 and the percentages will not total 100%.

But, only 12%—six out of the 48 kids (mostly 9 year olds)—seemed to comprehend the full water cycle, specifically making the argument that water eventually gets re-used. One seven year old drew a picture of a person as a destination, and explained that the water can be cleaned and re-used again. Other kids said:

“It is like a cycle - it goes back to the ocean and then the clouds get the water from the ocean.” – 9 year old, female

“It evaporates so we can use it again.” – 8 year old, male

“It can be used again if people clean it again and again.” – 9 year old, female

It's actually a cycle where clouds rain and the water goes into the ocean, dries up, goes into the air and turns back into clouds and rain," 9 year old, female

Figure 5 includes a sample of the kids' drawings. The two samples at the top illustrate drawings from kids who had a very basic understanding of the water cycle. The bottom two samples illustrate drawings from kids who had a more complete understanding of the water cycle.

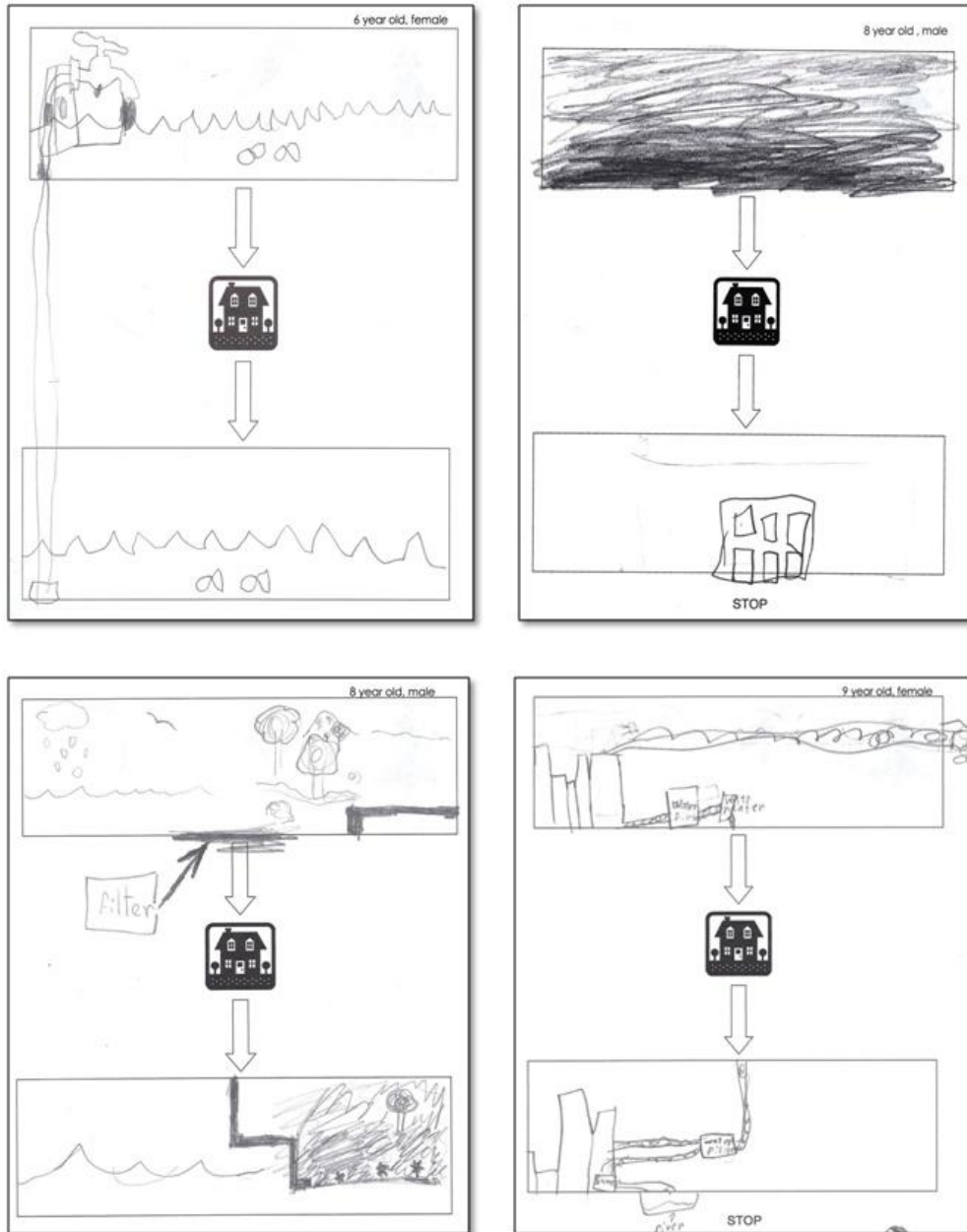


Figure 5: Sample pictures depicting “where the water comes from before it gets to your house and where it goes after it is poured down the drain.”

Few kids understood that water used by humans eventually gets re-used by bugs, animals, and plants.

To gain a deeper understanding about what kids know about the water cycle, during the focus group discussion, we asked kids to explain some other uses for water (besides home use). We wanted to see if kids had an understanding that other plants and animals use the same water, and that, because of the water cycle, water can be repeatedly re-used. As mentioned above, a small proportion of kids did demonstrate an understanding that water gets re-used by people. A handful of others (mostly 8 and 9 year olds) also explained how water used by humans eventually gets re-used by bugs, animals, and plants.

Most kids understood how water becomes polluted.

We also asked the kids to describe some things they thought might be bad for the water. Most kids were able to identify a variety of objects and substances that were bad for the water, including trash, oil and other fuels, dirt, rust from pipes, chemicals, pollution and sharp objects. In addition to naming objects or substances that can make water dirty, one child noted that “you shouldn’t cut down trees in a swamp.” Another noted that plastic six-pack holders can be harmful for the wildlife that lives in water.

Kids understood that trees are renewable, but did not demonstrate a clear understanding that some things (like water or birds) were not renewable.

To gain an understanding of whether kids understood that some resources were finite and that some were renewable, we asked the kids if almost all the trees, birds or water were almost gone from the world, which *one* might have the best chance to come back.³ During our discussion with kids, there was not a consensus among the kids as to which would have the best chance to come back: 27% of the kids said trees would be the most renewable, 27% of the kids said water was the most renewable and 29% of the kids said they just did not know. There were no significant differences between the genders or across race or age groups. Table 9 summarizes the responses from the kids.

³ Kids were expected to pick one answer to this question. Thus, the data should be interpreted carefully, as it might be possible that kids thought that more than one resource was renewable, but they weren’t able to make two choices. It’s also possible that they believed none of the resources was renewable, but because of the question format (forced choice) they had to choose one.

**Table 9:
Which would have the best chance to come back even after it had almost disappeared?**

Characteristic	Trees	Water	Birds	Trees and Water	Trees and Birds	Birds and Water	All three	No Answer
Total (N=48)	13 (27%)	13 (27%)	8 (17%)	5 (11%)	3 (6%)	2 (4%)	1 (2%)	3 (6%)
Gender								
Male	5 (38%)	9 (69%)	3 (38%)	1 (20%)	1 (33%)	1 (50%)	0 (0%)	2 (67%)
Female	8 (62%)	4 (31%)	5 (62%)	4 (80%)	2 (67%)	1 (50%)	1 (100%)	1 (33%)
Age								
Six years old	1 (8%)	2 (15%)	4 (50%)	0 (0%)	0 (0%)	1 (50%)	0 (0%)	1 (33%)
Seven years old	3 (23%)	4 (31%)	1 (13%)	0 (0%)	0 (0%)	1 (50%)	1 (100%)	1 (33%)
Eight years old	6 (46%)	4 (31%)	2 (25%)	2 (40%)	2 (67%)	0 (0%)	0 (0%)	0 (0%)
Nine years old	3 (23%)	3 (23%)	1 (13%)	3 (60%)	1 (33%)	0 (0%)	0 (0%)	1 (33%)

Note: Some kids circled more than one response, even though they were instructed to choose only one.

Most of the kids who chose trees agreed that they would come back because of their seeds and the ability to replant them. They said:

“[Trees are] easier to reproduce and there’s a lot right now and they give off a lot of seeds. Birds only lay one egg at a time and I don’t know if we can make water.” – 9 year old, male

“Trees usually have seeds and can replant themselves.” – 9 year old, female

“If trees are gone, you still have the seeds and you can plant them and they will come back.” – 8 year old, male

“Trees would drop seeds and then they would grow again.” – 8 year old, female

“You can plant a lot more.” – 7 year old, female

The kids who chose water believed that the rain would replenish the water, which again demonstrates that most kids did not have a complete understanding of the water cycle. Some kids said:

“The next time it rains there will more water.” – 9 year old, male

“[It] rains, [and] then the water will evaporate and then rain again.” – 8 year old, male

“There's oxygen in the air and it will come back as rain.” – 6 year old, male

Some of the younger kids held out hope that even if they were nearly extinct, birds would have the best chance at coming back. They said:

“They can always fly back home” – 6 year old, female

“[The birds can] fly back to their home” – 6 year old, female

“They leave and they can always fly back. – 7 year old, male

“[Birds would come back] because they have more than one egg at a time.” – 8 year old, male

To study the issue of finite resources further, we then asked the kids if there was another way to get paper if we didn't use trees. Many of the kids came up with a few solutions including recycling the paper we have now, but only one offered an explanation that involved using other resources to replace paper.

“[Use] animal hides or parchment. We use Whole Foods bag which are recycled.” – 8 year old, male

Kids demonstrated an understanding that species are interdependent.

We posed a few questions to the kids to assess their comprehension of species interdependency. The first question we posed was: “In the wild, wolves eat rabbits and rabbits eat clover. If more wolves moved in, what would probably happen to the amount of clover?” The majority of the kids (63%) correctly surmised that the amount of clover would increase. Seventeen percent said that the amount of clover would “stay the same” and 13% said it would “go down.” Eight percent of the kids didn't know. Table 10 summarizes the kids' responses.

**Table 10:
What would happen to the amount of clover?**

Characteristic	Go Up (N=30)	Stay the Same (N=8)	Go Down (N=6)	No Answer (N=4)
Gender				
Male	11 (37%)	4 (50%)	4 (67%)	3 (75%)
Female	19 (63%)	4 (50%)	2 (33%)	1 (25%)
Age				
Six years old	3 (10%)	1 (13%)	2 (33%)	3 (75%)
Seven years old	6 (20%)	1 (13%)	3 (50%)	1 (25%)
Eight years old	11 (37%)	4 (50%)	1 (17%)	0 (0%)
Nine years old	10 (33%)	2 (25%)	0 (0%)	0 (0%)

Next, we asked the kids why the world needs pests like mosquitoes. Most kids demonstrated an understanding that there was role for pests like mosquitoes and that these insects have an impact on other species. Most of the kids understood the necessity of mosquitoes as food for other animals and birds. One child hypothesized that if the world were to get too crowded with people, mosquitoes could help to control the population (through the spreading of disease). Some kids even wondered if mosquitoes were useful for eating other, smaller insects. Some kids also reported that mosquitoes serve the same purpose as bees in pollinating flowers and plants. Only four kids said the world did not need mosquitoes.

Kids did not demonstrate an understanding that factors that are “far away” can influence their own environment.

We asked the kids if they could think of anything that we need to survive, even though it might be far away and we could not see it. The most common response was air or oxygen. Kids understood that even though they could not see oxygen, it was necessary for their survival. A handful of kids also argued that they needed trees and leaves to survive because these produce oxygen. A couple of kids also argued that the sun, moon and stars were also necessary to their survival because they “give us energy” and “help things to grow.”

We then asked the kids to think of something far away that might hurt us/impact our environments, even though it could not easily be seen. Most kids’ responses centered around concrete, tangible things like animals and the threat to humans from animals and insects (like bears, wolves, coyotes, bees, ants, and sharks). When we asked kids to think about something

that could negatively impact their environment (besides wild animals) many of the kids could not come up with different answers. Other responses included meteorites crashing into the Earth (n = 4), the harmful rays from the sun (n = 2), volcanoes/lava (n = 2), smoke (n = 1), oil (n = 1), and thistles (n = 1).

Summary

This needs assessment was designed to develop an understanding of kids' knowledge, attitudes, and behaviors related to the environment and sustainability. The findings provide WGBH with some direction about topics and concepts to explore in the *Lost in Loop* series that is currently planned for development.

The kids in this study uniformly demonstrated positive attitudes towards the environment and reported practicing the “green habit” of recycling. Kids understood the impact that human beings can have on the environment from not recycling. Furthermore, kids demonstrated that they understood that different species share resources within the environment and that there is interdependency between species.

Following are the needs we identified in this study that WGBH may want to address for the new series:

- **Young kids need more information about sustainability and the rationale behind it.** We observed a difference in the depth of understanding about sustainability between the younger (6 and 7 year olds) and older (8 and 9 year old) kids. For example, while most kids reported they recycled, younger kids found it more difficult than older kids to explain the reasons why they engaged in this behavior.
- **Kids' understanding of the environment seemed limited to the concept of recycling.** Many kids equated the notion of the environment with recycling. It's possible that initiatives encouraging people to “go green” are teaching kids about the environment within the context of recycling in their communities and schools, but not extending learning beyond that. Thus, there appears to be an opportunity to educate kids in other aspects of the environment and to expand their thinking beyond recycling.
- **Kids may need more motivation to interact with nature.** While kids reported that they enjoyed playing outside, very few reported that their favorite activity included interacting with nature. Thus, there are opportunities to motivate kids to get outside and interact more with their natural surroundings.
- **Kids had an incomplete understanding of water as a cycle.** Most kids demonstrated only a partial understanding of the water cycle. Kids grasped the concept that the water they used might come from distant sources like oceans and rivers and that the rain was a source of their water. But, most kids did not demonstrate an understanding that water is re-used repeatedly via the water cycle.
- **Kids did not demonstrate a clear understanding that some resources are finite and that some things aren't renewable.** Kids demonstrated confusion about whether water is renewable and how living things might or might not be able to regenerate.
- **Kids need more information about factors influencing the environment.** Kids understood that they could have an impact on their environment. And, they

understood that there are unseen things that are essential to survival (like air). But, kids saw animals as more of a threat to their worlds than other unseen factors such as pollution.

Appendix: Focus Group Script

Overview

Purpose

The purpose of the focus groups is to gather data on what kids know and how kids feel about the environment and sustainability. Specifically, the goals are to assess:

Knowledge

- The extent to which kids understand that they are part of their environment and that people are part of ecosystems
 - The extent to which kids understand that something they do today can have a subsequent environmental impact in the future
 - The extent to which kids comprehend the reasons behind recycling
 - The extent to which kids know about water systems (i.e., where water comes from and where it goes)
- The extent to which kids comprehend that some living things are renewable and others are not
 - The extent to which kids understand how long it takes for something to grow back when we decide to use it (rate of regeneration)
 - The extent to which kids comprehend that some things (like water, air) don't grow back—that these resources can be degraded/polluted
- The extent to which kids know that all species have to share resources and that some resources are finite
- The extent to which kids comprehend that there are factors that can influence the environment, even if they cannot be seen

Attitudes

- The extent to which kids care about their environment

Behaviors

- The extent to which kids practice “green” habits
- The extent to which kids enjoy their environment (i.e., playing outside)

List of Materials

- Digital recorder
- Extra batteries
- Cash (\$30 per kid) in envelopes

- Focus group script
- Name tags – tent cards (blank and completed)
- Markers
- Parental consent forms
- Incentive receipts (for parents to sign)
- Basket of snacks
- Waters
- Notebook
- Copies of the Student Forms
- Pencils for kids
- Check-in list
- Copies of the Appearance Permission and Release Form (if applicable)

Script

Introduction

Time allotted: 5 minutes

Prior to entering the conference room, each parent will have given the moderator a signed informed consent form. Children that do not have a signed informed consent form will not be allowed to participate. The consent form explains the general purpose of the study and the rights each child has as a study participant. After the moderator has verified that each child has submitted his / her signed consent form, he / she will be directed to enter the conference room.

*Make sure each child has been given a chance to use the bathroom **before** you enter the conference room.*

After all participants have been seated, the moderator will begin timing and start with the script:

Hi, my name is _____. Thank you for coming in today. I work for a company that talks to kids to find out their ideas and opinions.

Today we're going to talk about the environment. Everyone will have a chance to say what they think, but it's important to follow the same kind of rules you follow in school:

[Write these on the whiteboard before group begins]

- **Please raise your hand if you have something to say,**
- **Don't interrupt anybody else if they're talking, and**
- **Be sure listen when others are talking.**

There are no right or wrong answers to any questions I have for you. I just want to know what you think.

Does anybody have any questions before we start?

[Begin recording]

I'm going to record our discussion so I don't have to worry about taking notes. I want to be able to give you my full attention.

Warm-up Discussion

Time allotted: 10 minutes

To start, I'd like to hear a little bit about you guys. So, I'm going to go around the room and ask you what your first name is and what grade you're in. Let's start with you. *Start with child immediately to the right.*

Great. Let's get started. Please raise your hand if you like playing outside.

Record number _____ and names for recording.

What's your favorite thing to do outside? *Allow kids a chance to raise their hand and speak. Make sure all kids get a chance to answer. Start at the left side of the room this time, so no pattern is established.*

Probe especially the kids who say they don't like to play outside. What is it about playing outside that they don't like?

Probe on any topic that goes beyond social interaction and is environmental based (i.e., topics that relate specifically to environmental factors that are natural and differ from inside environments).

Discussion

Time allotted: 45 minutes

Hand out Student Forms.

Today, we are going to talk about the environment. On the paper in front of you, please write your name.

Next, please draw a picture of the environment. You only have 2 minutes, so don't worry about lots of little details.

Give them a one minute warning.

Let's go around the room so we can hear about what everyone drew.

Ask all kids in Round Robin fashion: What did you draw? If a kid did not draw anything, ask them: What do you think about when you think of "the environment."

Have each kid explain their drawing.

OK, thanks for showing me your pictures. Now on the next page, I'd like you to tell me whether you think that you are part of the environment. If you think you are part of the environment, circle Yes. If you don't think you are part of the environment, circle No.

If you said No, can you tell me why you think that you are NOT part of the environment?

If you said Yes, can you tell me why you think that you ARE part of the environment?

Listen for perceptions of the environment. Is it a place to visit (the zoo or a nature trip)? Is it a place where exotic or cute animals live (parrots, polar bears)? Is it something we can take or leave?

On the next page, I'd like you to tell me whether you care about the environment. Please tell me whether you care a lot, a little, a tiny bit or not at all.

Ask all kids in Round Robin fashion: What do you do with something that you don't need anymore? If kids say, "throw it away," ask: Where do those things go when you don't need them anymore?

Now, on the next page, I'd like you to tell me whether you recycle or not. *If kids ask, any type of recycling counts.*

Ask each kid who said Yes: Can you tell me why you recycle?

Ask all kids in Round Robin fashion: Can anyone tell me what would happen to the environment if we don't recycle?

OK, now let's talk a little bit about water.

On the next page in your booklet is a picture of a house. Let's pretend it's your house. In the box above the house, I'd like you to draw a picture to tell me where the water in your house comes from...show me where the water comes from before it gets to your house. In the box below the house, I'd like you to draw a picture to tell me where the water goes after you pour it down the drain. You will have 4 minutes to draw on this page.

Give them a one minute warning.

Ask all kids in Round Robin fashion: What did you draw?

Have each kid explain their drawing.

If the kids only draw pipes, we want to probe to see if they understand the bigger picture, the water cycle. Do they include a river – but only if it's close enough to their house that they see it all the time? Would anyone draw a reservoir that's miles away? Ask them what comes before the

pipes, what comes before that, etc.? Do the pictures show how various bodies of water are connected (stream to river, etc.)? See how far their knowledge extends.

Ask all kids in Round Robin fashion: In your environment, what else is water used for? Probe: Who (or what) else uses water, too? Can water you use today day be used by another person (or a frog, plant, etc.) at a later time?

Ask all kids in Round Robin fashion: What are some things that are bad for the water?

On the next page of your booklet, there are three pictures. I'd like you to tell me if one day all of these things were almost gone from the world, which one would have the best chance to come back? Please circle one thing that could probably come back even after it had almost disappeared.

Ask all kids in Round Robin fashion: Which one did you pick?

Have each kid explain their answers.

Ask all kids in Round Robin fashion: "Who likes mosquitoes?" Probe: "So who can tell me, why does the world need them?"

Let's turn your booklets to the next page. It says "In the wild wolves eat rabbits and rabbits eat clover." I'd like you to tell me, if more wolves moved in, what would probably happen to the amount of clover?

Would it go up, stay the same, or go down if more wolves came to live where the rabbits live?

Ask all kids in Round Robin fashion: Which one did you pick?

Have each kid explain their answers.

Ask all kids: Where do we get paper from? If kids mention from recycling: Where does the paper come from if it's not recycled? If they say they get paper from trees: Is there another way to get paper if we don't use trees?

Ask all kids: Can you think of something far away that we need to survive, even though we can't see it?

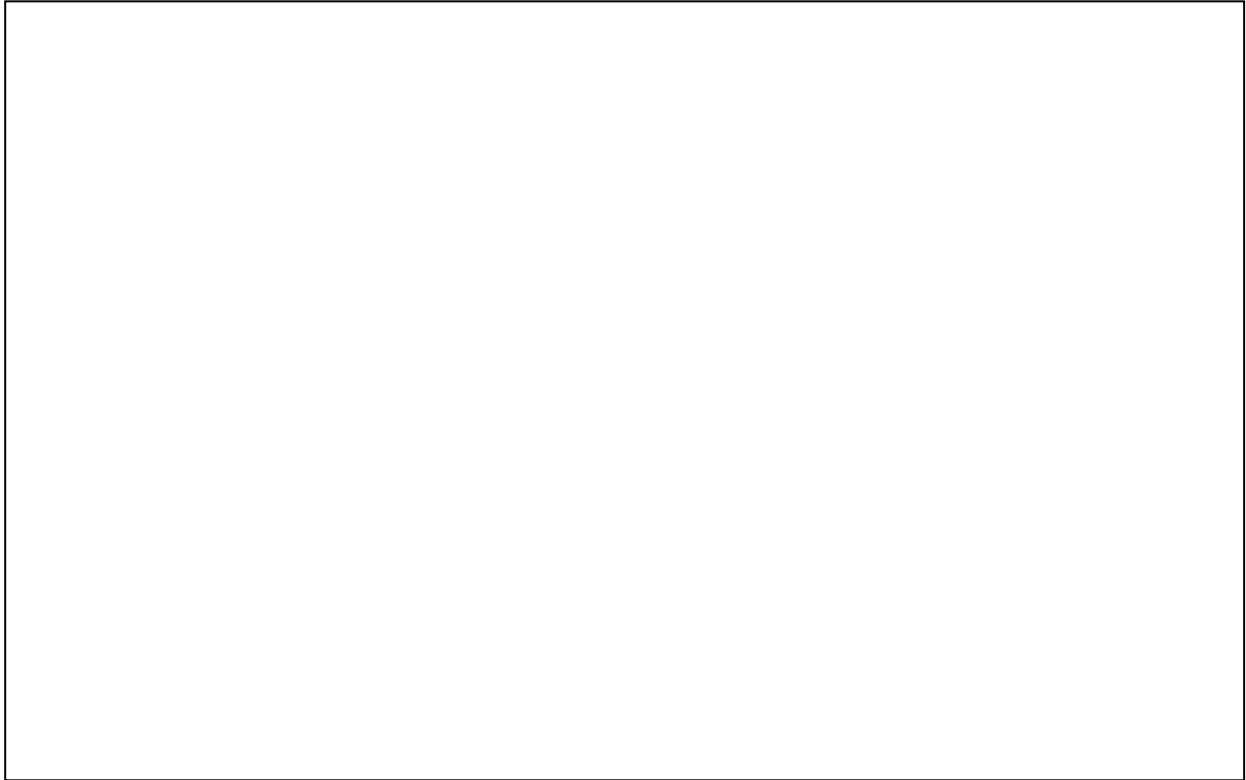
Ask all kids: Can you think of something far away that can hurt us, even though we can't see it?

Those are all the questions I have for you today. Does anyone have anything else they would like to tell us about the environment before we stop? Thank you for helping us. You've been very helpful today.

Appendix: Child Form

Name _____

Draw a picture of the environment:



STOP

Are you part of the environment?

No

Yes

STOP

How much do you care about the environment?

A lot

A little

A tiny bit

Not at all

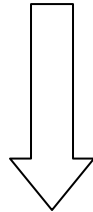
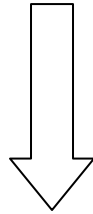
STOP

Do you recycle?

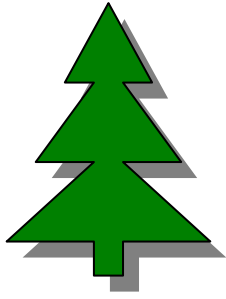
No

Yes

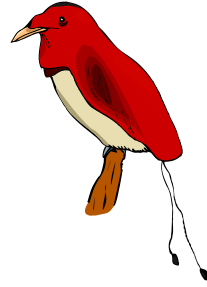
STOP



STOP



Trees



Birds



Water

STOP

In the wild, wolves eat rabbits and rabbits eat clover.

If more wolves moved in, what would probably happen to the amount of clover?

- a) Go up
- b) Stay the same
- c) Go down



STOP