

GRADE 3

Biodiversity

MAKERSPACE

CREATURE



CHALLENGE

A COMPREHENSIVE LESSON PLAN

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The new BC Curriculum reflects a shift towards a concept-based, competency-driven curriculum. The new curriculum is less prescriptive than before, allowing educators to be creative and innovative in their design of learning experiences, offering flexibility and choice for teachers and students.

The new curriculum promotes higher-order thinking and deeper learning centred on the 'Big Ideas' in each discipline. Core competencies related to Thinking, Communication, and Personal and Social Responsibility are explicit, and First Peoples' Principles of Learning are integrated throughout.

This resource is a comprehensive lesson plan designed to address the learning standards and core competencies outlined in the new BC Curriculum for Grade 3 Arts and Science. It was developed by Open School BC, in partnership with the Ministry of Education's provincial Curriculum/Assessment team and BC teachers.

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Contributors

Leanne Baugh
Monique Brewer
Paul Britton
Angie Calleberg
Valerie Collins
Sean Cunniam
Kate Foreman
Edward Gomboc
Pat Horstead
Andrea McEwen
Farrah Patterson
Jennifer Riddel
Meredith Rusk
Chris Teskey
Nancy Walt

Photographs provided by Andrea McEwen – Educator, University Hill Elementary School

BIG IDEAS

Science 3

Living things are diverse, can be grouped and interact with their ecosystem.



Arts Education 3

Creative experiences involve interplay between exploration, inquiry and purposeful choice.

RATIONALE

Why a Makerspace?

Makerspaces embody constructionist learning and approaches that integrate making and tinkering seamlessly into the classroom-learning environment. Makerspaces incorporate thinking, inquiry, making and hands-on experiential learning through active engagement within small groups. When the purpose of a Makerspace is explicit, and the design is well structured, students have opportunities to develop their critical thinking, problem solving and communication skills through iterative cycles of design. Students come to know that Arts Education/Design and Science share a common process that involves the development and testing of hypotheses through direct investigation.



Makerspaces have the potential to activate all three learning domains (cognitive, affective and psychomotor) with an emphasis on hands-on doing. The Maker Movement overlaps the natural curiosity of students with the power of learning by doing. Learners develop core competencies through the building of new knowledge (thinking), sharing of ideas (communication) and collaborative group process (personal & social). Students also develop the core skills needed to participate in more sophisticated project-based learning later on.

First Peoples' Perspectives

First Peoples' perspectives demonstrate the interconnectedness between people and their environment. Students make meaning of their natural environment and the connections in the living world while developing an understanding of place.

The Principle of Learning is a natural connection with this topic. With the use of stories, we are able to learn from the First Peoples' perspective about our environment.

PRIOR LEARNING

(K=Know, D=Do, U=Understand)

The following knowledge and understanding should be established prior to starting the lesson/activity:

The students need to understand that an animal lives in its natural habitat: its surroundings help it live, eat, grow and survive.

1. What is an ecosystem? What types of living things exist in your local environment? (K)
2. Review the various kinds of habitats that exist in the local environment and the world. (K)
3. Biodiversity is the variety of life on Earth and is an important characteristic of a habitat or ecosystem. (K)
4. Working collaboratively in groups. (D)
5. An understanding of safety and rules. (U/D)

Teachers need to provide some front-loading to activate the prior knowledge or give the students an opportunity to develop the expected understanding. Some teachers may need the review as well.

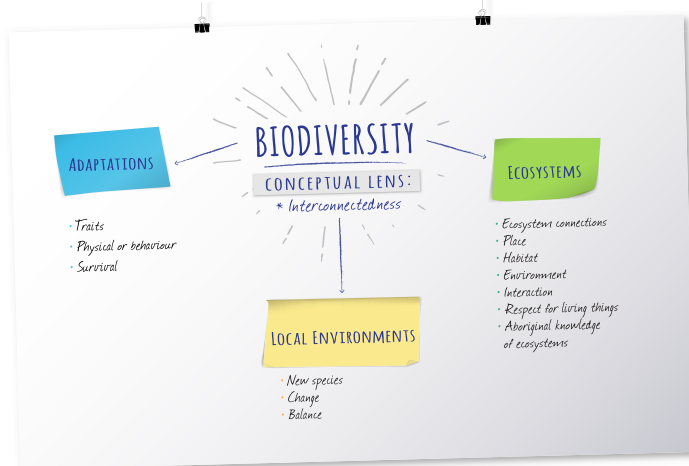
POSSIBLE ENTRY POINTS

A concept map (see example below, [larger version](#) at the end of this document) was developed as a reference for teachers around biodiversity in order to identify possible entry points for learners.

Some possible entry points include:

- ☆ Explore the terms 'ecosystem' and 'biodiversity' with the students.
 - View and discuss a YouTube video that reviews the components of an ecosystem and the variety of different types of living things that exist in the ecosystem.
 - Have students explore and discover the terms through a variety of books.

This could be an exercise just for teachers or as part of the prior learning for teachers and students to co-create.



- ☆ Understand connection between living and non-living things in the local environment shared through an indigenous or First Peoples' story.
- ☆ Visit your local environment—make predictions based on the natural world—make personal connections.

CURRICULAR CONNECTIONS

Arts Education 3

Big Idea

- ☆ Creative experiences involve interplay between exploration, inquiry and purposeful choice.

Curricular Competencies

- ☆ Create artistic works collaboratively and as an individual, using ideas inspired by imagination, inquiry, experimentation, and purposeful play.

Content

- ☆ Processes, materials, technologies, tools, and techniques to support arts activities.
- ☆ Symbolism as ways of creating and representing meaning.
- ☆ Personal and collective responsibility associated with creating, experiencing, or sharing in a safe learning environment.

Science 3

Big Idea

- ☆ Living things are diverse, can be grouped and interact in their ecosystems.

Curricular Competencies

- ☆ Demonstrate a curiosity about the natural world.
- ☆ Make observations about living and non-living things in the local environment.
- ☆ Make predictions based on prior knowledge.
- ☆ Represent and communicate ideas and findings in a variety of ways—such as diagrams and simple reports—using digital technologies as appropriate.

Content

- ☆ Biodiversity in the local environment.
 - Biodiversity: the variety of different types of living things in an ecosystem.
 - Characteristics of local plants, animals and fungi.



Learning Goals

- Create a 3D model of a 'new species' using various processes, materials, and tools.
- Use of symbolism to create a visual representation of a 'new species' in a local habitat.
- Collaboratively creating a 'new species' with a partner.



Some teachers struggle with Curricular Competencies and Content when it comes to assessment. Try combining them to create learning goals that will guide your assessment. Here are some examples of how this could look.



Learning Goals

- Demonstrate a curiosity about the biodiversity in our local environment.
- Make observations on how animal characteristics help them survive in the local ecosystem.
- Make predictions about how animals might survive in different habitats.
- Represent and communicate about the connection between an animal's characteristics and its survival in a specific habitat.



TIPS FOR TEACHERS – Things to consider

Think about the attributes, qualities and specific things you hope to see students demonstrating.

What evidence will you look for to show that students have gained an understanding of the concepts and demonstrated the processes and skills that you describe in your learning objectives?

What specific aspects of the Core Competencies are your students developing, and how?

LESSON/ACTIVITY

1. Bringing it in

Begin by reading a story about animals in your local habitat. A suggested approach would be sharing a First Peoples' story involving animals in your local environment (e.g., Salmon Forest by David Suzuki and Sarah Ellis).

This book is about a father and his daughter walking through a Pacific Rainforest; it explains the life cycle of the salmon and how all the components of the ecosystem are connected.

Activate Prior Knowledge – Guided Discussion

Initiate a guided discussion about the story. Ask:

- ☆ Where does the story take place?
- ☆ How would you describe the habitat?
- ☆ How are the animals and plants connected?
- ☆ What other kinds of habitats exist in the world?
- ☆ Have students share with a partner—what are our local habitats?
- ☆ What animals have you observed living in these habitats?

ASSESSMENT

What do you know about our local habitat and the animals that live in it?

What are you curious about?

How does the habitat in the book compare to our local habitat?

How would you describe the biodiversity of our local habitat?

With assessment questions, we want to promote more critical thinking rather than just recalling the facts.

CURRICULAR CONNECTIONS



Demonstrate a curiosity about the biodiversity in our local environment.

Make observations on how animal characteristics help them survive in the local ecosystem.



Go outside as a class to see where animals might live in their local environment. Take photographs of the various habitats in their local environment. Discuss the observations and predictions about the animals that could survive in the local habitat.

Make predictions about how animals survive in different habitats.

Suggestions:

Reflect and share the discoveries about the students' observations and predictions. Record the various habitats identified by the exploration of the local environment. As a whole group, decide on four to six local habitats for the project.

Do you live in an ecosystem that doesn't have three different kinds of habitats? This could be a potential discussion point with your class about some areas in BC that have few ecosystems.

After going outside, ask students to identify the habitats they observed.

Predict which animals would survive in these natural habitats (e.g., allow it to live, eat, grow and survive). Explain.

What other animals do you predict could live in our local habitats?

2. Making it happen:

Class Example

The teacher selects a sample habitat to use as an example (preferably a habitat that is not local, but that the students would be able to relate to (e.g., tropical island).

Posted on the board are categories to guide thinking about the characteristics of an animal that lives in the sample habitat:

1. **What would an animal need to survive in this habitat?**

- How does the animal get food?
- How does the animal move?
- How does the animal protect itself?

2. **How might the biodiversity of the habitat help animals survive?**

As a class, come up with one characteristic of an animal for each category and describe how this would help the animal survive in the chosen habitat. (e.g., pointy beak, hopping legs and a hard shell).

Teacher demonstrates with a quick sketch on the board.

This is an important component of the science.

Core Competency:

Communication

- Connect and engage with others
- Collaborate to plan, carry out and review constructions and activities

Represent and communicate about the connection between an animal's characteristics and its survival in a specific habitat.

Core Competencies:

Creative Thinking

- Novelty and value
- Generating ideas
- Developing ideas

Critical Thinking

- Analyze and critique
- Question and investigate
- Develop and design

Questions for Guiding Inquiry

Ask questions about possible characteristics to help students connect an animal's physical characteristics to its habitat. If you are using the tropical island as an example, some of your guiding questions might be:

- ☆ Would it work to have fins in the tropical jungle?
- ☆ Would it help or hurt to be brightly coloured?
- ☆ How do the animal's characteristics help it conserve water and deal with limited resources?
- ☆ What other physical characteristics about animals might we consider?

How do the students listen, share and learn from each other?

Creature Sketch

Arrange the students into partners (by student choice or teacher selection). Ask each pair to choose a local habitat that interests them (make sure ALL the habitats have been covered). Refer back to the photographs taken on the local walk.

How do students use their observations and predictions to create their sketch?

Individually, students "quick sketch" a new species showing characteristics that correspond to the guiding questions.


1. What would an animal need to survive in this habitat?
 - How does the animal get food?
 - How does the animal move?
 - How does the animal protect itself?
2. How might the biodiversity of the habitat help animals survive?
3. What are the key characteristics of the habitat?

Students get a better understanding from self-reflection. Some options to consider are having the students create their own planning sheet or asking them to identify the steps involved throughout the creation of their creature.

Teacher asks partners to share their sketches, discuss and come together in agreement to decide on the characteristics of their new species. Students should be able to explain their reasoning.

Partners will work together to complete the "Graphic Organizer Sheet" (see [Self-Reflection sheet](#) at the end of this document).


What evidence do you see that the student listens, shares and builds collaboratively with a partner?

 Collaboratively creating a 'new species' with a partner.
Use of symbolism to create a visual representation of a 'new species' in a local habitat.

Core Competency:

Personal and Social

- Building relationships

 Create a 3D model of a 'new species' using various processes, materials and tools.

3. Makerspace:

The teacher discusses creating a three-dimensional model of the agreed upon species after the sketches have been created. Students need to be able to demonstrate how the characteristics of the animal and the habitat connect.

As a class, the tools and materials needed to create these models will be identified. There will be a review of safety concerns surrounding tools, and the particular types of teacher-assisted tools.

State the clear learning intention for the task:

Co-create with the students.

For example:

- ☆ We can create a 3D model of a 'new species' that will be able to survive in the chosen habitat.
- ☆ We will use our observations and predictions to create our 'new species.'
- ☆ We can work collaboratively to create a project together.

Suggestions:

Teachers may have a table set up with teacher-assisted tools (e.g., glue gun, drill, wire snips). For construction of the models, this can be any type of materials from simple office supplies, to recycled materials out of the recycling box to items perhaps collected from the school grounds.

Each partner group uses the materials provided to create a three-dimensional model of their species.

Criteria for the task:

- ✓ Use at least three different materials.
- ✓ Use at least one new tool you have never used before.

Criteria for the task can also be co-created with the students—giving the students more voice and choice provides a student-centred learning experience and a productive learning environment.

How does the student demonstrate understanding about how the habitat helps the animal survive?

How does the student consider the animal characteristics to create a 3D model of a 'new species' for the local habitat?

What processes, materials, tools and technologies does the student choose to support the visual art creation? Why?

Core Competency:

Personal and Cultural Identity

- Personal strengths and abilities

Core Competencies:

Communication

- Connect and engage with others
- Acquire, interpret and present information
- Explain/recount and reflect on experiences and accomplishments

Personal Awareness and Responsibility

- Self-determination
- Self-regulation

4. Tying it together:

1. Students come together in their habitat groups to share their new species.
2. Each partner group presents their reasoning for each characteristic and how that relates to how it functions in its habitat.
3. Other members may ask questions or give comments.
4. Students complete their "Self-Reflection" sheet.
5. The class comes together to share their species. Students do a gallery walk to look at all the projects.

Guided Discussion by the Teacher:

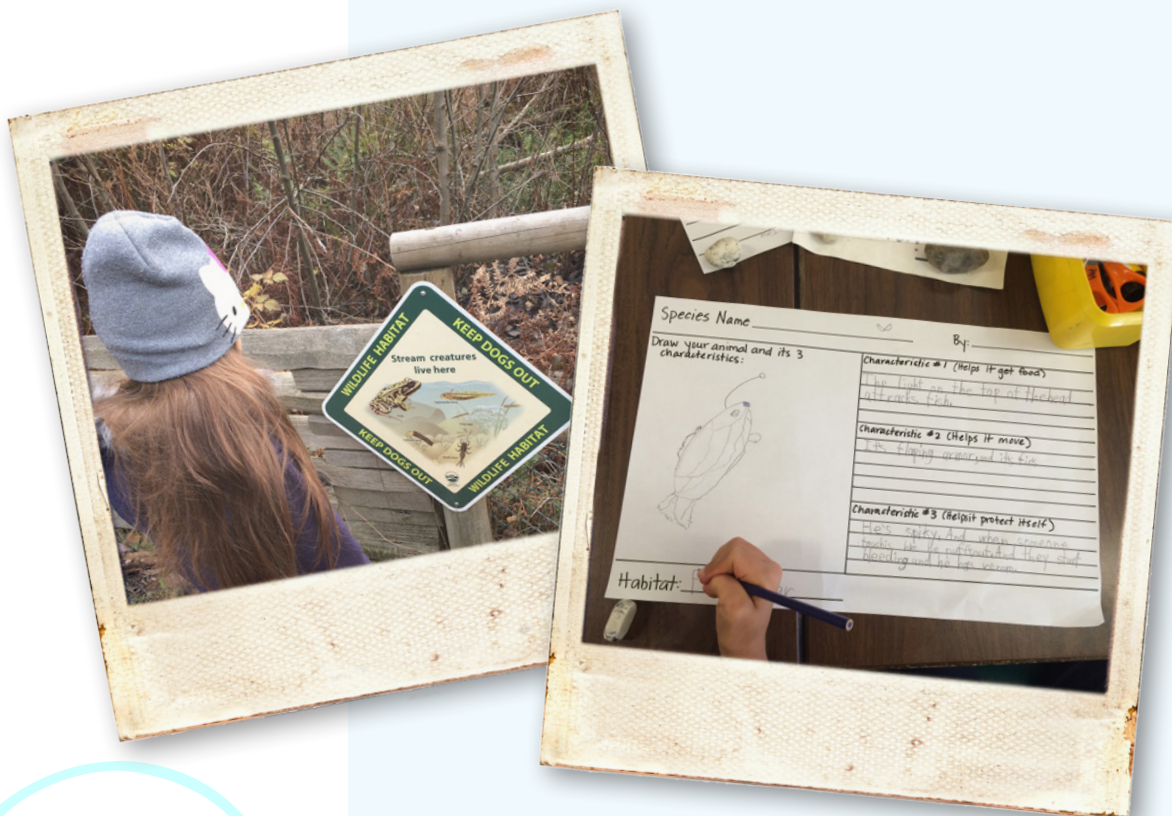
- ☆ What worked well in your Makerspace experience? What might you do differently next time? Why?
- ☆ Would your animal survive in another habitat(s)? Why or why not?
- ☆ Would it survive in real life? Why or why not?
- ☆ How does your new animal relate to the story that was presented at the beginning of the lesson?

What evidence did you see that students worked well with their partner to overcome challenges?

What evidence indicated that students learned about the biodiversity of animals in the local habitats?

What evidence indicated that students understood that the characteristics of animals affect how they survive in different habitats?

What evidence indicated that students developed an appreciation for the importance of biodiversity in our local environment?



EXTENSIONS:

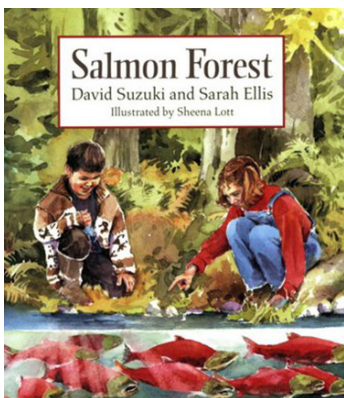
- ☆ How would your species adjust to habitat loss?
- ☆ If the habitat for your species is destroyed, could your species move to another habitat and survive? Why or why not?
- ☆ What would be the impact be for the existing animals as your species moved into their habitat?
- ☆ How might the new species connect to the food chain?
- ☆ What animal would be the prey/predator?
- ☆ Students write a story about their new species, or tell the story in the oral tradition of First Peoples as modeled through the book *Salmon Forest* by David Suzuki and Sarah Ellis.
- ☆ How did your animal come to be? (e.g., how the turtle got its shell, how the chipmunk got its stripes). Teachers could read various First Nations' stories that reflect this concept.
- ☆ Students could chose different habitat and create their own 'new species.'

RESOURCES:

www.phylogame.org (ready-made fact cards for different living organisms which can be used as examples in the lesson).

Keepers of the Earth: Native American Stories and Environmental Activities for Children by Michael J. Caduto.

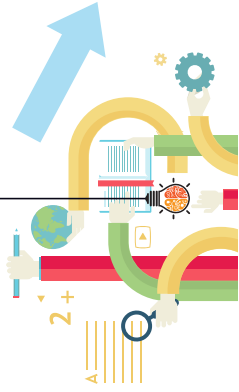
Native Northwest Educational Resources:
1640 W. 75th Ave, Vancouver BC.



The Learning Circle: Classroom Activities on First Nations in Canada
Harvey McCue and Associates.

Salmon Forest by David Suzuki and Sarah Ellis.





My Learning

REFLECTION

WITH YOUR PARTNER...

What worked well?

What was challenging?

IN THE MAKERSPACE...

What worked well?

What was challenging?

Whats the most important thing you learned?

What might you do differently next time?

TEACHER COMMENTS :

ADAPTATIONS

- Traits
- Physical or behaviour
- Survival

BIODIVERSITY

CONCEPTUAL LENS:

* Interconnectedness

LOCAL ENVIRONMENTS

- New species
- Change
- Balance

ECOSYSTEMS

- Ecosystem connections
- Place
- Habitat
- Environment
- Interaction
- Respect for living things
- Aboriginal knowledge of ecosystems



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