Activity Ideas:
Plants

Supplementary Resource for Video 5: Educator Strategies for a Playful Classroom
This document is a companion guide to the Ontario Science Centre’s video series on Play Based Learning, produced in partnership with the Ontario Ministry of Education.

To see the learning opportunities in action, look for the videos on the Science Centre’s YouTube channel: https://www.youtube.com/user/OntarioScienceCentre

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LEARNING OPPORTUNITY:
PLANT SKETCHING

What it’s about:
- Often, we associate research with books or the internet, but research can also mean direct observation.
- Students use sketching as a tool for close observation, drawing objects scattered on a mirror.

Connections/Extensions:
- Look at other links between sketching and scientific observation (e.g. scientific illustration, Leonardo da Vinci’s sketches, etc.)
- Geometry connections: learning to draw by finding basic shapes within objects
- Drawing exercises: gesture drawing, contour drawing, reproducing an image with the grid method

Try it outside:
- Draw the same tree (or other object) each day or week for a period of time. How does it change?
- Sketch different cloud types on different days. What do the trends tell you about the weather?
- Trace a shadow. How quickly does it change?
- Find unusual colours in the natural and built environment: bring a variety of paint swatches outside, and find a match for each colour. You might be surprised by how many colours you find!
- Research *plein air* (outdoor) painting, and try it yourself! What are the advantages and the challenges?
- Challenge students to find and sketch an object that meets a certain criteria (e.g. something red, something tiny, a seed, something man-made, etc.).
Materials:

- Drawing materials (we used watercolour pencils/crayons with brushes and water)
- Paper (we used watercolour sheets cut in half)
- Placemats to mark individual spots (optional)
- Mirror to arrange objects
- Natural objects (The photo below shows the basic setup. We filled the mirror with many more objects when doing the activity with students. We used twigs in a clear glass, interesting branches, pine cones, cotton bolls, teasel heads, sea shells, etc.)

Observations from Prototyping:

- The arrangement of objects on the mirror made ordinary things look very special.
- Objects contained within glass produced interesting reflections in the mirror.
- It would be interesting to ask students to bring in special objects to draw.
- Some students tried to sketch the objects, others drew their own pictures (we were okay with that).
- We invested a bit of money to give students the opportunity to use good-quality art materials, and we felt it made the activity richer. That being said, it would be fun and enjoyable with inexpensive materials also.
- We discussed with students that the paper was special, so they should use one sheet per person, and they obliged.

See next page for sample instructions/prompts (we placed it in a T-stand)
Plant Sketching

Important notes:

✓ Watercolour paper is very special, so use only one piece.
✓ When you are finished with your sketch, put out a fresh sheet of paper for the next person to use.
✓ Don’t forget to tidy your station when you’re finished.

Things to notice and try:

Look carefully at the objects on the mirror. What colours do you see?

Draw on your paper with a pencil or crayon. What happens if you brush a little water over top of the line you made?
LEARNING OPPORTUNITY:
PAINTING WITH PLANTS

What it’s about:
• Students explore materials and textures by applying paint with non-traditional materials.
• White wax candles are also provided to create areas that resist water-based paints.

Connections/Extensions:
• Printmaking with cut fruits or potatoes
• Fish prints
• Opportunities to research and study abstract art
• Make natural pigments with pureed beets, turmeric, mustard powder, arrowroot, berries, red cabbage, etc.
• Research cave painting. What materials did ancient artists use, and what did they paint?

Try it outside:
• This has potential for mess, so would be fun to try outdoors with huge sheets of craft paper.
• In the winter, students could paint (with water-based non-toxic pigments) the snow with evergreen branches or interesting twigs.
• Splatter painting outdoors with natural (or non-toxic) pigments.
Materials:

- Mats to protect table and mark individual spots
- Paper (we used watercolour sheets cut in half)
- Bowls with natural materials for painting: pine cones, a variety of evergreen branches, interesting twigs, etc. We added more materials than what is shown below.
- Tins of paint (we used diluted watercolour or acrylic paint)
- Containers of water for rinsing
- White candles broken in half (crayons would also work)

Observations from Prototyping:

- Students were more inclined to use paint brushes, when that was provided as an option (it’s up to you to decide if that matters).
- Grade 3 students worked with minimal supervision. We used only two colours of paint that would still look nice if mixed together, anticipating that they would mix. Students were surprisingly diligent about rinsing brushes before switching colours.
- Someone suggested taking a crayon rubbing of a natural object, and then applying a wash of paint on top. This would be an interesting idea to explore further.

See next page for sample instructions/prompts (we placed it in a T-stand)
Painting with Plants

**Important notes:**

✓ Watercolour paper is very special, so use only one piece.
✓ When you are finished with your sketch, put out a fresh sheet of paper for the next person to use.
✓ Don’t forget to tidy your station when you’re finished.

**Things to notice and try:**

Draw on the paper with the white waxy candle.

What happens when you add paint on top of the lines you’ve made?

Try adding paint using the plant parts in the bowl. How many different kinds of lines can you make?
LEARNING OPPORTUNITY:
SEED MOSAIC

What it’s about:
- Students explore collage and patterning by arranging dried legumes on a mirror.

Connections/Extensions:
- Take pictures of completed mosaics and display them in a special place.
- This can be transformed into a take-home art activity, by gluing legumes onto black bristol board, instead of arranging them on a mirror. Choose smaller legumes (e.g. split peas, soup mix) that will stick easily.
- Explore mosaics in architecture
- Mathematics connections (patterning and algebra): creating, identifying, and extending patterns
- Mathematics connections (geometry): shapes, symmetry

Try it outside:
- Find and photograph different examples of tile mosaic in your neighbourhood (in Toronto, subway tile is a good example).
- Purchase a bag of mixed birdseed, and make an edible mosaic outdoors.
- Look for examples of radial and bilateral symmetry outdoors in the natural and built environment.
- Research Andy Goldsworthy, an artist who makes beautiful temporary outdoor artworks using natural found materials. Try something similar!
**Materials:**
- Mixed raw legumes (we used chick peas, white navy beans, black beans, kidney beans, yellow and green split peas) in containers
- Large mirrors for arranging legumes

**Observations from Prototyping:**
- We were concerned that students would try to eat the legumes, but we didn’t find it to be an issue.
- We used angled mirrors, because that’s what we had on hand. Students figured out pretty quickly that the mirrors could be lifted off the table and used to explore rotational symmetry (see the photos on the first page).

See next pages for sample instructions/prompts (we placed them in a T-stand)
Seed Mosaic

Safety notes:
✓ Never eat your science experiments
✓ Tidy your spot when you finish, so the next person can have fun.

Use the seeds to make a pattern on the mirror.

If you want to save your design, ask your teacher to take a picture of it!

Don’t forget to put the seeds back when you’re done.
LEARNING OPPORTUNITY: PLANT OBSERVATION AREA

What it’s about:
• Students are provided with plant specimens, observation tools (magnifying glass, smartphone microscope) and post-it notes for recording questions.

Connections/Extensions:
• Plant anatomy
• Edible plants
• Plant germination experiments (e.g. look online for garden in a glove, sprouting seeds in CD cases)
• Try growing sprouts from legumes, or from herb plants that have gone to seed.
• Sketch a plant as it grows.
• Germinate seeds in empty eggshells.
• Create terraria with pebbles, air plants, twigs, tiny toy animals.
• Fungus exploration: DIY edible mushroom kit (something that can be done in the dark), can be purchased online or at some hardware stores.

Try it outside:
• Collect plant parts to try and sprout indoors.
• Learn to identify city trees (there is a surprisingly small number of species).
• Observe tree buds in winter, after leaves have fallen.
• Find leaves outside and sort by category (students decide on the categories).
• Research how to force buds to bloom, and experiment with twigs in early spring.
http://www.marthastewart.com/913198/forcing-buds-bloom-early
Materials:
- Writing materials
- Post-it notes
- Mould terraria [https://www.exploratorium.edu/science_explorer/mold.html](https://www.exploratorium.edu/science_explorer/mold.html)
- Interesting plants (hyacinth bulbs and buds, marimo balls, cacti, etc.)
- Experiments in regrowing vegetable scraps. We used:
  * Celery
  * Carrot
  * Radish
  * Avocado
  * Garlic
  * Green onion

Observations from Prototyping:
- We created the mould terraria and veggie sprouting experiments ourselves (because of time constraints), but the experiment would be even more compelling if the experiments were set up by the students, as part of a longer term project.

See next pages for sample instructions/prompts (we placed them in a T-stand)
Plants to Observe

**Mould terraria:**
Look at the glass jars with the food scraps inside. What do you notice?

Can you see any water on the sides of the jar? Where do you think it came from?

**Vegetable Scraps:**
Look carefully at the vegetable and fruit scraps growing in water. Can you see new roots on any of them?
LEARNING OPPORTUNITY: NATURE BOX

What it’s about:
- A tackle box is filled with a variety of seasonally rotating plant parts (e.g. stems, twigs, roots, seeds, etc.). Students are provided with magnifying glasses for close examination.

Connections/Extensions:
- Students can help gather material for the boxes. In an average classroom, if each person brings one object, it should fill nearly all of the spots in the box.
- For students studying plants, a variety of plant parts will provide good connections to plant anatomy and structure (identifying different kinds of buds, seeds, leaves, etc.). Learn about how to use a key or field guide to identify different families or species of plants.

Try it outside:
- Bring magnifying glasses (or for older participants, a botanist’s hand lens) outside to observe nature up close.
- On an outdoor excursion, students could gather materials (discuss guidelines beforehand) to populate the box. It would be interesting to see if different types of habitats (e.g. park vs schoolyard vs meadow) produce different varieties of materials. Some interesting connections to biodiversity could be made here.
- Street tree study: gather different materials (leaves, seeds, twigs, buds) from urban trees. Use books or the internet to identify specimens. How many species can students find?
Materials:

- Tackle box
- Magnifying glasses + black felt cloth for specimens to be placed on
- Interesting materials gathered from outdoors (e.g. in spring, we found goldenrod galls, evergreen needles and cones, a variety of twigs and buds, rose hips, burrs, pussywillows, milkweed husks, black locust seed pods, fuzzy sumac twigs, alder cones, a wasp nest, etc.)

Observations from Prototyping:

- It was surprisingly easy to find enough specimens to populate the box. We gathered all the materials on a short walk through the Don Valley, and the variety of colour and texture was very attractive.
- Burrs tended to stick to the black felt, making it challenging to re-use.
- Fluffy seeds can easily spread around the classroom. We enclosed ours in small plastic containers, found in the craft section of the dollar store.

See next pages for sample instructions/prompts (we placed them in a T-stand)
Nature Box

Use the magnifying glass to study the objects.

Can you find…

✓ A seed that travels in the wind
✓ A seed that an animal might eat
✓ Something prickly
✓ Something fuzzy
✓ A bud from a tree
✓ A home for an insect
✓ A leaf that stays green in the winter
✓ 3 types of seeds
✓ 2 types of leaves
✓ Something that reminds you of springtime