SENSORY EXPLORATIONS
PRE- and POST - VISIT ACTIVITIES

Your class will soon be attending the **Sensory Explorations** program at the Brooklyn Botanic Garden. We will explore plants and plant parts using four of our senses—hearing, smelling, touching, and seeing. This packet includes motivating questions and activities that will prepare your students for the experiences we look forward to providing for them during the workshop at BBG. These activities can also be done after you come to the Garden to extend your students' experience with using their senses to make authentic observations about the natural world around them.

SUGGESTED CLASSROOM ACTIVITIES

Objectives of Classroom Activities:

1. To help children identify and focus their senses
2. To discover the numerous ways that plants can be used to stimulate the senses
3. To explore plants and the parts of plants

Inquiry Starters in the Classroom: Using Our Senses

- **Color Our World**

  Materials: -various objects of different colors
  -construction paper
  -chart or Kraft paper

  Ask your students if they have a favorite color. Ask them to bring something to school to share that has that color: a ribbon, a small car OR wear an item of clothing that has that color. Sort the objects by color.

- *What are our favorite colors?*

  Create a bar graph:

  1. Cut out squares of colored paper; use a variety of colors and hues of colors.
  2. Let each child choose one square that is their favorite and write their names on the square.
  3. Using a piece of chart paper, or a length of Kraft paper if a bigger scale is needed, make the axes of a graph. Paste one square of each color along the "x" or bottom axis. Write the name of the color on its square.
  4. Have each child place their square on the graph above the square that matches their color.
  5. Label the "y" axis with the numbers 1 through 1 or 2 numbers above the tallest column on the bar graph.
  6. Which color is the favorite of the most number of children?

❁ Mystery Bags: Exploring the Sense of Touch

Materials: -paper lunch bags

-objects with different textures: soft, hard, rough, smooth, etc.

-blindfolds (optional)

Use brown paper lunch bags or any small/medium sized bag that is opaque. Place objects with different textures in the bags: soft stuffed toy; sand paper or loofa sponge – something scratchy; smooth pebbles. Have children place their hands in the bag to feel each object without looking inside OR blindfold each child before they reach into the bag.

Children can choose mystery objects for each other to explore once they are familiar with the activity.

- *How does it feel? What does it feel like?*
- *Can you think of more than one word to describe how it feels? (*Keep a "word wall" or "word bank" of the words used to describe texture.)
- *What do you think this object is?*

❁ I Know That Smell: Exploring the Sense of Smell

Materials: -small empty jars or film canisters

-cotton balls

-various extracts, scents, and oils (see below)

Aromas often evoke strong responses and memories. Choose familiar aromas for children to sample and then share what the scents remind them of or make them think of. Here are some to try:

- Vanilla extract

- Lemon extract
- Peppermint extract
- Rose-scented oil or soap
- Lavender-scented soap
- Cinnamon – ground and/or sticks
- Curry Powder

To make "scent-sors" with the liquid extracts: place a few drops of extract on a cotton ball. Place the cotton ball in a small jar or empty film canister.
To make "scent-sors" with the powders: place a half teaspoon of powder in a film canister or small jar. Punch holes in the top of the container so children can sniff without inhaling the powders.

- *What do these aromas remind you of?*
- *What smells like this?*
- *How does this scent make you feel?*

The Noise When It is Quiet: Sounds in Our Classroom

Materials: -various objects to create noise (see below)

Have students seated comfortably in the common area or at their desks. Tell them that you will ask them to close their eyes for 10 seconds. Tell them that while their eyes are closed you want them to use their sense of hearing to listen for sounds in the classroom.

- *What sounds did they hear?*
- *What was making those sounds?*

Now – make some noise. Ask students to close their eyes. See if they can identify common classroom sounds that you make while they have covered their eyes.
Tell students not to call out if they can identify the sound; ask them to raise their hands and see how many have detected the sound source.
Here are some to try:

- Open and close a book
- Rustle paper
- Sharpen a pencil
- Raise or lower the window shade

Taste Test

At BBG we will not use our sense of taste, so this activity is a good one to enjoy at school before or after your trip to the Garden.

Materials: -Various fruits and vegetables
-Cutting boards
-Plates
-Plastic knives
-Soft scarf or cloth for a blindfold (optional)

Prepare a sample plate of a variety of bite-sized snacks, with anything from green peppers and tomatoes to mangoes and lettuce. Have the students take turns tasting them while wearing a blindfold or closing their eyes and holding their noses so they can neither see nor smell what they are eating. Let them try and figure out what foods they are actually tasting. You may want to keep a chart of their guesses to see who has the best sense of taste.

- *Which foods are the easiest to identify? Which ones are the most difficult?*
- *Did other senses besides taste help to identify the food?*
- *What kinds of textures could the students feel with their tongues?*
- *How is the texture of celery different from that of a carrot?*
- *Why do we eat carrot roots but not carrot leaves? Rabbits might love to eat the carrot leaves, though!*

Using Our Senses to Explore Plants: What do we know about plants?

Materials: -Whole plants in pots – can be indoor houseplants, a 'six-pack' of young plants from a nursery. A plant or plants with roots, stems, leaves and maybe flowers.
-Fresh flowers with stems and leaves
-Whole vegetables: carrots, radishes, beets with tops
-Fresh herbs – peppermint, chives, oregano, parsley, cilantro bunches from the grocery store or green grocer
-Chart paper and markers to record student responses

Our senses enable us to describe the detailed characteristics of things in our environment. In the workshop at BBG, students will be observing a diverse collection of plants that they will be able to touch and smell. It will be helpful if they are able to learn or review what they know about plants before they come to visit the Garden.

Give students an opportunity to use their senses of sight, touch and smell to investigate the plant collections you bring to the classroom. Gently take potted plants out of their containers so children can touch, smell and look at the roots.

Record children's responses to these questions:

- *Are plants alive?*
- *What do plants need to live and grow?*
- *How do you know that a plant is growing?*
- *What are the parts of a plant?*
- *What does each part of the plant do for the whole plant?*

Compare plants to people.

- *What do people need to live and grow?*
- *What are our body parts? What does each one of them do?*
- *How do we know that we are growing?*

It is fine if students' answers reflect an introductory familiarity with plants, their parts and their growth requirements. We will talk about plant parts and growth requirements during the classroom lesson at BBG and then give students an opportunity as they explore our plant collection to review this understanding with a variety of plants.

Using Our Senses Outside: Short Field Trips to Collect Sensory Observations

Materials: -Nature Journals (see below)
-pencils/colored pencils/crayons

Choose an area on your school grounds or near your school that is large enough for the whole class to stand or sit with at least 2 arms' lengths between children and enclosed so that they will not be in the way of others. A school yard with some grass, trees or even a patch of soil is good; a park nearby is even better. But if your school has only "hardscape": sidewalk, pavement, steps around it, children will still have sensory stimuli to collect. What is growing in the cracks between the squares of pavement?

1. Make ***Nature in the City Journals*** to record children's sensory observations

★ collectively on chart paper or in a "big book"; a spiral-bound flip chart can become a big book or you can purchase a large blank big book from educational supply companies

OR

★ individually in notebooks or handmade journals. A sample format page is included in this packet.

2. **Visit the same area once a week or once every two weeks** through two or more seasons of the year. Visit on a rainy day if possible once and awhile, or if it is snowing.

Here are a few ways/suggested prompts to initiate sensory observations:

- **Listening:**

  Close your eyes. Stand (or sit) still. Listen for a few moments.

  What sounds do you hear...made by people?
  ...made by cars, trucks or machines?
  ...made by animals?
  ...made by water?
  ...made by plants?
  Can you hear a sound better if you stay in one place?
  Does it change if you move around?
  What is the noisiest place in school?
  What is the noisiest place you know outside of school?
  What sounds does the city make?

- **Feeling:**

  Stand in a sunny place. Close your eyes. *Can you feel the sun on your face?*
  Hold your hands palms up in front of your body, as if you were carrying a tray. *Do your palms feel the sun? How does it feel?*
  Stand in a shady place. Close your eyes. *How does your face feel now?*
  Hold out your palms again. *How do they feel?*
  Is there any wind? How does the air feel on your face?
  Is the air wet or dry? How can you tell?
  Where did you find a sunny place? Where did you find a shady place?
  Which place feels more comfortable to stand in today?

- **Feeling With Your Feet**:

  Walk on the sidewalk or the playground. Walk on the grass or where there is no hard sidewalk.

  What noises do your feet make when you walk on the sidewalk?
  What noises do your feet make when you walk on the grass?
  How do we write the words for sounds?
  How does walking on something hard feel compared to walking on something soft?

- **Take a Picture**:

  Make a “picture frame” using oak tag or manila file folders or cardstock or cardboard for each child. The frame can be 5” by 7” or 4” by 6” on the outer margin; leave about

an inch of frame all around and cut out the center rectangle. Children can keep their frames in their journals. A template to make frames is included (page 9 of this document)

Hold the frame a short distance from your face. Frame a “view” of the street, or school yard or park – that is the picture you are taking!

What is the largest object in your picture?
What is the smallest?
Is anything moving through your picture?
What colors are the objects in your picture? What shapes?

Draw the picture you see in the frame or record your sensory observations after the ‘prompts’ on the cut-out rectangle that came from the center when you cut out your picture frame.

Nature In The City Journal

Today is _____ The season is _____

The weather conditions today (circle all that apply):

Sunny	Bright	Cloudy	Blue sky	Some clouds
Cold air	Warm air	Hot air	Dry air	Moist/Humid air
Rain	Snow	Cold wind	Warm/hot wind	
Cool breeze	Warm breeze		Icy	Slushy

Place I Came Today: _____

Sounds I hear today are:

_____ _____

_____ _____

Today I feel

_____

_____

_____

Today's Picture:

Something I observed for the first time today is

_____

_____

Something that was the same as the last time I observed is

_____

_____

In the Garden

I see

I hear

I smell

I feel

Cut along the dotted lines to make the viewing frame;
Paste the inside in your journal to record your observations.

Resources for Outdoor Expeditions and Nature Journals

Journey North: A Global Study of Wildlife Migration and Seasonal Change

http://journeynorth.org/

Students will develop the skills of natural scientists and can record their observations of the changes in plants, animals and weather that they make on this interactive website. Excellent teacher and student resources for all grade levels.

Celebrate Urban Birds: Cornell Lab of Ortnithology

http://www.birds.cornell.edu/celebration

Cornell enlists the help of citizen scientists in keeping track of the populations of birds that live in and migrate through our cities in New York State. Resources appropriate for all grade levels guide students in learning how to identify birds, understand their behaviors, track their migration and record the data on the website.

First Hand Learning

http://firsthandlearning.org/

Look for the "Things To Try" section of this website. A mini-journal activity and a "cracks and crevices" inquiry can get your students started on examining what is happening in the school yard and on the sidewalks around your school.

Claude Monet: Artist and Gardener

Claude Monet was an artist who lived in France who loved to paint outdoors and loved plants. He had a house in the country in a town called Giverny where he created a garden with lots of flowers, plants for his family to eat, and a pond in which he grew beautiful water lilies. He even built a Japanese-style bridge over the pond. Claude Monet painted many wonderful pictures of his garden and pond and the plants that grew there.

- Visit Giverny on the Web at www.giverny.org to view photographs of the garden as it looks today and Monet's art created in the garden.
- Read

  A Blue Butterfly: A Story About Claude Monet by Bijou Le Tord
  New York: Doubleday Book for Young Readers/Delacorte Press, 1995

- *What would the garden of your dreams look like?*
- Children can create pictures, plans, and written descriptions of the gardens of their dreams, as Monet did, before he was able to plant one with real plants. They can draw or paint their own illustrations and/or collage photos and pictures cut and collected from seed catalogues and magazines.

Books about creating gardens in the city:

The Gardener by Sarah Stewart, pictures by David Small
New York: Farrar, Straus, Giroux, 1997

Flower Garden by Eve Bunting, illustrated by Kathryn Hewitt
San Diego: Harcourt Brace and Company, 1994

The Garden of Happiness by Erika Tamar, illustrated by Barbara Lambase
San Diego: Harcourt Brace and Company, 1996

Make Tea

Materials:

- Peppermint tea (loose and in bulk, or any kind of tea made from leaves)
- Tea bags
- Tea tags
- Spoons
- Containers for loose tea
  OR a variety of herbal tea bags, some to use for brewing tea and some to open so students can examine what the tea is made of

Put out the loose tea in containers for students to see and smell (but don't touch yet, since they'll be drinking the tea!). Alternatively, open several different herbal tea bags so students can touch, look at and smell the bag contents.

Ask these questions:

- *What colors do you see?*
- *What does the tea smell like?*
- *What do you think the tea will taste like?*
- *Which part of the plant do you think this tea came from? Why?*

Have students put about two spoonfuls of the loose tea into tea bags. Fold the tea bag and staple the tea tag on. Students can take tea bags home or you can have a tea party in the classroom!

Sources of loose tea and tea bags:

Stash Tea Company www.stashtea.com

Frontier Natural Products Coop www.frontiercoop.com

Porto Rico Importing Company 201 Bleeker Street, New York, New York; 212-477-5421
www.portorico.com

Books to Read

Here are some great books to read with your class to engage their senses in nature:

The Reason for a Flower by Ruth Heller. New York: Grosset and Dunlap, 1983
Describes the cycle of flower to seed, including the many insects and animals involved. Wonderful, vivid illustrations.

The Other Way to Listen by Bird Baylor and Peter Parnall.
New York: Aladdin Paperbacks/Simon and Schuster Children's Publishing Division, 1997
A story about how a child learns to "listen" to rocks, trees, and animals from a wise older man.

Eating the Alphabet: Fruits and Vegetables from A to Z by Lois Ehlert.
San Diego: Voyager Books/Harcourt Brace and Company, 1989
"Apple to Zucchini, come take a look. Start eating your way through this alphabet book."

Sky Tree: Seeing Science Through Art by Thomas Locker.
New York: Harper Collins, Publishers, 1995
Beautiful illustrations follow a tree through the seasons of a year. Questions posed on each page invite student response and reflection.

Red Leaf, Yellow Leaf by Lois Ehlert.
San Diego: Harcourt Brace and Company, 1991
Leaf Man by Lois Ehlert.
San Diego: Harcourt, Incorporated, 2005
Real leaves of many kinds form the basis of Ms. Ehlert's collaged illustrations in both of these books. A wonderful way to introduce the diversity of trees and their leaves and celebrate the seasonal colors that indicate that a change in the time of year has come.

"Just the Facts" About Plants

Here are some fundamental facts about plants for you to have at your fingertips. We suggest you use this background information to enhance your own understanding and guide students' understanding.

1. What do plants need to grow? Plants require carbon dioxide and oxygen from the air, varying amounts of light, water, and warmth to live. They need space to grow and minerals for healthy growth and structure.

2. Photosynthesis - is the process by which green plants can make their own food. "Photo" means "light," and "synthesis" means "to place together." During photosynthesis, carbon dioxide (CO_2) and water are brought together chemically to form food in the form of sugars (carbohydrates) for the plant, and oxygen. The energy source for this process is light energy from the sun. The green pigment chlorophyll traps the light energy from the sun that is used for this process. All of the green parts of plants are able to make sugars. The

oxygen given off by plants as a result of photosynthesis sustains most living things on Earth. Green plants are the only multicellular organisms that can make their own food.

3. Plant Parts – A typical plant consists of six major parts:

   ROOT: absorbs water and minerals, anchors the plant, stores food and water
   STEM: transports sugars, water and minerals to the various plant parts, serves as support for other plant parts including leaves, flowers and fruits
   LEAF: usually has the most surface area for photosynthesis and has pores (stomata) through which gases can be exchanged with the air
   FLOWER: contains the reproductive organs of the plant that give rise to the seeds; part of the flower becomes the fruit
   FRUIT: contains the seeds and is a vehicle for seed dispersal
   SEED: contains the embryo (baby) plant and usually a food supply to support the early growth of the seedling.

4. Fruit or Vegetable? Can you think of what beans, walnuts, tomatoes, apples, cucumbers, milkweed pods all have in common? If you said that they are all the part of the plant which holds the seeds you were correct. Most people agree that apples, oranges, pineapples and mangoes are fruits but you will spark a lively discussion when you suggest that pumpkins, tomatoes and peppers are also fruits. Botanists, the scientists that study plants, define *the* ***fruit*** *as the part of the plant that holds and disperses the seeds.* Therefore pumpkins, tomatoes, peppers, cucumbers, and string beans are all fruits. Botanically, a ***vegetable*** is a *root, stem or leaf* that we eat. However, horticulturists and farmers often used a broader definition of a *vegetable* to be *any edible part of a plant*. They would therefore say that a fruit can also be called a vegetable.

5. Are all Fruits or Seeds Edible? The purpose of the fruit is to disperse the seeds to locations at some distance from the parent plant. Why? If a plant's seeds all germinated right under them the seedlings and the parent would be competing for survival. If the seeds can be dispersed far and wide there will be a greater chance that seedlings will grow into mature plants. The range of the plant's species will increase.

   Sweet, juicy fruits are produced by plants specifically to lure animals to eat them, swallow the seeds and 'poop' them out or discard them somewhere farther away from the parent plant. Not all fruits are sweet and juicy, however! Some fruits and/or seeds are designed to "fly", some are designed to "float", and some are designed to "hitchhike" on the fur or feathers of animals.