

CURRICULUM CONNECTIONS

INTEGRATING
THE BONDAR CHALLENGE
INTO YOUR CURRICULUM

This resource was developed by The Roberta Bondar Foundation

©The Roberta Bondar Foundation



CURRICULUM CONNECTIONS

The School Bondar Challenge can be integrated into the curriculum in many ways. The program is most suited to complement the Science, Visual Arts and Language curriculums, but connections can be made to other subjects, such as Social Studies and Math. The Bondar Challenge is suited to facilitate cross-curricular and integrated learning. The hands-on aspect of the program is also a great way to incorporate experiential and inquiry-based learning into your teaching.

The following pages provide some examples of ways to integrate the Bondar Challenge into these curriculums. The lessons have been designed to align with the Ontario curriculums.

We encourage you to be creative in the approaches you take to deliver the Bondar Challenge. The lesson plans we have outlined are simply to provide some starting points and can easily be modified and adapted to suit the needs of your students.



SCIENCE

The following tables outline how the Bondar Challenge can be connected to the Elementary and Secondary Ontario Science Curriculums. Each curriculum is linked in the titles. The activities on pages 4 & 5 provide examples of how photography can be integrated into your lesson plans to help meet specific curriculum expectations.

Ontario Elementary Curriculum

Grade	Life Systems	Earth and Space Systems	Specific Curriculum Expectations
1	Needs and Characteristics of Living Things		2.1, 2.3, 2.4, 2.6, 2.7 3.2, 3.4, 3.5, 3.6, 3.7
1		Daily and Seasonal Changes	2.1, 2.2, 2.3, 2.4, 2.5, 2.6 3.1, 3.4, 3.5
2	Growth and Changes in Animals		2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8 3.1, 3.2
2		Air and Water in the Environment	2.1, 2.3, 2.5, 2.6, 2.7 3.2, 3.3, 3.4, 3.5
3	Growth and Changes in Plants		2.1, 2.2, 2.4, 2.5, 2.6, 2.7 3.3, 3.4, 3.6, 3.8
3		Soils in the Environment	2.1, 2.2, 2.3, 2.5, 2.6 3.1, 3.3, 3.4
4	Habitats and Communities		1.1, 1.2 2.1, 2.3, 2.4, 2.5, 2.6 3.1, 3.2, 3.3, 3.4, 3.7, 3.8, 3.9, 3.10
4		Rocks and Minerals	2.1, 2.3, 2.4, 2.5, 2.6 3.2, 3.4
5		Conservation of Energy and Resources	1.1 2.2, 2.5 3.2
6	Biodiversity		2.1, 2.2, 2.3, 2.4, 2.5 3.1, 3.2, 3.3, 3.4, 3.5, 3.7
7	Interactions in the Environment		2.1, 2.3, 2.4, 2.5 3.1, 3.2, 3.3, 3.6, 3.7, 3.8
8		Water Systems	2.4, 2.6, 2.8 3.1, 3.2, 3.3, 3.4, 3.5

SCIENCE

Ontario Secondary Curriculum (Grade 9 and 10)

Grade	Biology	Earth and Space Systems
Grade 9 Academic	Sustainable Ecosystems	
Grade 9 Applied	Sustainable Ecosystems & Human Activity	
Grade 10 Academic		Climate Change
Grade 10 Applied		Earth's Dynamic Climate

Ontario Secondary Curriculum (Grade 11 and 12)

Grade 11 Biology - (U)	Diversity of Living Things
Grade 11 Biology - (U)	Plants: Anatomy, Growth, and Function
Grade 11 Biology - (C)	Plants in the Natural Environment
Grade 11 Environmental Science - (C/U)	Scientific Solutions to Contemporary Environmental Challenges
Grade 11 Environmental Science - (Workplace)	Human Impact on the Environment
Grade 12 Biology - (U)	Population Dynamics
Grade 12 Earth and Space Science - (U)	Earth Materials

LESSON PLANS

Grade 1: Seasonal and Daily Changes

- To learn about seasonal changes, take pictures of the same area (school yard, nearby park, etc.) during each season. Use these photos to describe and compare the four seasons.
- To investigate daily changes, take pictures in the same spot in the morning and afternoon and compare. How have the lighting and the shadows changed?

Grade 2: Water in the Environment

- To investigate water in the environment, use photography to observe and record water in your local area (e.g. precipitation, cloud formation, puddles, streams). Where does the water come from? Where does it go? Use these pictures create a diagram of your local water cycle.

Grade 3: Growth and Changes in Plants

- To learn about growth and changes in plants take pictures of plants throughout their life cycle or throughout the seasons. Examples of things to photograph include: buds, flowers, berries, seed pods, colourful leaves in the fall, branch silhouettes in the winter. Use these pictures to describe the changes that plants undergo in their life cycles.



LESSON PLANS

Grade 4: Habitats and Communities

- Use photography to document and analyze the positive and negative impacts of human interactions with natural habitats, and evaluate ways of minimizing the negative impacts.
- To learn about communities, take pictures of 10 species that form a community near you. Use these pictures to construct a food web and discuss how these species interact with one another

Grade 5: Conservation of Energy and Resources

- Use photography to analyze some of the environmental impacts of human uses of energy and natural resources. What are some impacts on animal and plant communities? On water systems? Gather photographic evidence of these impacts in your local environment and discuss ways to reduce these impacts.

Grade 6: Biodiversity

- To learn about biodiversity, photograph and identify as many plant and animal species as possible in your local environment. To help with the identification, consider using the [Seek app by iNaturalist](#). To go one step further, classify these species as native or non-native. You can also start a species count for your class and update it throughout the year.



VISUAL ARTS

The photography component of the Bondar Challenge relates directly to the Fundamental Concepts outlined in the Ontario Arts Curriculum. These concepts consist of elements and principles in Visual Arts as outlined below:

Elements of Design

- Line
- Shape and form
- Space
- Colour
- Texture
- Value

Principles of Design

- Contrast
- Repetition and Rhythm
- Variety
- Emphasis
- Proportion
- Balance
- Unity and Harmony
- Movement

Photography can be an effective way of teaching these elements and principles. Refer to the EcoSeek Camera Tip deck and the lesson plan examples below for ideas on how to relate these concepts to photography.

Grade 2: Repetition and Rhythm

- While taking pictures, focus on photographing repeating shapes and colours in the environment. How does the repetition of these elements enhance interest in a photo?

Grade 6: Balance

- An image can have symmetrical balance or asymmetry. To learn about balance in photography, focus on applying the rule of thirds while composing your photos.

Grade 8: Movement

- Leading lines create movement by carrying the viewer's eye into a photograph. While taking pictures, look for different patterns of leading lines such as curves, colours and textures.

SOCIAL STUDIES

One of the fundamental goals of the Ontario Social Studies curriculum is developing an understanding of interrelationships within and between the natural environment and human communities. The Bondar Challenge is well suited to help students work towards this goal and develop the knowledge, skills and attributes of environmentally responsible citizens.

The Bondar Challenge can be integrated into the [People and Environments strand in the Grades 1-6 Social Studies curriculum](#), where students investigate contemporary environmental issues and develop plans of action to promote stewardship.

LANGUAGE

The Bondar Challenge can also be integrated into your language curriculum with the artist statement that accompanies each photo submission. As an alternative to completing the GEM cards we provide for you, students can write their own artist statements explaining the goal of their photograph, why it is important to them and its connection to science. This statement is an effective way of practicing persuasive writing for students of all ages.

ENVIRONMENTAL EDUCATION

One effective way to integrate the School Bondar Challenge into the Environmental Education curriculum is by using photography to learn about urban ecology and explore the impact of human activity on the environment. While exploring your local environment, identify assets and deficits and take photographic evidence of your findings.

- Assets include native species (e.g. pollinators), biodiversity, urban tree canopy, conservation initiatives and protected areas, etc.
- Deficits include invasive species, plastic on the ground and in water systems, impermeable surfaces, polluted water, etc.

Assets and deficits can also be framed as treasures and troubles.

Learning about human impacts on the environment will make students aware of environmental issues, which may spark student action and ultimately drive change in your school community and beyond.

EXPLORATION → AWARENESS → ACTION → CHANGE

Student led environmental action may include:

- Recycling and composting initiatives in your school
- Community clean-up initiatives
- Tree planting at a local park
- Planting a pollinator garden in your school yard
- Biking or walking to school
- Packing litterless or plastic-free lunches and using refillable water bottles

STEAM LEARNING WITH THE BONDAR CHALLENGE

