



Green Camp Application Packet

Summer 2024 Green Camp Academic Enrichment Program The City of Memphis Storm Water Department

Contact:

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Storm Water Public Education Program Coordinator

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Green Camp is a FREE summer program that provides students with hands-on learning in relation to the topics of environmental engineering, chemistry, environmental issues, urban development, and storm water pollution. The City of Memphis Storm Water Department invites students entering and currently attending high school to participate in our Green Camp Environmental Academic Enrichment Program! Green Camp is scheduled from 8:30 am to 3:30 pm on the days provided in Table 1. Parents will be notified by phone if the excursions exceed 3:30 pm. Each group will attend 5 classes over a 1-week period (Monday through Friday) and must be prepared for a full 7 hours each day. Students can select a preferred week in the application section. Applications are due on April 26, 2024 and acceptance letters will be mailed by May 10, 2024 and confirm the group assignment. The assigned week will be based on a “first-received-application-first-assigned” basis with enough space for 26 participants (13 students per week).

Table 1: SCHEDULE

GROUP	Group 1	Group 2
ACTIVITY DATES	July 8 - 12, 2024	July 15 - 19, 2024

Again, there is no cost to participate in Green Camp. Boxed lunches will be provided daily! And by participating in the program, students will receive a Certificate of Participation with up to 35 hours of community service credits. To receive **the full 35 hours of community service hours, students must fully participate each day.**

With this application, students are asked for their hypothesis (page 9 of the application) regarding 3 subjects covered during the study. At the conclusion of Green Camp, each student will be asked to either write a scientific paper or create a tri-fold presentation or watershed model that supports or disproves their original hypothesis. The Storm Water Department requests the final paper, tri-fold, or model by August 2, 2024. Submittals will be reviewed by the Storm Water Department team and all qualified papers will be published on the City of Memphis website at MemphisStormWater.com. Tri-folds and models will be displayed at a special public event.

Students may reference <https://writing.colostate.edu/guides/guide.cfm?guideid=83> or instructions and format for the scientific paper. Students may reference <https://www.wikihow.com/Get-Your-Science-Fair-Tri-Fold-Noticed> for format of their presentation display on a traditional sized trifold board (36” h x 48” w) to be provided by the Storm Water Department.

Admission Requirements:

Each participant **MUST** complete and sign ALL application forms mentioned below and submit by **April 26, 2024**.

Each participant **MUST** agree to adhere to the Attire Code (noted on page 10, item 4) and have a ride to and from Benjamin Hooks Library (see next section). Boxed lunches will be provided on all days a student participates in activities unless declined by the student. Students will be performing tasks that involve walking, bending, lifting (not to exceed 20 lbs), sorting, and note-taking. An opportunity will be available for students to enter a waterway at multiple locations to gather their own water samples to analyze. Should the student feel uncomfortable collecting a sample at the designated sites, a sample will be gathered for them by a member of the Storm Water Department team. Activities are detailed on pages 3-7 of this packet. Personal Protective Equipment (PPE) will be provided for all activities.

Activity Pick-Up, Drop-Off, and Transportation:

Arrangements will be made by the City of Memphis to pick up participants from the Benjamin L. Hooks Library main entrance located at 3030 Poplar Avenue Memphis, TN 38111. The pick-up time will promptly be at 8:30 am. Please be on time. However, if notified in advance of a student's late arrival, the Storm Water Coordinator (Y. Sonia Holmes, cell 901-500-6346) will try to accommodate and include the student. Participants will be dropped off at that same location after the day's excursions at 3:30 pm for parent pick-up.

Application Submission Deadlines:

The following application forms must be completed and signed:

- ✓ Student Application form
- ✓ Regulations for Green Camp form
- ✓ Parental Consent for Green Camp form
- ✓ Liability Release Clause form

Please mail to:

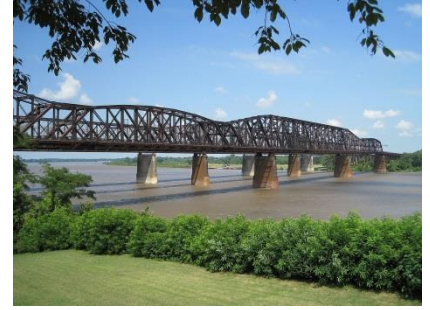
ATTN GREEN CAMP COORDINATOR
2865 Frayser Blvd., Rm 144
Memphis, TN 38127

Alternatively, the application forms can be scanned and emailed to yvette.holmes@memphistn.gov. If arrangements have been made between the teacher and the Storm Water Department Coordinator, a member of the Storm Water Department team will pick up the application forms at the school.

Completed application must be postmarked or emailed by Friday, April 26, 2024.

Acceptance letters will be postmarked or emailed no later than May 10, 2024.

Day One: Urban Development of Watersheds and Sources of Pollution



Supplies Provided by the City	Supplies Required from Student
Journal, writing utensils, activity sheets, backpack, Personal Protection Equipment, gloves, trash bags, calculators, scales, insect repellent, reusable water bottles, boxed lunch, and drinking water	Proper attire, towel, sunscreen, reusable water bottle, and eagerness to learn!

Activities:

Students will walk part of the Big River Crossing Bridge and observe the river and bluff as it is now and compare it to historical maps. Students will see and learn how the Mississippi River has been channelized due to commerce and how the rivers and tributaries to the Mississippi have been channelized in different ways (natural and concrete channelization will be discussed and assessed throughout the study). Students will be able to see from a distance the impervious area of the City and will learn about the measures added to provide flood control, including the City’s Municipal Separate Storm Sewer System (MS4). The history of the Gayoso Bayou will be discussed and location will be visited. Students will also learn about the source of Memphis’ drinking water in the past and in the present. (Location: Big River Crossing Bridge: Latitude 35.1264, Longitude -90.0720: Approximate duration 1.5 hour)

Students will learn about the Mississippi River Watershed and the watershed effect as it pertains to storm water runoff as well as the urban water cycle. Seeing historical maps and the current City riverfront will give the students a visual perspective on urban development and the urban water cycle. Students will visit Tom Lee Park and be introduced to the implementation of green infrastructure in urban development and its effects on the urban water cycle and storm water management. Students will also visit green infrastructure examples at the UT Baptist Research Park and BridgesUSA. (Location: Tom Lee Park: Latitude 35.1376, Longitude -90.0617: UT Baptist Research Park/Tri-Metis Laboratory: Latitude 35.1392, Longitude: -90.0303, Bridges USA: Latitude: 35.1564, Longitude: -90.0434: Approximate duration 2 hours)

Students will walk the Mississippi River model on Mud Island to better understand the connection between their respective watershed to the Mississippi River watershed. Students will visit the mouth of the Wolf River to the Mississippi River at Harbortown. Throughout the day’s study, the students will learn to recognize point and non-point source pollution. The students will gain a better perspective on the effects of improper waste disposal and how this practice can negatively affect our environment and the public health of our citizens. (Location: Mud Island: Latitude 35.14886223, Longitude -90.05206118: Harbortown: Latitude -35.18030245, Longitude -90.05691913 Approximate duration 3.5 hours)

Day Two: Urban Waterways, Wetlands, and Storm Water Management



Supplies Provided by the City	Supplies Required from Student
Journal, writing utensils, activity sheets, backpack, binoculars, field guide, insect repellent, water bottles, boxed lunch, drinking water, lab field testing equipment and meters, field microscopes, magnifying glasses, appropriate PPE	Proper attire, sunscreen, reusable water bottle, backpack, and eagerness to learn!

Activities:

Students will observe sources of litter and be able to distinguish the two types of pollution, point and non-point source. Students will learn how litter is carried to waterways. Students will participate in a cleanup at McKellar Lake (Nonconnah Creek Watershed). Students may alternatively participate in a cleanup at Alonzo Weaver Park and storm drain marking in the neighborhood. Litter collected will be divided by recyclable and non-recyclable, counted and/or weighed, and recorded. From this, students will be asked to determine the decomposition times of each type of trash and what percentage of the trash is recyclable. Students will be able to learn and identify proper disposal methods for each type of trash gathered. (Location: Corner of Jack Carley Causeway and W. Trigg Ave: Latitude 35.11186428, Longitude -90.07940314, and/or Alonzo Weaver Park: Latitude 35.05759999, Longitude -90.08866099 (Approximate duration 1.5 hours)

Students will learn about types of chemical pollution not captured by traditional clean-ups and their effects on the environment. Students will learn about the chemical filtering properties of certain wetland plants. The urban man-made wetland at T.O. Fuller State Park and the urban natural wetland at Alonzo Weaver Park will be visited. Students will learn about the physical/hydrological, biological, and chemical functions of a wetland. Students will participate in a field wetland assessment and be asked to find and identify key plants and wildlife (or evidence of animals via tracks and scat) through a nature walk and utilizing binoculars within the wetland. Students will learn about the use of wetlands as a storm water quality control measure as well as an engineered flood mitigation tool while viewing South Cypress Creek at Alonzo Weaver Park. (Location: T.O. Fuller State Park Wetlands: Latitude 35.0680, Longitude -90.1020: Alonzo Weaver Park: Latitude 35.05759999 Longitude -90.08866099 (Approximate Duration: 3 hours)

Students will test for evidence of chemical pollution at an urban natural waterway (South Cypress Creek at Alonzo Weaver) and a channelized waterway (Cypress Creek at Tillman St. and Summer Ave.). Students will gather samples and perform temperature, pH, copper, phenols, DO, and chlorine field tests. Students will reference their sampling activity sheets to record results and discuss possible pollution sources of abnormal amounts. A visual assessment will be performed for life within and around each waterway. Students will make an assessment on the waterway's condition from the evidence that they have found. (Location: Cypress Creek at Tillman and Summer: Latitude 35.1481 Longitude -89.9592: Approximate duration 2.5 hours)

Day Three: Rural Waterways, Wetlands, and the Memphis Sands Aquifer



Supplies Provided by the City	Supplies Required from Student
Journal, writing utensils, activity sheets, backpack, lab field testing equipment and meters, field microscopes, magnifying glasses, binoculars, field and dichotomous guide, dip nets, sampling buckets, insect repellent, appropriate PPE (including footwear), boxed lunch, & drink water.	Towel, sunscreen, proper attire, reusable water bottle, backpack, and eagerness to learn!

Activities:

Much of this day (approximate estimate 2-1/2 to 3 hours) will be spent traveling to and from rural locations.

At Bateman Bridge, a safe and easy access sampling point exists at a rural, natural waterway (Wolf River Watershed) for students to perform chemical and biological sampling. Students will gather samples and will perform the same chemical tests as they did at Cypress Creek, an urban concrete channelized waterway. Students will reference their sampling activity sheets to record the result of each test and discuss possible pollution sources of abnormal results. Students will also perform biological sampling for bioindicators of stream health. Macroinvertebrates gathered will be examined with microscopes and/or magnifying glasses and identified with the dichotomous key. Students will utilize their Benthic Macro Activity Sheet to identify the macroinvertebrate pollution tolerance. A visual assessment will be performed for life within and around the natural waterway. Students will make an assessment on the waterway’s condition from the evidence that they have found. (Location: Bateman Bridge Moscow, TN: Latitude 35.0276, Longitude -89.3500: Approximate duration (2-3 hours)

The rural natural wetland, Ghost River State Natural Area on the Winbon B. Cowan Trail, will be visited. Students will identify the physical/hydrological, biological, and chemical functions of a wetland. Students will participate in a field wetland assessment and be asked to find and identify key plants and wildlife (or evidence of key animals via tracks, food, scat, etc.) through a nature walk and utilizing binoculars within the wetland. Students will note the differences between the rural wetland (Mineral Slough Boardwalk) and urban man-made wetland (T.O. Fuller). (Location: Mineral Slough at Beasley Drive, La Grange, TN: Latitude 35.0269, Longitude -89.2724: Approximate duration 1-1/2 hours)

At Pine Crest Camp, students will be able to view the natural layers of soil, sand, silt, and clay (which are the properties of the aquifer) in this natural eroded area where the layers are visible. Students will learn that this area is part of the Wolf River that is down stream of the headwaters at Baker’s Pond. It will be reiterated that Memphis drinking water comes from the aquifer, not the River. Students will learn the importance of the geographic layers present for the filtration and protection of the Memphis Sand Aquifer. (Location: Pine Crest Camp, 21430 Hwy 57, Moscow, TN 38057: Latitude, 35.0520, Longitude: -89.3495. Approximate duration 2 hours)

Day Four: Watershed Stewardship, Sustainability, and Behavioral Change



Supplies Provided by the City	Supplies Required from Student
Journal, writing utensils, activity sheets, backpack, lab field testing equipment and meters, field microscopes, magnifying glasses, binoculars, field and dichotomous guide, dip nets, sampling buckets, insect repellent, appropriate PPE (including footwear), boxed lunch, and water	Proper attire (especially footwear), sunscreen, reusable water bottle, and eagerness to learn!

Activities

Students will explore Meeman-Shelby Forest State Park (Loosahatchie River Watershed) and discover the connections of natural systems and human impact. Students will participate in fun, educational activities to reinforce their knowledge of environmental and storm water awareness issues and behavioral change. Students will embark on a nature walk to a natural spring, a point at which water flows from a groundwater source to the Earth's surface. Chemical water testing of the spring will be performed to compare with collected samples from urban and non-urban surface waterbodies (where water has been exposed to explored variables). Students will identify various flora and fauna and compare the data to other visited ecosystems. From multiple observations and collected data, students will discuss environmental issues while strengthening their problem-solving skills. Students will discuss common, everyday behaviors that contribute to storm water pollution and as well as behaviors to diminish or eliminate such pollution. Students will explore their knowledge of watersheds and compare their observations from the three watersheds visited (Nonconnah, Wolf, and Loosahatchie). Students will review and discuss the impacts of urban development in the watersheds by participating in fun activities and games led by the Project Coordinator. Such activities/games may include, but are not limited to a scavenger hunt, a demonstration of the EnviroScape Watershed model, Recycle Re-shop Remix (relay game), Watershed Trivia Feud (trivia game show style), Don't Break the Planet, Why Are You So Green? (Environmental debates), One For All (Population Education activity), and more. All activities are designed to reinforce and enhance understanding of the material prior to the students' work on their chosen project. Students will decide whether their data and observations from the week will be used to produce a scientific paper, a tri-fold presentation, or a watershed model (with accompanying essay). Students will begin a preliminary outline of their scientific paper, trifold essay, or model presentation essay. Students will be encouraged to explore and enjoy the surrounding natural environment of the state park. (Location: Meeman-Shelby Forest State Park: Latitude 35.3337, Longitude: -90.0684: Approximate duration: 7 hours)

Day Five: Reflection and Review



Supplies Provided by the City	Supplies Required from Student
Resources from the Benjamin L. Hooks Library and support from the instructors to answer questions and assist with information for the scientific paper submittal or presentation display.	A lunch beverage, backpack with all information/results gathered in the previous 4 days, and eagerness to learn!

Activities: Note – Students will spend day at the library on July 12 and at Lucius Burch State Natural Area on July 19

The students will meet at the Benjamin L. Hooks Library at 8:30 AM. Pick up time by parents is 2:30 PM. With this application, students are asked for their hypothesis (page 9 of the application) in regard to 3 subjects covered during the study. At the conclusion of Green Camp, students will be asked to write a scientific paper, create a tri-fold presentation or watershed model display (both with accompanying essay) that communicates their results. Students will reflect and review their data from Green Camp and gather additional research. The instructor will help the students by reviewing results, guiding discussions, offering additional resources, and stressing factual content/research.

Students may reference <https://www.columbia.edu/cu/biology/ug/research/paper.html> for instructions and format for the scientific paper. Students may reference <https://www.wikihow.com/Get-Your-Science-Fair-Tri-Fold-Noticed> for format of their presentation display on a traditional sized trifold board supplied by the Storm Water Department.

The Storm Water Department requests final paper, tri-fold, or model by **Friday, August 2, 2024**. Submittals will be reviewed by the Storm Water Department team and all qualified papers will be published on the City of Memphis website at MemphisStormWater.com. Tri-folds/models will be displayed at a special public event (see below). The Storm Water Department team is looking for submissions to meet research (with properly documented reference sources), factual content (which must be supplemented with their documented research or documented reference sources), and basic format standards. The student's individual hypothesis and conclusion is not reason for a paper to be unpublished or tri-fold/model not be displayed *so long as they properly support it with reference and research!*

All students will also be recognized during a special event held to honor students participating in pollution prevention activities with Memphis Storm Water, where they will receive their Certificate of Participation with their community service hours (not to exceed 35). Participants who submit a publishable paper or presentable tri-fold/model display that has been approved by the Storm Water Department team will also receive a Certificate of Completion for finishing their study that verifies the publication of the paper on our website or the display of the trifold/model at this special event.



Student Application Form

Name: (first, middle, last) _____

Age: _____ **School:** _____ **Grade during GC:** _____

Address: _____ **Phone:** _____

City: _____ **State:** _____ **Zip:** _____

T-Shirt Size: _____ **Student email:** _____

Boot Size: _____ **What Careers Are You Interested In?** _____

Lunch Preferences: The City of Memphis Storm Water Department is prepared to supply each participant with a boxed sandwich lunch. Please list any allergens and your preference between meat or veggie sandwich type below: *Please notate if you elect to supply your own bagged lunch, and note that there will be no refrigerator, microwave, or any oven on any and all days.*

Preference Dates: Green Camp will be offered during the week (Monday through Friday) of July 8-12 and July 15-19, 2024. Please circle your preferred week to participate. Preference 1 will be the first choice and Preference 2 will be 2nd choice. Groups will be assigned and confirmed with the acceptance letter mailed or emailed by May 10, 2024. Weeks will be assigned on a “first-come-first-approved” basis and there are only enough spaces for 26 participants (13 students per week). Only circle the week that you can attend. If you cannot attend one week, leave the appropriate preference selection blank.

Preference 1:

Group 1
July 8 - 12

Preference 2:

Group 2
July 15 - 19

STUDENT HYPOTHESES IDEAS: *This section needs to be filled out for your final paper or tri-fold presentation!*

Does Memphis have an adverse effect on the quality of the water in its rivers and waterways? Briefly explain the reasoning for your answer based on your current knowledge and assumptions.

How do you have a direct effect on the quality of water and/or the environment in Memphis? Briefly explain your answer based on your current knowledge and assumptions.

What daily actions can you do to promote environmental sustainability in Memphis? Briefly explain your answer based on your current knowledge and assumptions.

Program participation will not be permitted without Parent/Guardian signature on these forms. These forms are for the health and safety of the participant.

STUDENT SIGNATURE REQUIRED. PLEASE READ CAREFULLY.

I have read the Program description and I will actively participate in all parts of the Program as described (with the exception to certain sampling activities, in which I can request to have a sample gathered for me to analyze). I agree to be respectful, listen, and follow instructions. I understand that my photo and scientific paper/presentation may be used for promotional purposes. I will wear the provided T-Shirt and follow the rules of attire. I understand that I will be in an outdoor setting and may be exposed to outdoor elements.

Printed Name of Participant

Signature of Participant

Date

PARENT/GUARDIAN PERMISSION STATEMENT

I hereby grant permission for my child to apply and fully participate. Also, I will allow my child to complete surveys to evaluate the Program. I grant permission for my child to be daily transported to sites.

Printed Name of Parent/Guardian

Signature of Parent/Guardian

Date



Regulations for Green Camp

We are pleased you are interested in participating in the City of Memphis Storm Water Department Green Camp! While we do not want to limit your learning experience, we do require that you pay close attention to a few rules of order. We are responsible for your safety and well-being and will supply appropriate Personal Protective Equipment (PPE). We must also achieve the academic guidelines of this Program.

1. We expect you to display courtesy, generosity, and high moral stature for yourself and toward your peers, staff, and guests.
2. You may only use cell phones for documentation purposes or emergencies during activities or lessons.
3. Students should report tardiness and absences to the Coordinator (Y. Sonia Holmes cell 901-500-6346). Reporting tardiness does not guarantee participation for the day due to the tight schedule, but the Coordinator will make all best efforts if notified.
4. Students must wear closed-toe shoes suitable for urban and rural walking excursions. Students must not wear overly-revealing clothing (transparent material) and improperly fitted clothing (sagging or inappropriate fitting attire). Shorts must not be shorter than 4 inches above the knees. Students will be supplied 2 T-Shirts. The t-shirt MUST be worn for the entire duration of all planned activities.
5. Students must email their scientific paper to stormwater@memphistn.gov by **August 2, 2024**. Papers will not be graded; they are being requested to gauge effectiveness of the Program. However, papers must be of certain quality to be published. If a student chooses to instead complete a tri-fold presentation display, this will also be requested by **August 2, 2024**. Students should contact Coordinator, Y. Sonia Holmes, for arrangements to have display dropped off or picked up. All participating students will receive a *certificate of participation* with community service hours for the amount of time participated in the study, not to exceed 35 hours. Students who submit a publishable scientific paper or approved tri-fold presentation display will receive a *certificate of completion* and additional honors and awards herein.

I HAVE READ AND UNDERSTAND THE ABOVE REGULATIONS.

Printed Name of Student

Signature of Student

Date

Please indicate any particular medical problems such as medications being taken, allergies, etc. that the person in charge and/or any attending medical person should be aware of:

I give my permission for any medical treatment that may be necessary in case of an emergency involving my child.

Printed Name of Guardian

Signature of Guardian

Date



Parental Consent for Green Camp

This release and information form must be filled out completely with current information, signed, and turned in before the Participant will be allowed to attend the Program.

This is a legally binding agreement executed by:

Name of Participant/Student: _____

Residential Address: _____

City, State, Zip: _____ Phone Number: _____

Date of Birth: _____ Age: _____

(hereinafter referred to as "Participant"), and by,

Name of Parent or Guardian: _____

Relationship of Guardian to Participant: _____

Residential Address: _____

City, State, Zip: _____ Phone Number: _____

(hereinafter referred to as "Parent/Guardian"),

to The City of Memphis Storm Water Department, a division of the City of Memphis Public Works (hereinafter, "City").

We, the undersigned, request that Participant be granted permission to participate in the Storm Water Green Program (hereafter "Activity") to be conducted by the City of Memphis Storm Water Department for the full work weeks of July 8-12 or July 15-19, 2024 (to be assigned after acceptance). Participant's involvement will include, but is not limited to, the following activities: to be transported in a bus to various sites described in the schedule, assist the City of Memphis Storm Water Department in activities designed by them, and participate in various educational exercises.

In the event of illness, I authorize the securing of necessary treatment.

In case of emergency, the following person should be contacted:

Name: _____

Address: _____

Home Phone: _____ Work Phone: _____

Mobile Phone: _____ List preferred phone type: _____

Medical Information on Participant:

Allergies: _____

Medical Insurance Carrier (If none, write "none"): _____

Policy Number: _____

Doctor (If no PCP, write "none"): _____

Office Phone: _____

I fully understand and acknowledge that: my participation in this Program has inherent risks, dangers and hazards; that my participation in such activities may result in injury; and by my participation in these activities and, I hereby assume all risks and dangers and all responsibility for any losses and/or damages, whether caused in whole or in part by the negligence or other conduct of the officers, agents, officers, or employees of the City of Memphis, or by any other partnering organization.

The City of Memphis reserves the right to cancel any activity or event included as part of Activity or prevent Participant from participating in such activities or events, if, in the City's sole judgment, Participant's participation in such activities may seriously endanger Participant, other participants, or otherwise be harmful or inconsistent with the rules and regulations of City and all applicable policies and guidelines of the Storm Water Green Camp Program.

Parent/Guardian further states that I/We am/are the Participant's legal parent or guardian, and am fully competent to sign this Agreement; and that I execute this Agreement for full, adequate, and complete consideration fully intending to be bound by the terms herein.

LIABILITY RELEASE CLAUSE

The undersigned hereby releases and holds harmless the City of Memphis, its Mayor and Council, and any officers, employees or agents thereof (collectively referred to as Releasees), from any and all claims, liabilities or demands whatsoever arising or claimed to have arisen out of the enrollment or participation in the Program by the participant herein, regardless of whether such loss is caused by the negligence of the Releasees. This release shall survive the expiration or termination of this activity. I also hereby consent to the sponsor’s use of my child’s name, likeness or participation in the event for public purposes.

INDEMNIFICATION CLAUSE

Additionally, the undersigned agrees to indemnify and hold harmless the City of Memphis, its officers, agents, and employees from and against any and all claims, demands, suits, actions, damages, or other liabilities of any kind or character, arising out of or in connection with any activities performed in connection with this Program. This obligation shall survive the expiration or termination of this activity.

IN WITNESS WHEREOF, we have executed this release this _____ day of _____, 20__.

BOTH PARTICIPANT AND PARENT/GUARDIAN MUST READ BEFORE SIGNING.

Printed Name of Participant

Printed Name of Guardian

Signature of Participant

Signature of Guardian

Relationship of Guardian to Participant