

# Stormwater SMART 1<sup>st</sup> Grade Programs for 2012 NC Essential Standards

1.L.1: Understand characteristics of various environments and behaviors of humans that enable plants and animals to survive:

**L1.1** – Recognize that plants and animals need air, water, light (plants only), space, food and shelter and that these may be found in their environment.

Activities:

- ◆ **Life Box** – Through a thought provoking activity, students discover four essential, interdependent factors needed to sustain life (indoor).
- ◆ **Water Audit** – Students discuss water sources and water conservation concepts, conduct a home and school water audit, and compare and contrast results with and without the implementation of water conservation practices. Then they make recommendations for personal conservation strategies at home (indoor).

**L1.3** – Summarize ways that humans protect their environment and/or improve conditions for the growth of the plants and animals that live there.

Activities:

- ◆ **A-maz-ing Water** - Negotiate a maze to investigate nonpoint source pollution and discuss conservation practices (indoor).
- ◆ **There is no Away** – Students take a close look at everyday trash and learn how it can be reused, recycled or composted to take control of their trash and help keep litter out of our waterways (indoor). Can be combined with a school yard clean-up (outdoor).

1.L.2: Summarize the needs of living organisms for energy and growth

**L2.1 and L2.2** – summarize the basic needs of a variety of different plants and animals (including air, water, nutrients and light) for energy and growth

Activities:

- ◆ **Life Box (K-2 option)** – Through a thought provoking activity, students discover four essential, interdependent factors needed to sustain life (indoor).

## Social Studies:

1.G.1: Use geographic representations, terms and technologies to process information from a spatial perspective.

**1G.1.1** – use geographic tools to identify characteristics of various landforms and bodies of water.

Activities:

- ◆ **Blue Planet (k-2 option)**– Students estimate the percentage of the earth’s surface that is covered by water and use simple probability to check their estimates (indoor and outdoor).
- ◆ **Enviroscape Model**® – Watershed model assists students in identifying characteristics of landforms and bodies of water (indoor).

# Stormwater SMART 3<sup>rd</sup> Grade Programs for 2012 NC Essential Standards

3.E.2 :Compare the structures of the Earth's surface using models or three-dimensional diagrams.

3.E.2.1 :Compare Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).

Activities: The activities below can be combined for a fun interactive 45minute/ 1 hour program

- ◆ **Blue Planet** – Students estimate the percentage of the earth's surface that is covered by water and use simple probability to check their estimates (indoor).
- ◆ **Blue River** – Students participate in a whole body exercise to simulate the movement of water through a river and its watershed (indoor).

3.E.2.2: Compare Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by using models, pictures, diagrams, and maps.

Activities: The activities below can be combined for a fun interactive 45minute/ 1 hour program

- ◆ **Blue River** – Students participate in a whole body exercise to simulate the movement of water through a river and its watershed (indoor).
- ◆ **Seeing Watersheds** – Students use maps to characterize what a watershed is, to identify key parts and functions of watersheds, to determine boundaries and how water flows in a watershed based on elevation (indoor).
- ◆ **Enviroscape Model**® – Students investigate how water flows through land features and connects watersheds using an interactive 3-D model. This activity is non-point source pollution intensive (indoor).

## **3.L.2: Understand how plants survive in their environments.**

3.L.2.4: Explain how the basic properties (texture and capacity to hold water) and components (sand, clay and humus) of soil determine the ability of soil to support the growth and survival of many plants.

Activities:

- ◆ **Life Box** – Through a thought provoking activity, students discover four essential, interdependent factors needed to sustain life (indoor).
- ◆ **The Dirt on Soil** - Students discover how different soil types absorb and filter water and learn how the basic components of soil affect erosion (indoor and outdoor options).

# Stormwater SMART 4<sup>th</sup> Grade Programs for 2012 NC Essential Standards

## **4.L.1: Understand the effects of environmental changes, adaptations and behaviors that enable animals (including humans) to survive in changing habitats.**

4.L.1.1: Give examples of changes in an organism's environment that are beneficial to it and some that are harmful.

Activities:

- ◆ **Enviroscape Model**® – Students investigate how water flows through and connects watersheds using an interactive 3-D model. This activity is non-point source pollution intensive (indoor).
- ◆ **There is no Away** – Students take a close look at everyday trash and learn how it can be reused, recycled or composted to take control of their trash and help keep litter out of our waterways and reduce mosquito habitat(indoor). Can be combined with a school yard clean-up (outdoor).

4.L.1.3: Explain how humans can adapt their behavior to live in changing habitats (e.g., recycling wastes, establishing rain gardens, planting trees and shrubs to prevent flooding and erosion).

Activities:

- ◆ **Enviroscape Model**® – Students investigate how water flows through and connects watersheds using an interactive 3-D model. This activity is non-point source pollution intensive (indoor).
- ◆ **Rain Garden Design and Function** – Students investigate how rain gardens filter out pollutants caused by human behaviors and how they can be designed to fulfill human demands (indoor and outdoor options).
- ◆ **Blue Traveler** – Students investigate how humans impact the water cycle (indoor).
- ◆ **Watershed Game** – Students play a game showing how different human behaviors positively and negatively affect the watershed (indoor).

# Stormwater SMART 5<sup>th</sup> Grade Programs for 2012 NC Essential Standards

## **5.P.2: Understand the interactions of matter and energy and the changes that occur.**

5.P.2.1: Explain how the sun's energy impacts the processes of the water cycle (including evaporation, transpiration, condensation, precipitation and runoff).

Activities:

- ◆ **The Incredible Journey** – Students simulate the movement of water within the water cycle and identify the role of pollution (indoor/outdoor).

## **5.L.2: Understand the interdependence of plants and animals with their ecosystem.**

5.L.2.2: Classify the organisms within an ecosystem according to the function they serve: producers, consumers, or decomposers (biotic factors).

Activities:

- ◆ **Enviroscape Model**® – Students investigate how water flows through and connects ecosystems using an interactive 3-D model. This activity is non-point source pollution intensive and can be used to demonstrate or discuss producers, consumers and decomposers (indoor).

5.L.2.3: Infer the effects that may result from the interconnected relationship of plants and animals to their ecosystem.

Activities:

- ◆ **Invaders** – Students learn what aquatic invasive species are and then participate in a full-body movement game that simulates competition for habitat and resources; students also create graphs and find out about the prevention and management of aquatic invasive species (indoor).
- ◆ **Stream Watch** – Students learn how plants and animals interact in their aquatic ecosystems by sampling the bugs (indoor modeling or outside leafpacks) and learning how macroinvertebrates are assessed (indoor or outdoor options).
- ◆ **Virtual Water** – Students create a “water web” to illustrate their dependence on water and the interdependence among water users, producers and people worldwide (indoor).

# Stormwater SMART 7<sup>th</sup> Grade Programs for 2012 NC Essential Standards

## **7.E.1: Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth's atmosphere, weather and climate and the effects of the atmosphere on humans**

7.E.1.2 – Explain how the cycling of water in and out of the atmosphere and atmospheric conditions relate to the weather patterns on earth

Activity:

- ◆ **The Incredible Journey** – Students simulate the movement of water within the water cycle and identify the role of pollution (indoor/outdoor).

## **7.G.2: Apply the tools of a geographer to understand modern societies and regions**

7.G.2.1 – Construct maps, charts, and graphs to explain data about geographic phenomena (e.g. migration patterns and population and resource distribution patterns)

Activity:

- ◆ **Color Me a Watershed** – Through the interpretation of maps, students observe how development can affect a watershed (indoor)

7.G.1.3 – Explain how natural disasters, preservation efforts and human modification of the environment affect modern societies and regions.

Activities:

- ◆ **Seeing Watersheds** – Students use maps to characterize what a watershed is, to identify key parts and functions of watersheds, to determine boundaries and how water flows in a watershed based on elevation (indoor).
- ◆ **Storm Water** – Students learn how water travels through a community and how it can be managed to reduce the impact of stormwater runoff (indoor).
- ◆ **Invaders** – Students learn what aquatic invasive species are and then participate in a full-body movement game that simulates competition for habitat and resources; students also create graphs and find out about the prevention and management of aquatic invasive species (indoor).
- ◆ **There is no Away** – Students take a close look at everyday trash and learn how it can be reused, recycled or composted to take control of their trash and help keep litter out of our waterways (indoor). Through this activity we can also explore the cause and spread of West Nile Virus in America. Can be combined with a school yard clean-up (outdoor).

# Stormwater SMART 8<sup>th</sup> Grade Programs for 2012 NC Essential Standards

8.E.1: Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans.

8.E.1.1: Explain the structure of the hydrosphere including:

- Water distribution on earth
- Local river basins and water availability

Activities:

- ◆ **Blue Planet** – Students estimate the percentage of the earth’s surface that is covered by water and use simple probability to check their estimates (indoor and outdoor).
- ◆ **Blue River** – Students participate in a whole body exercise to simulate the movement of water through a river and its watershed (indoor and outdoor options).
- ◆ **Enviroscape Model**® – Students investigate how water flows through and connects watersheds using an interactive 3-D model. This activity is non-point source pollution intensive (indoor).
- ◆ **Watershed Game** – students play a game showing how different human behaviors positively and negatively affect the watershed (indoor).
- ◆ **Get the Groundwater Picture** – Students learn about basic ground water principles as they create their own geologic cross section or Earth window (indoor).

8.E.1.3: Predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including:

- Temperature
- Dissolved oxygen
- pH
- Nitrates and phosphates
- Turbidity
- Bio-indicators

Activities:

- ◆ **Stream Watch/Ask the Bugs!** – Students learn how plants and animals interact in their aquatic ecosystems by sampling the bugs (indoor modeling or outside leafpacks) and learning how macroinvertebrates are assessed (indoor or outdoor options).
- ◆ **Enviroscape Model**® – Students investigate how water flows through and connects watersheds using an interactive 3-D model. This activity is non-point source pollution intensive (indoor).

- ◆ **Macroinvertebrate Mayhem** – Students play a game of tag to simulate the effects of environmental stressors on macroinvertebrate populations (outdoor).
- ◆ **A Snapshot in Time** – Students use topographic (contour) maps to explore the concept of a watershed and then apply that knowledge to watershed monitoring (indoor).

8.E.1.4: Conclude that the good health of humans requires:

- Monitoring of the hydrosphere
- Water quality standards
- Methods of water treatment
- Maintaining safe water quality
- Stewardship

Activities:

- ◆ **Enviroscape Model**® – Students investigate how water flows through and connects watersheds using an interactive 3-D model. This activity is non-point source pollution intensive (indoor).
- ◆ **Storm Water** – Students learn how water travels through a community and how it can be managed to reduce the impact of stormwater runoff (indoor).
- ◆ **Watershed Game** – students play a game showing how different human behaviors positively and negatively affect the watershed (indoor).
- ◆ **Get the Groundwater Picture** – Students learn about basic ground water principles as they create their own geologic cross section or Earth window (indoor).
- ◆ **A Grave Mistake** – Students analyze data to solve a mystery and identify a potential polluter (indoor).

8.L.3: Understand how organisms interact with and respond to the biotic and abiotic components of their environment.

8.L.3.1: Explain how factors such as food, water, shelter and space affect populations in an ecosystem.

Activities:

- ◆ **Stream Watch/Ask the Bugs!** – Students learn how plants and animals interact in their aquatic ecosystems by sampling the bugs (indoor modeling or outside leafpacks) and learning how macroinvertebrates are assessed (indoor or outdoor options).
- ◆ **Watershed Game** – Students play a game showing how different human behaviors affect the watershed through modifications to the biotic and abiotic components (indoor).
- ◆ **Macroinvertebrate Mayhem** – Students play a game of tag to simulate the effects of environmental stressors on macroinvertebrate populations (outdoor).