Lesson 1

Growth and Development

Curriculum Area: You & Your World **Topic:** Growth and Development	**Instructors:** Alice MacKay, Sara Facey, Sarah Allison, & Sarah Palmer
Grade Level: Grade 2	**Date:** January 31, 2013
Time Required: 45 minutes	**Instructional Groupings:** Small Groups (4-5 students/group) Whole Class Instruction

Outcomes & Standards:

NB You & Your World Curriculum – Grade 2

2.1.3 Students will be expected to describe changes that occur in humans as they grow, and contrast human growth with that of other organisms.

- Contrast human growth with that of other organisms
- Predict and explain needs and wants at different stages of their lives

NB Mathematics Curriculum- Grade 2

N9: Demonstrate an understanding of addition (limited to 1 and 2-digit numerals) with answers to 100 and the corresponding subtraction by:

- using personal strategies for adding and subtracting with and without the support of manipulatives
- creating and solving problems that involve addition and subtraction
- explaining that the order in which numbers are added does not affect the sum
- explaining that the order in which numbers are subtracted may affect the difference.

NSES Standards

Characteristics of Organisms Concepts

- Organisms have basic needs, which for animals are air, water, and food. Plants require air, water and light. Organisms can only survive in environments in which they can meet their needs. The world has many different environments, and distinct environments support the life of different types of animals.
- Each plant of animal has different structures, which serve different functions in growth, survival, and reproduction. For example, humans have distinct structures of the body for walking, holding, seeing and talking.
- The behaviour of individual organisms in influenced by internal cues such as hunger and by external cues such as an environmental change. Humans and other organisms have senses that help them detect internal and external cues.

Overview:

To introduce the unit on growth and development, students will predict and explain the needs and wants of different organisms at the earliest stages of their lives, by

"buying" supplies to construct a habitat for the organisms they are assigned. These needs and wants of the organisms will be compared and contrasted to the needs and wants of humans at the earliest stage of life (as babies). Groups will share their organism's habitat with their classmates, explaining why they chose the materials they did. The lesson will conclude with a class discussion and story on the natural habitats of animals.

Objective/Purpose:

As students work together to construct habitats for their animals at the earliest stages of life, they will be learning about the needs and wants of their assigned animals, sharing their findings with the class. Students will learn about how different animals, including humans, have different needs and wants.

Materials:

Materials for Students:

- KWL Charts for each group
- Chart Paper (for cluster web)
- Markers
- Calculator
- Paper and Pencil

Materials for Teacher:

- We will need 4 pictures of animals (a hamster pup, a butterfly, a chick, and a tadpole) cut into pieces for forming groups
- Checklist to check for comprehension
- For the Auction we will need to have the following items.

Needs	**Wants**
What do hamsters need? • Water • Cage • Woodchips • Pellets (aspen) • Exercise Wheel • Dish for water • Small box to live in	**Hamsters** • Car • Clothing • Junk Food • Hamster Ball • Hamster Slide
What do chicks need? • Incubator • Thermometer • Water (for moisture) • Dry Mash food	**Chicks** • Comfy Bed • Knitted hat • Television

- Water with marbles

What do babies need?

- Milk
- A place to sleep
- Love and Attention (Parents)
- Diapers
- Warmth
- Stroller
- Car Seat

Babies

- Swing
- Fancy Wardrobe
- Fur Blanket
- Tiara
- Car Bed
- Princess Bed

What do caterpillars need?

- Jar
- Leaves
- Sticks
- Soil
- Water to keep leaves fresh

Caterpillars

- Apples
- Shoes
- Glasses
- Hat
- Ice Cream

What do tadpoles need?

- Container/fish tank
- Shade
- Clean fresh water
- Cooked Lettuce

Tadpoles

- Hot Tub
- Pool
- Life jacket

Warm-Up:

Engaging Question: *What do plants/animals need to grow?*

1. Distribute puzzle pieces to all students in the class. Instruct them to find the other pieces to complete their puzzle (Hamster Pup, Butterfly, Chick or Tadpole).
2. Give each group a KWL chart and ask them to write under the 'K' column everything that they think they know about the animal that is in their picture.
3. Ask students to complete the 'W' column by writing down questions and things that they want to know about the animal in their picture. Once students have had about 10-15 minutes to complete this task, collect their charts. These charts will be handed back to students at the end of the lesson so they can assess what they have learned versus the information they thought they knew about their animal.

During the Lesson:

Mini Lesson:

1. Before students begin constructing habitats for their organisms, the teacher will lead the class in an activity to construct a habitat for a human baby.
2. The teacher will hold up a variety of items, including a bottle of milk, baby clothes, diapers, and a picture of a crib, and ask students to sort it into one of

three categories: "Need," Want," or "Does Not Need".
3. As the items are shown, the teacher will ask students guiding questions of why a baby might need or want the particular item.
4. To lead into the next activity, the teacher will ask students if they think the baby animals in their pictures have the same needs and wants as human babies – why or why not?

Exploration Phase:

1. Groups will work together and brainstorm (creating a cluster web) things that the animal in their picture <u>needs</u>.
2. The teachers will display all the items (listed in materials) one at a time and students will have to bid on the items that the animal in their picture will need (bidding will start at 5 points). Each group will be given 100 points to bid with and they must keep track of their points. (A brief review of adding and subtracting may be necessary depending on how recently you have covered this topic in Math). Explain to students that there are more than one of some items, as some animals will have similar needs, but that does not mean that their animal will necessarily get ALL the items that they need/want it to have.

Explanation Phase:

1. Have groups discuss whether or not all the items that they got at the auction are truly needs or if some of them were wants.
2. Students should separate the objects that they got into two piles (needs and wants) and write a couple of points about why the animal in their picture needs or wants each item.
3. Ask students to make a list of items that their animal would need to survive that they weren't able to get during the auction or simply wasn't as option.

Expansion Phase:

1. The teacher will facilitate a group discussion where students will work collaboratively to create a Venn Diagram comparing the needs of human babies to other baby animals. Questions to consider: *What are the differences? What are the similarities? Where do they live? What do they eat- plants? Animals? Do they hatch from an egg? Do they live outside?*
2. Now that students have had the opportunity to learn a little bit about these animals, explain to students that over the next few weeks in class we are going to be hatching, growing and nurturing these little animals and watching them grow. Each student will be assigned to a specific animal and they will work in small teams to care for their animal and observe any changes.
3. To conclude this lesson get each student to write their top 3 choices for which animal they would like to watch grow. Be sure to clarify that they may not get their first choice but they will get one of their top 3. Collect the slips of paper.
4. Ask students if they have any questions about the animals they will be studying? They will find out tomorrow what group they will be in so tonight they can start thinking about the things that each animal will need to survive- what it likes to eat, what kind of cage it prefers, how long it takes to grow/hatch etc.

Follow-Up:
Evaluation Phase:

1. Have students review and complete the 'L' column of their KWL chart by marking everything that they have learned about the animal they were discussing today.
2. Collect the KWL charts to review.

*While students are working keep a running record of students participation using a checklist.

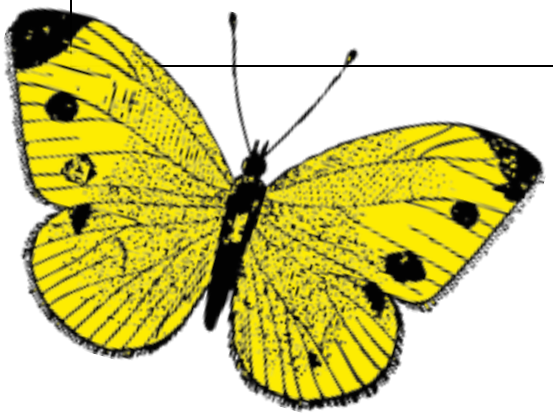
Differentiation:
We will be using small groups as a differentiation tool throughout the lesson, so that students will have a chance to work with each other to think of ideas rather than having to do this alone at the beginning of a unit. We will be giving students plenty of "think time" before they have to make their decisions as well. Differentiation during this lesson also comes from a knowledge of different learning styles. This lesson caters to visual learners as we begin the class with a photo and KWL chart. It is also interactive for kinesthetic / tactile learners as they are up moving about to retrieve and manipulate concrete objects. Auditory learners will benefit from a discussion in small groups as they decide which objects they will need. For the math portion of the lesson (adding and subtracting points), groups will have the option of using a calculator.

Assessment:
The KWL chart used at the beginning of the class can be used as a pre-assessment tool in order to observe what the students remember about "wants and needs" as they have seen this topic before in other grades.
We will use a checklist in order to assess whether or students can classify objects into wants and needs for specific animals, as well as if they are able to explain the reasons they chose certain items for each category.

Wants & Needs

Name: _____ Date: _____

What do you **know** about mealworms?	What do you **want** to know about mealworms?	What have you **learned** about mealworms?



Lesson 2

Growth and Development

Curriculum Area: You & Your World **Topic:** Growth and Development	**Instructors:** Alice MacKay, Sara Facey, Sarah Allison, & Sarah Palmer
Grade Level: Grade 2	**Date:** February 28, 2013
Time Required: 45 minutes	**Instructional Groupings:** Whole Class Pairs

Outcomes & Standards:

N.B. You & Your World Curriculum – Grade 2

2.1.1 Students will be expected to describe the growth and development of familiar animals during their life cycle.

- Observe and describe the changes in appearance of an organism during its life cycle
- Identify things that remain constant and those that change as organisms grow and develop

2.1.2 Students will be expected to identify a variety of sources and ideas related to the life cycle of animals and to illustrate key concepts in animal development.

- Use terminology and language about animal development that others can understand

2.1.3 Students will be expected to describe changes that occur in humans as they grow, and contrast human growth with that of other organisms.

- Contrast human growth with that of other organisms

NSES Life Sciences Standards Levels K-4
Characteristics of organisms
Life cycles of organisms

Overview:

This SmartBoard lesson is designed to introduce to students to key terms related to the growth and development of animals. Students will also learn about the life cycles of two familiar animals – butterflies and frogs – and compare these life cycles to their own human life cycles. Throughout the SmartBoard lesson, students will be working in pairs to try to solve the problem before doing the activity together as a class on the SmartBoard. Students will also be given mini whiteboards to answer quick assessment questions as the lesson progresses.

Objective/Purpose:

The purpose of this lesson is introduce students to terminology associated with the growth and development of animals and get students comfortable with talking about the changes and similarities of the different stages in the life cycles of animals.

Students will also begin to compare the growth and development of humans to the growth and development of other animals.

Materials:

SmartBoard
Individual whiteboards
Dry erase markers
Animal cut outs (see attached handouts)
Scissors

Warm-Up:

Engaging Question: *What is inside?*

1. Show students a picture of an egg on the SmartBoard lesson. Ask them to think about what is inside the egg.
2. Have students draw a picture of what they believe is inside the egg.
3. Once students have drawn their picture, have some or all students explain to the class why they drew what they did.
4. Ask students some of the following questions: What animals do you know of that start their lifecycle as an egg? Are all these eggs the same? How long do you think it takes for an egg to hatch?

During the Lesson:

Exploration Phase:

1. Introduce students to 5 key terms for this unit: development, growth, habitat, life cycle, and reproduction (See page 3 of SmartBoard lesson). Have students working in pairs and give each pair one copy of Handout 1 and Handout 2 (attached). Have students cut out the five terms and definitions and work together to match the term to the proper definition. Once all pairs have completed this, start calling students up to the SmartBoard to draw a line matching the pairs on the board. Discuss each term with students as you go through the list.
2. Show students page 4 of the SmartBoard lesson. Ask students why they think it says the life cycle of a butterfly but the picture is of a caterpillar.
3. With students working in pairs again, give each pair a copy of Handout 3 and have students cut out the images and order the images the best they can to create the life cycle of a butterfly.
4. Once students have complete the activity on their desk, click the link to the online interactive activity on page 5 and call students up to fill in the different stages of the life cycle. It is important to discuss the proper terms of each stage of the life cycle (i.e. caterpillar, chrysalis, adult butterfly, etc.).
5. On page 6 of the SmartBoard lesson, have students come up to the SmartBoard to properly label each stage of the lifecycle. Ask students why the arrow goes from the butterfly back to the egg? Ask students which stage of the life cycle is most closely related to the baby stage of a human? (caterpillar

stage) It is important that students are able to justify their answers.

6. Show students the multiple choice question on page 7 and have students write their answers (A, B, or C) on their whiteboards. Have students raise their boards to show their answers and check off how well they understand on the attached assessment sheet. Show students the answer on page 8 and have a student(s) explain why this is the correct answer.
7. Introduce the life cycle of frogs to students by giving each pair Handout 4 and having them order the images (just like with the butterfly activity.
8. Click the link on page 10 to complete the online interactive activity for the life cycle of frogs. Once again, it is important to discuss the labels of each stage of the life cycle.
9. On page 11, have students properly label each stage of the frog's life cycle. Have students compare frog eggs to the butterfly eggs. Ask students what changes and what remains the same at each stage of the life cycle.
10. Show students the multiple choice question on page 12 and have students write their answers (A, B, or C) on their whiteboards. Have students raise their boards to show their answers and check off how well they understand on the attached assessment sheet. Show students the answer on page 13 and have a student(s) explain why this is the correct answer.

Explanation Phase

1. Review the life cycles of frogs and butterflies and quickly discuss the stages of human life cycles.
2. Have students compare tadpoles to caterpillars to babies, looking at the similarities and differences of both.

Expansion Phase:

1. Using page 14 of the lesson and Handout 5, have students match the young animal to the proper adult. As students are matching these in pairs, have them discussing how the adult animal has changed since it was young (differences and similarities).
2. Have students come up to the board and draw lines to match the young to the adults, just as they had done in pairs.

Follow-Up:

Evaluation Phase:

1. Ask students the following true or false questions. Students should write their answers on their whiteboards and then explain their answers after showing their boards. Record students' understandings on the attached assessment sheet.

- True or False: All animals, even humans, go through a life cycle, starting from birth.
- True or False: All animals grow and develop in the exact same way.
- True or False: The habitat an animal lives in affects how it grows and develops.

2. It is especially important to discuss the last question, by prompting students

with questions such as "Would a frog be able to grow and develop if it was in a desert or not near any water?"

Differentiation:

This lesson is differentiated by having students working in pairs to match the pairs and order the life cycles. This will allow students to verbally discuss their ideas and hear the ideas of their classmates. This lesson is also highly visual, as pictures are provided on handouts and on the SmartBoard. There is also a lot of interaction, as all students should have at least one opportunity to come up to the SmartBoard, and all students will get to use the whiteboards for the assessment questions, so they will remain engaged throughout the lesson.

Assessment:

Throughout the lesson, there are 2 multiple choice questions and 3 true or false questions that students will be answering on their white boards. As students show their answers on the whiteboards, complete the following record sheet:

Student Names	Question 1 MC	Question 2 MC	Question 3 T/F	Question 4 T/F	Question 5 T/F	Notes

Check off if students have the correct answer. Also note if students are able to explain their answer (right or wrong) or if they decide to change their wrong answer to the correct answer after hearing their classmates explain their decision (choosing the right answer).

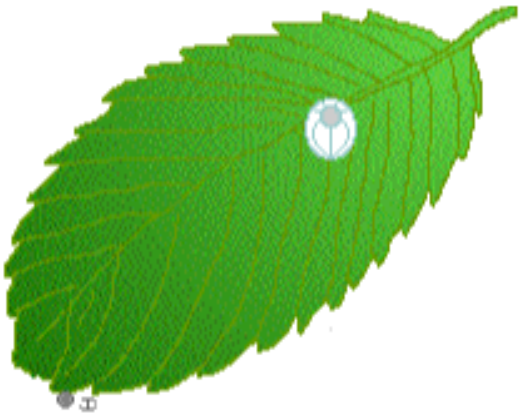
Handout 1

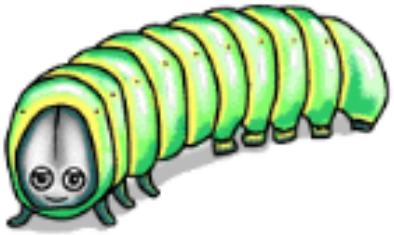
Development
Growth
Habitat
Life Cycle
Reproduction

Handout 2

The changes that occur in an animal's lifetime from birth to death.
Changes that occur in animals as they become adults
Animals producing offspring, or young.
Animals becoming larger.
The place or environment in which an animal normally lives.

Handout 3





Handout 4

Handout 5

Lesson 3

Growth and Development

Curriculum Area: You & Your World **Topic:** Growth and Development	**Instructors:** Alice MacKay, Sara Facey, Sarah Allison, & Sarah Palmer
Grade Level: Grade 2	**Date:** January 31, 2013
Time Required: Ongoing project for 4 weeks.	**Instructional Groupings:** Small Groups (3 students/group)

Outcomes & Standards:

NB You & Your World Curriculum – Grade 2

2.1.3 Students will be expected to describe changes that occur in humans as they grow, and contrast human growth with that of other organisms.

- Contrast human growth with that of other organisms
- Predict and explain needs and wants at different stages of their lives

NSES Standards

Overview:

This lesson will begin by introducing the major project for the unit. Students are already familiar with key growth and development terms such as lifecycles, habitat, reproduction and death. Students will forms groups of three and are given five mealworms to care for and experiment with for the duration of this project. In the first lesson the teacher will introduce students to the mealworms and show them how to make a prediction and do an experiment, as they will be given the opportunity to do this in the coming weeks.

Objective/Purpose:

The purpose of this lesson is to give students a hands on experience in working with lifecycles, and understand the growth and development of a mealworm.

Materials:

Each student will need:

- Observation journal
- Sticky note and pen

Each group of student will need:

- 5 mealworms
- A box
- A "Mealworm growth and development chart"
- Camera (with recording)
- Notebook Computer

Teacher will need:

- Mealworm (5)
- Paper (with start and finish line)
- "Mealworm" movie trailer
- SmartBoard or Whiteboard and markers
- Table stocked with various materials such as: newspaper strips, plastic bags, cotton balls, cereal, grapes, carrots, apples, raisins, dried rice, croutons, a stuffed animal and any other objects the teacher chooses to include.
- Rubric for journal and movie
- Checklist for "Growth and development chart" and mealworm lifecycle presentation

Warm-Up:

Engaging Question: *How do mealworms need to grow?*

1. Show students the "Mealworm" movie trailer to get students excited about this project and familiar with mealworms.
2. Do a KWL Chart with students to gauge what they know about mealworms, and what they want to know. This will allow the teacher to accommodate the project to suit students' needs.

During the Lesson:

Exploration Phase (Spread over 4 weeks):

1. Gather students in a designated area and set a mealworm racetrack to race three mealworms.
2. Teacher explains that a prediction is when you make a guess about a certain outcome, what will happen during an experiment and why. Class develops group prediction as an example about which worm will be fastest and why.
3. Students take out their whiteboards and write their personal prediction in a complete sentence.
4. Set up the mealworms behind the starting gate. Release the mealworms to begin the race. (Silent cheering from the students is acceptable.)
5. Review the class prediction and have a discussion about students' individual prediction and what types of things may have influence the race (i.e was one worm tired? Does the length of the mealworm matter?)
6. Teacher is going inform students that they will be working in groups to raise mealworms for the next couple of weeks. At this time the teacher will ask students to get into groups of 2-3 and get a shoebox from the front of the class; this will be the worms home for the next few weeks. Once students have chosen their box ask them to make sure that there are no holes that the worm can escape from! (The teacher will have already done this but you can never be too sure). Inform students that they must wear plastic gloves when handling mealworms because they are unsanitary.
7. Ask students to brainstorm about what the mealworm may want in their box in order to grow. They may come up with things like food, sunlight, water and

toys. At this point the teacher will reveal a table filled with various items that students can choose to put in their box. Items may include, but are limited to, newspaper, plastic bags, cotton balls, cereal, grapes, carrots, apples, raisins, dried rice, croutons, a stuffed animal etc.

8. Students are given ten minutes in their small groups to discuss what they want to include in their mealworm box. Students can not chose more than four different object to put in their box at today.
9. Once students have fully developed their mealworms home, each group will be given five mealworms to work with. Students will need to measure and record their mealworms before putting them into their boxes.
10. Over the next 3-4 weeks students will monitor the growth and development of their mealworms. During Language Arts (Daily 5) students will write a journal about the changes in their mealworms and make observations and note any changes that have occurred. They may also draw or take a picture to put into their journal.
11. Once a week students during You and Your World students will be given the period to do an experiment of their choice with their worms. Encourage students to do experiments that do not intentionally kill their worms. Students will have the opportunity to do three experiments. They will need to make a prediction, ask a question and comment on the results. Please see attached template for experiments. Additionally, students be required to measure their mealworms twice a week and record their measurements on the attached graph.

Explanation Phase (1 class):

1. Groups' pair up and discuss their results. What happened to your mealworms? Did anyone predict this? How big was the biggest mealworm? How did it change? Why did it get smaller?
2. Groups are given a piece of chart paper to draw what they believe to be the lifecycle of the mealworm.
3. Students will share their mealworm lifecycle chart with the class. Once all groups have shared their lifecycle chart, we will have a class discussion about the growth and development of mealworms.

Expansion Phase:

1. To develop students' higher order thinking skills we will pose the question on the board and ask "Why did the mealworm become a beetle?"
2. Students will each be given a post-it note to write their answer. After giving students a couple of minutes to think about their answer they will write it down on the sticky note and post in on the board.
3. Teacher will facilitate a discussion about the question and the students answers and the lifecycle of a mealworm. Ideally, the discussion with result in students drawing connection to other lifecycles they have studied particularly the butterfly.

Follow-Up:

Evaluation Phase:

1. Students will gather the photographs and movie clips from their mealworm observations and experiments to create a short movie trailer that portrays their lifecycle.
2. Using MovieMarker or iMovie students work in groups to create their movie trailer.

**Note we are under the assumption that technology is readily available in the classroom and students have already been taught now to use these software programs properly.

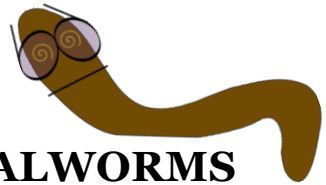
3. Students will show their videos to the class as a way to formally conclude this project.
4. Student will be formally evaluated on their final presentation about the lifecycle of a mealworm. If there are students at this point who do not demonstrate a strong understanding of growth and development we will be doing interactive learning centers the following class to bring this unit to a close. During the learning centers the teacher will use this time to work one-on-one with students to ensure that this topic is clear to all students.

Differentiation:

This lesson is differentiated by design, as students will be working in groups. Groups could be designated to ensure that students who are hesitant to touch the worms are paired with those who are not afraid of the mealworms. For this project students are able to be creative and think outside the box and chose three experiments independently. Additionally, there are several activities that construct this project that allow all learners to succeed- there are activities that appeal to visual, auditory, kinaesthetic, special, tactile and naturalist learners. Students who struggle with writing have the opportunity to use pictures to illustrate their observations as well.

Assessment:

Students will be assessed based on their final journal with their observations (see attached rubric), students understanding of the lifecycles will be assessed in the form of a running record and check for completion of the “Mealworm growth and development chart” (see class list for look fors). The final presentation of the poster will be used a final project for this unit to gauge students learning for the unit and will be assessed on a simple 4-point scale (4 being students have a strong understanding of growth and development, 1 being students do not grasp this topic).



MEALWORMS

Name: _____ Date: _____

What do you **know** about mealworms?	What do you **want** to know about mealworms?	What have you **learned** about mealworms?
_____	_____	_____
_____	_____	_____
_____	_____	_____
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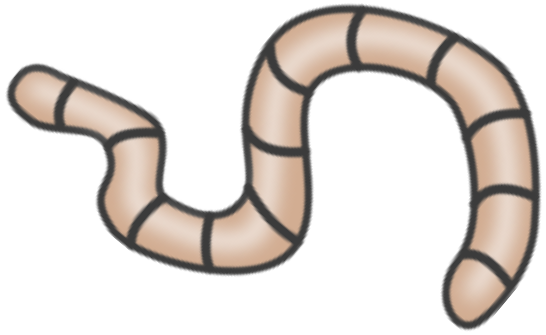

Mealworm Growth and Development Chart

Group Members: _____

	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	
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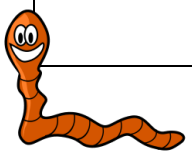
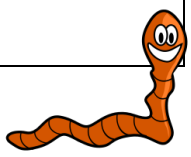




Completion Checklist for Weekly Measurements

Week1 –Week 4

Student Name	Measurements Taken (Yes/ No)				Observations made (Yes/No)				Additional Comments

Rubric: Observation Journal

Observation Journal Criteria	Excellent 4 pts	Very Good 3 pts	Adequate 2 pts	Needs Improvement 1 pts
Observations of change	Excellent Many observations are made with additional comments or facts. Goes beyond the minimum requirements.	Very Good Some observations are made with some comments or explanations. Meets all of the requirements.	Adequate Few observations are made with few explanations.	Needs Improvement Observations and explanations are not included in the journal.
Experiment descriptions	Excellent Experiment descriptions are detailed and include explanation of prediction and results.	Very Good Experiment descriptions are provided and include student predictions and results.	Adequate Experiments are identified but predictions and results are unclear.	Needs Improvement Experiments are not identified, no evidence of predictions or results.
Drawings	Excellent Drawings are a good representation of what students observed and are colored and visually appealing. Effort is extremely apparent.	Very Good Drawings are a good representation of what students have observed; some effort is apparent.	Adequate Drawings are present but do not really represent what students have observed.Effort is apparent.	Needs Improvement Drawings are not present. Journal demonstrates a lack of effort.

The following is a checklist of expectations listing what students need to include in their movie clips. A larger version of this chart would be distributed to groups as a point of reference when they are creating their movies.

What to include in preparing their movie about the lifecycle of a mealworm?	**Done**
The 3 stages of mealworm growth are included and described	
A minimum of 2 facts about mealworms are stated	
Some sound effects are used	

Movie Rubric

Group Members: _____

	4	3	2	1
Stages of mealworm growth	All 3 stages of mealworm growth are clear	2 stages of mealworm growth are presented	1 stage of mealworm growth is mentioned	Stages of mealworm growth are not included
Facts about meal worms	A minimum of two accurate facts about mealworms are included	Only 1 fact about mealworms is included	There is a fact about mealworms but it is false	No facts about mealworms were included
Sound effects are included	Students use sound effects to enhance movie	Some sound effects are used	Few sound effects are used	There are no sound effects used
Creativity	The movie is original and reflects students learning	Some evidence of creativity is obvious	Minimum creativity is included	Little effort is put into the movie

Additional Comments:

Lesson 4

Growth and Development

Curriculum Area: You & Your World **Topic:** Growth and Development	**Instructors:** Alice MacKay, Sara Facey, Sarah Allison, & Sarah Palmer
Grade Level: Grade 2	**Date:** February 28th, 2013
Time Required: 3-4 Weeks	**Instructional Groupings:** Small Groups (3-4 students/group) Whole Class Instruction

Outcomes & Standards:

NB You & Your World Curriculum – Grade 2

2.1.3 Students will be expected to describe changes that occur in humans as they grow, and contrast human growth with that of other organisms.

- Predict and explain needs and wants at different stages of their lives

NB Mathematics Curriculum- Grade 2
GCO: Number (N): Develop number sense
SCO: N6: Estimate quantities to 100 using referents.

GCO: Shape & Space (SS): Use direct or indirect measurement to solve problems
SS2: Relate the size of a unit of measure to the number of units (limited to nonstandard units) used to measure length and mass (weight).

NSES Life Sciences Standards Levels K-4

- Characteristics of organisms
- Life cycles of organisms
- Organisms and environments

Overview:

Students will begin by brainstorming about human growth using a cluster web. Students will they create books about their lives, how they have changed from birth to now and how they will continue to change as they grow.

**Note At the beginning of the year students will measure each other, they will make a chart and then the students will make a prediction of who will grow the most and the least by the time we do our growth and development unit. Today students will measure each other to see whose predictions are correct. They will then make predictions again for the end of the year. They will measure each other again at the end of the year and compare their predictions. As a class we will discuss who has changed the most, possibilities to why they have grown and talk about whom they think will grow the most.

Objective/Purpose:

The purpose is for students to learn about human growth by discovery. At the end of this lesson students will understand the human life cycle and they will be able to make predictions about their own growth and development.

Materials:

- Chart Paper
- White Board/Markers
- All about me booklets

Warm-Up:

Engaging Question: *How do humans grow?*

1. Students will be paired up and talk about what they know about what they know about human growth.
2. On the board we will have a few words to prompt the students such as :
    a. Babies
    b. Adults
    c. Wants
    d. Needs
    e. Life Cycle
    f. Habitats
    g. Growth
    h. Development

During the Lesson:

Exploration Phase:

1. Students will work in groups of 3-4.
2. Students will create cluster webs on chart paper writing down ideas about what they know about human growth.

Explanation Phase:

Mini Lesson:

3. Once students have finished their cluster webs, we will have a class discussion about what they have written down.
4. Once we have discussed what they already know we will talk about what they want to learn.
5. This allows students to talk about what they have discussed with their groups, and to learn about what other groups have discussed.

Expansion Phase:

1. Students will create their “All about me booklet.”
2. In this booklet students will answer the include the following items:

a. A picture of you: now, as a baby and draw what you think you will look like in 20 years
b. Answer the following questions
    i. How have you changed since you were a baby?
    ii. How do you think you will change in the next 20 years?
    iii. What did you like to do when you were a baby?
    iv. What do you like to do now?
    v. What do you think you will like to do 20 years from now?
    vi. What do babies need?
    vii. What do you need now?
    viii. What do you think you will need when you grow up?
    ix. How tall were you as a baby?
    x. How tall are you now?
    xi. How tall do you think you will be in 20 years?
    xii. What can babies do?
    xiii. What children can do?
    xiv. What can adults do?
3. Have students present their booklets to the class.

Follow-Up:

Evaluation Phase:

1. During the class discussions and cluster web formation have a checklist to check for participation of all students.
2. Have students present their booklets to the class and collect them to check for understanding.
3. Students will be given a rubric and booklets will be collected and marked using that rubric.

Differentiation:

Small groups will be used throughout the lesson as differentiation, giving students a chance to discuss ideas with their peers rather than having them discuss them on their own. Students will be given room for creativity allowing different students to shine. Students will also be permitted to use the computer if they struggle with fine motor skills.

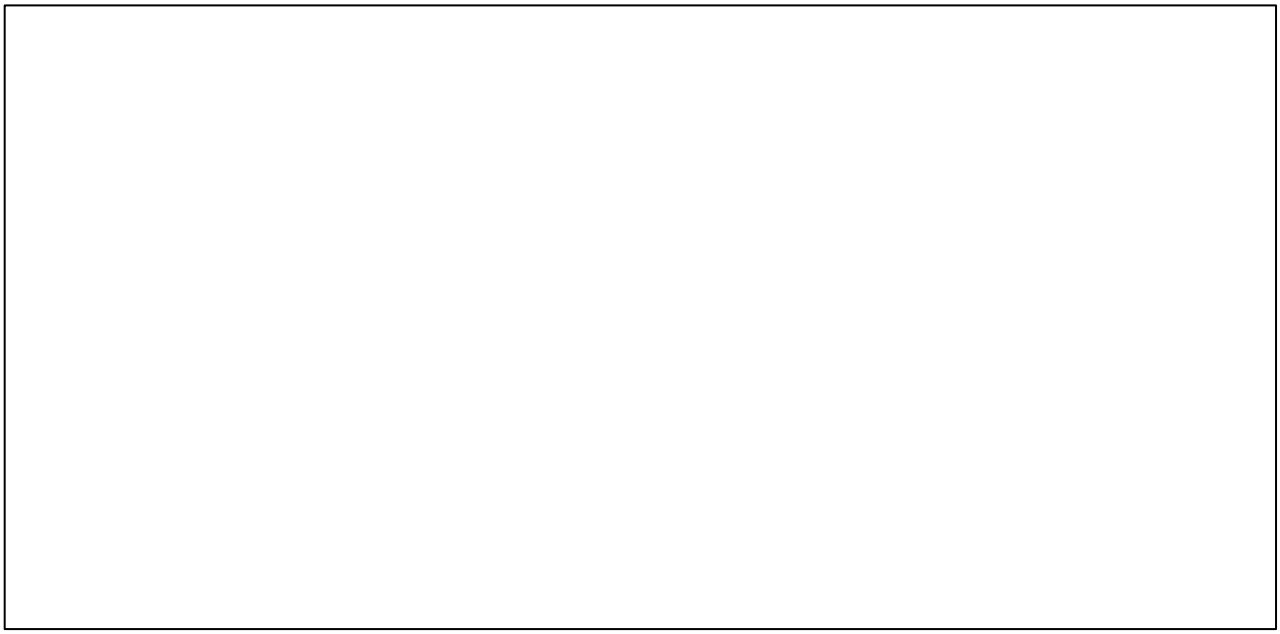
Assessment:

Students will be assessed on participation for the class discussion and for creating cluster webs with their classmates. Students will also be assessed when their "All about me booklets" are collected and marked using the rubric they have been given.

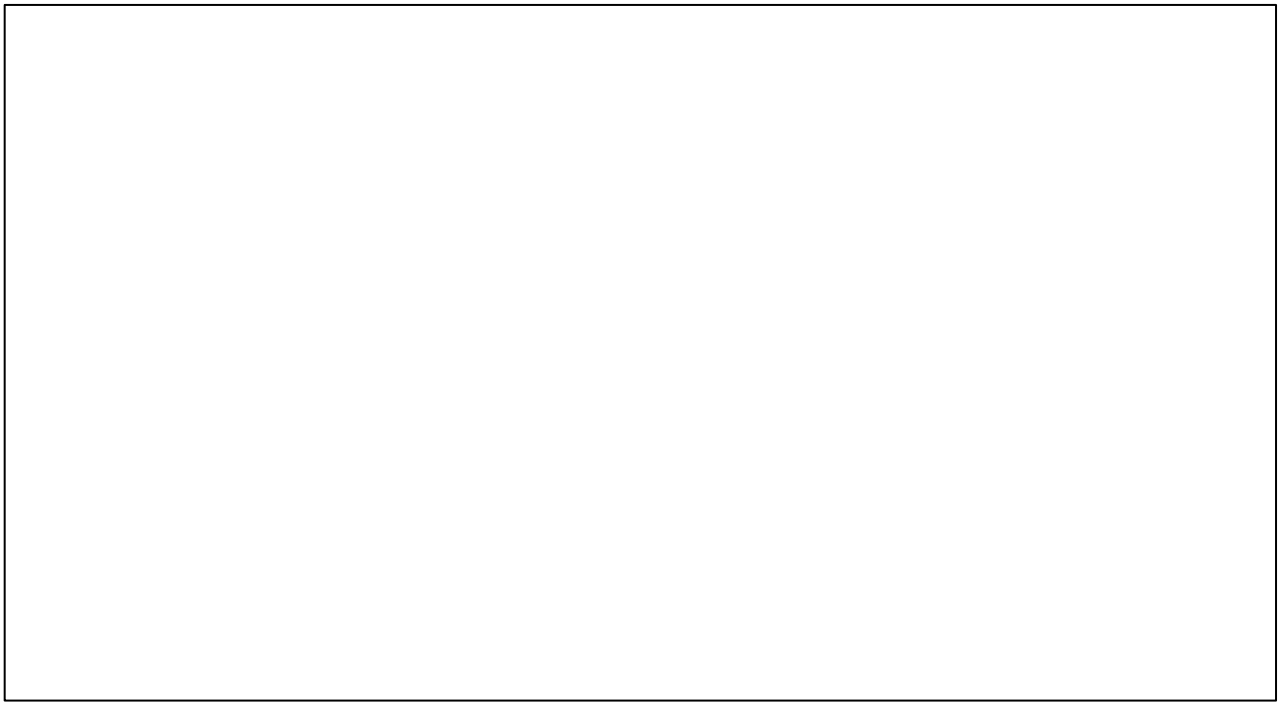
“All About Me” Rubric

Writing	1	2	3	4
Comprehensive	Answers make little to no sense and not much detail in the answers.	Some answers make sense and there is some detail in the answers.	Questions have good, well explained answers	Students go above and beyond providing a lot of detail and well-explained answers.
Clarity	Not very easy to read. A struggle to understand what they have written.	Legible, but still not easy to read. Some difficulty to understand.	Legible, easy to read and easy to understand.	Extremely neat and easy to read. Answers make sense.
Conventions	Little to no use of conventions. Missing uppercase letters and punctuation	Some use of conventions. Missing some uppercase letters and punctuation.	Good use of conventions. May be missing a few uppercase letters and punctuation.	Great use of conventions. Almost always uses uppercase letters and punctuation in the proper places.

All About Me!

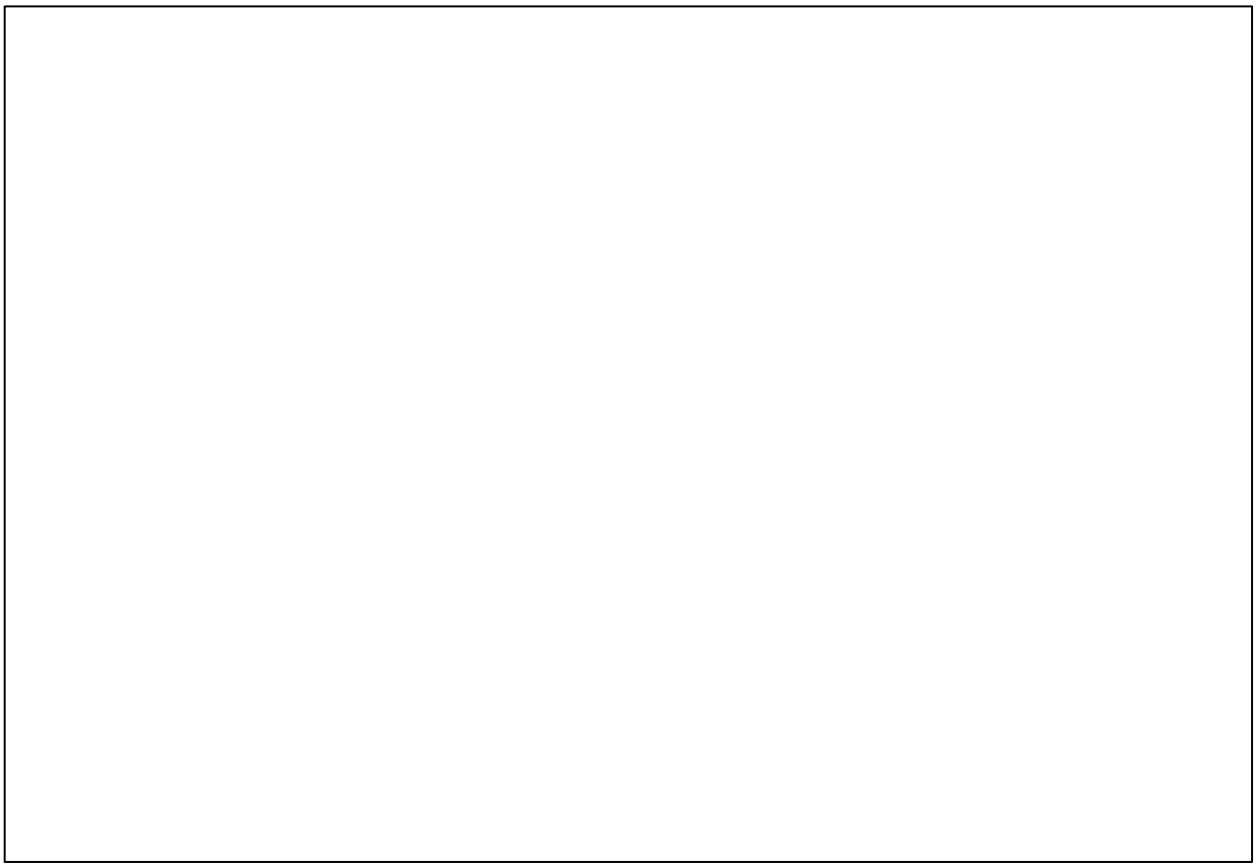


A picture of you as a baby



A picture of you now

Draw a picture of what you think you will look like in 20 years.



How have you changed since you were a baby?

I have grown up a lot. I am a lot bigger, taller and older. I have long curly hair. I have a lot of teeth

How do you think you will change in the next 20 years?
I think that my hair will turn gray. I think that I will have shorter hair. I will probably have some wrinkles in my face. I also think that my hair will be thinner than it is now.

What did you like to do when you were a baby?

What do you like to do now?

What do you think you will like to do in 20 years?

What do babies need for them to grow?

What do you need for you to grow?

What do adults need for them to grow?

How tall were you as a baby?

How tall are you now?

How tall do you think you will be in 20 years?

What are some things that babies can do?

What are some things that you can do that babies can't do?

What are some things that adults can do that you can't do?

Lesson 5
Growth and Development

Curriculum Area: You & Your World **Topic:** Growth and Development	**Instructors:** Alice MacKay, Sara Facey, Sarah Allison, & Sarah Palmer
Grade Level: Grade 2	**Date:** February 28th, 2013
Time Required: 30 minutes	**Instructional Groupings:** Small Group (3-4) Whole Class Instruction

Outcomes & Standards:

NB You & Your World Curriculum – Grade 2

2.1.3 Students will be expected to describe changes that occur in humans as they grow, and contrast human growth with that of other organisms.

- Contrast human growth with that of other organisms
- Predict and explain needs and wants at different stages of their lives

Overview:

As a class students will brainstorm rules, guidelines and goals that they would like to follow/achieve as a class.

Objective/Purpose:

For students to understand that Growth and Development is not just about physical growth. Not only do we grow physically, but also we grow mentally and as a part of their personality.

Materials:

- Chart Paper
- Markers

Warm-Up:

Engaging Question: *How can we make our classroom a better place?*

1. As a class we will read "Oh The Places You'll Go" by Dr. Seuss.

During the Lesson:

Exploration Phase:

1. Students will work in small groups (3-4 students) and talk about what they would like to achieve as a class.

Explanation Phase:

Mini Lesson:

2. As a class students will present ideas that they think would be good goals for us to achieve as a class.
3. We will write them on chart paper at the front of the room.

Expansion Phase:

1. We will talk about SMART goals, and reflect on if our goals our achievable.
    a. S-Strategic
    b. M-Measureable
    c. A-Achievable
    d. R-Results Oriented
    e. T-Time Bound
2. By doing this we will be able to narrow down some of the goals.
3. Have students write down the goal we have chosen.

Follow-Up:

Evaluation Phase:

1. This will be evaluated by the students copying it down in their books and us checking for completion

Differentiation:

Small groups will be used throughout the lesson as differentiation, giving students a chance to discuss ideas with their peers rather than having them discuss them on their own. Students will be given room for creativity allowing different students to shine. Students will be able to use the computer to write down their goals if they struggle with fine motor skills.

Assessment:

Students will be assessed on completion. We will have a checklist and mark down whether or not students have it written down.

Checklist for Class Goals

Student's Name	Goals (Yes/No)	Additional Comments

Lesson 6

Growth and Development

Curriculum Area: You & Your World **Topic:** Growth and Development	**Instructors:** Alice MacKay, Sara Facey, Sarah Allison, & Sarah Palmer
Grade Level: Grade 2	**Date:** February 28, 2013
Time Required: Approximately 2 hours (Spread out over the last 2-3 lessons in the unit)	**Instructional Groupings:** Individual Small Groups

Outcomes & Standards:

N.B. You & Your World Curriculum – Grade 2

2.1.1 Students will be expected to describe the growth and development of familiar animals during their life cycle.

- Compare the life cycles of familiar animals and classify them according to their similarities and differences
- Observe and describe the changes in appearance of an organism during its life cycle
- Identify things that remain constant and those that change as organisms grow and develop

2.1.2 Students will be expected to identify a variety of sources and ideas related to the life cycle of animals and to illustrate key concepts in animal development.

- Identify and use various sources of information and ideas
- Communicate procedures and results, using drawings, demonstrations, as well as written and oral descriptions.

2.1.3 Students will be expected to describe changes that occur in humans as they grow, and contrast human growth with that of other organisms.

- Contrast human growth with that of other organisms

NSES Life Sciences Standards Levels K-4
Characteristics of organisms
Life cycles of organisms
Organisms and environments

Overview:

8 learning centres were created to accompany a bulletin board for students to use throughout this unit. After being introduced to the topic of growth and development of humans and animals with teacher-led lessons, students will now be able to further explore what they know and expand their knowledge further, by engaging in these various activities with little teacher guidance. The centres are designed to be cross-curricular, with some of the activities incorporating language arts, math, and/or visual arts. Students should be encouraged to engage in these activities with little guidance, applying their own knowledge to the activities. The only role of the

teacher should be too prepare these discovery-based centres and monitor students to ensure all students complete the important activities. Since it is highly student-focussed learning, this time will also be used to meet with students in smaller groups to formatively check student understandings to instruct future lessons. These learning centre activities have been set up in "must do," "should do," and "could do" categories, as students may not get to complete all activities due to time constraints.

Objective/Purpose:

The purpose of these learning centre activities is for students to engage in hands-on, discovery-based learning. Students will be able to apply the knowledge they already have about animal and human growth and development, as well as engage in activities that will expand their knowledge of the subject area. As a result of these activities, students will be able to better understand the different stages of development of familiar animals, as well as the differences and similarities between different stages and the life cycles of different animals.

Materials:

All materials will be sorted by centre, with each centre having a separate box to keep materials in. The materials for each centre is as follows:

1. "Frog Life Cycles"
    - Instruction and activity sheets
    - Pencils
    - "National Geographic FROGS!"
    - Computer set up with headphones and pre-recorded podcast (should also be set to the website to create the tagxedo, www.tagxedo.com)
    - Printer hooked up to the computer to print tagxedo
2. "Growing Snow"
    - Instruction sheet and piece of paper
    - Pencil
    - Package of Insta-Snow
    - Food coloring (3 different colors)
    - Cups (with water available)
    - Spoon
3. "The Hungry Caterpillar"
    - Instruction sheet and pre-cut circles
    - Pencils and pencil crayons
    - Computer or iPad to show the video on (with headphones)
4. "Growing Chart"
    - Instruction and activity sheets
    - Pencil
    - Metre stick
5. "Feeling the Life Cycle"

- Instruction/activity sheet
- Pencils
- 4 decorated shoeboxes with a slit in the top for students to reach in and feel the contents inside the shoebox, as follows:
    - 1 – egg
    - 2 – peeled grapes, or anything else that is slimy to represent a chick when it first hatches from the egg
    - 3 – soft stuffed animal, or anything else that is fluffy to represent a chick
    - 4 – feathers, or anything else feathery to represent a chicken

6. "If You Were a Baby Penguin…"
    - Instruction sheet
    - Paper and pencils
    - Computer or iPad opened to the National Geographic website to read about the emperor penguin
7. "Spin the Wheel"
    - Bulletin board with animal wheel attached
    - Instruction sheet
    - Bucket full of random objects (things found in nature, random household items, etc.)
8. "Memory Game – Matching Animals"
    - Instruction sheet
    - Laminated deck of cards with pairs of young and adult animals

**All instruction and activity sheets to be used at the learning centre are attached.

Warm-Up:

Have students select an activity to begin with. Instructions for each activity will be provided in the box at the learning centre, so students should be able to follow the instructions, completing the activity, checking in with the teacher before moving onto the next activity.

During the Lesson:

<u>"Must Do" Activities:</u>

1. "Frog Life Cycles"
    - Using the book "National Geographic FROGS!" and a podcast, students will answer questions and create a vocabulary list of words about the life cycle of frogs. Students will also create a "tagxedo" as a final part of this activity.
    - *Explanation, Exploration, Expansion*
2. "Growing Snow"
    - In this activity, students will engage in a hands-on experiment about growing insta-snow, using different amounts of powder in each cup. Students will be making predictions and recording their observations on

this experiment on growth.
- *Engaging Question, Exploration*

3. "The Hungry Caterpillar"
   - Students will watch a video of *The Hungry Caterpillar* and then construct a paper caterpillar containing information about the life cycle of a caterpillar/butterfly. Students will also get to be a bit creative in this activity, designing the caterpillar, and thinking of questions and answers for the caterpillar to answer.
   - *Explanation, Evaluation, Expansion*
4. "Growing Chart"
   - Students will become actively engaged in measuring their height and foot size, making predictions about the sizes of their feet and other objects, given their height. This will be a collaborative activity, as students will be comparing their measurements and making predictions together.
   - *Expansion, Evaluation, Exploration*

<u>"Should Do" Activities:</u>

5. "Growing Chart"
   - Students will become actively engaged in measuring their height and foot size, making predictions about the sizes of their feet and other objects, given their height. This will be a collaborative activity, as students will be comparing their measurements and making predictions together.
   - *Expansion, Evaluation, Exploration*
6. "Feeling the Life Cycle"
   - This is a sensory activity that will have students making predictions about what animal's life cycle is represented by the four boxes. The four boxes represent the four different stages of the life cycle of a chicken: egg, birth (slimy), chick (fluffy), and chicken (feathery). Students will describe what they feel in each box, and then make a prediction of what animal they believe follows those stages of a life cycle.
   - *Engaging Question, Exploration*
7. "If You Were a Baby Penguin…"
   - Using this writing prompt, students will write a story about a penguin coming to live in Fredericton, and how this move will affect the penguin's growth and development.
   - *Engaging Question, Expansion*

<u>"Could Do" Activities:</u>

8. "Spin the Wheel"
   - Students will using the wheel attached to the bulletin board to spin a random animal. Students will then select 3 items from a box full of random items that would help that animal grow and develop. Students will have to justify their choices to other students.
   - *Evaluation*
9. "Memory Game – Matching Animals"
   - Students will match young animals to adult animals in a typical game of

memory. Once all the cards have been matched, students will go back through their cards and describe what has changed and what has remained the same as the animal has grown and developed.

- *Evaluation*

Follow-Up:

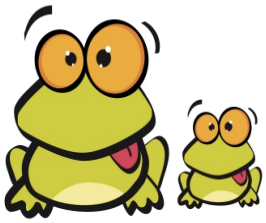
With students working on their own or in small groups at the learning centre, the teacher should be able to check in periodically with all students, at least once, to check their understanding and see what topic areas need to further covered.
Once the learning centre activities have come to a conclusion, I would conclude the activities by having a group discussion with the class, about their predictions and observations. Especially for activities such as "Growing Snow," "Growth Chart," and "Feeling the Life Cycle," students should have a chance to discuss if their predictions differed from their observations, and why they think this might be.

Differentiation:

The learning centre activities incorporate a range of activities that appeal to different learning styles. There are many auditory options, a sensory activity, many visuals, as well as hands-on learning. For many of the activities, students are also working collaboratively, which gives students the ability to learn through discussion with others, as well as not holding students back that may have reading difficulties.

Assessment:

Many activities have activity sheets that students have to complete, so these can be used as forms of assessment to check student understanding of the material. When meeting with small groups or individual students, I will also be making notes of student understanding – concepts they have grasped and concepts they need to further develop an understanding of.



Frog Life Cycles

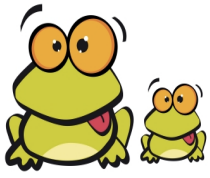
Use the book National Geographic FROGS! and the podcast to help you learn about how frogs are born and grow up.

1. Start listening to the podcast and follow along with the words and pictures in your book.

2. Use the list of words below, as you listen to the podcast, keep a tally of how many times you here those words

3. Use the book and the podcast to try to pick out three more words that you think are important about the life and growth of a frog, then answer the two questions underneath your tally chart.

4. Use your word tally to make a "Taxedo" word image.
   a) Go to the website www.tagxedo.com
   b) Click on the **Create** button
   c) Click the **Load** button and type the words from your word tally into the large box. Make sure you write the word as many times as you counted from the podcast.
   d) Once you have written your words, you can change the colour and the font any way you would like.
   e) You can even change the shape of your "taxedo" by clicking the **shape** button. (You may want to make it the shape of a frog!)



Life Cycle Vocabulary

Vocabulary Word	Tally
1. Life cycle	
2. Egg	
3. Tadpole	
4. Grow	
5. Froglet	
6. Hatch	
7. Frog	
8.	
9.	
10.	

1. Which words are repeated the most in the podcast?_____

_____

2. Why do you think these words are repeated more than others?

_____

_____

_____


Frog
egg
life
amphibian
cycle
frog
tadpole
grow
froglet
bigger
different
Copyright 2013
tagxedo.com

What will happen if you put 1 scoop of powder in the water?

What will happen if you put 2 scoops of powder in the water?

What will happen if you put 3 scoops of powder in the water?

Which one will grow the fastest? Which one will grow the most?

Write down your predictions on a piece of paper.

Follow these instructions to make your Insta-snow:

Step 1 – Take 3 cups and fill them half full with water

Step 2 – Put 2 drops of blue food colouring in the one cup.

Step 3 - Put 2 drops of red food colouring in another cup.

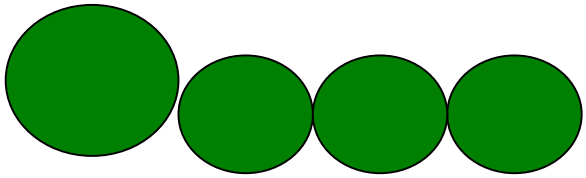
Step 4 - Put 2 drops of yellow food colouring in the other cup.

Step 5 - Add 1 scoop of insta-snow to the blue water, add 2 scoops to the red water and add 3 scoops to the yellow water.

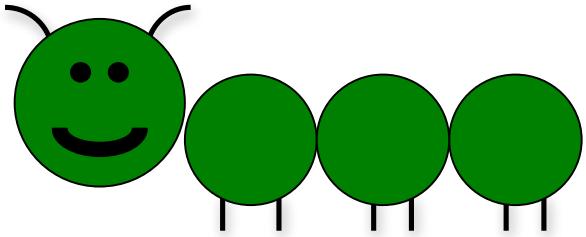
The Hungry Caterpillar

1. Watch *The Hungry Caterpillar* video on the computer.

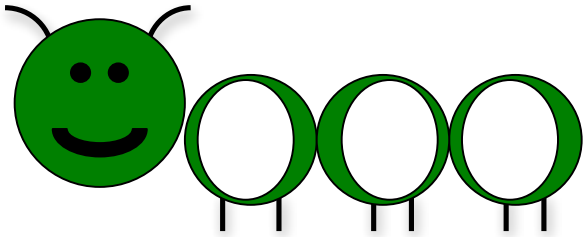
2. Make a caterpillar using the green circles.



Don't forget to give the caterpillar antennas, a face and legs!



Glue a white circle on each part of the body so you can write on it.



1. On the first circle, list the four different stages in the life of a caterpillar.

2. On the second circle, answer the question: If you met a caterpillar what would you ask it?

3. On the third circle, answer the question: How do you think the caterpillar would answer your question?

"Growth Chart"

Step 1:

Measure your height using the meter stick.

Step 2:

Write your height down beside your name in the chart.

Step 3:

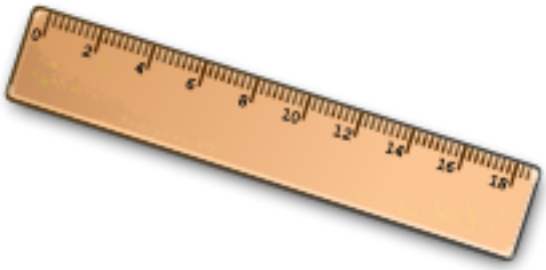
Measure how many centimeters your foot is. Write your answer on the chart.

Step 4:

Discuss the differences in people's height. Did the tallest person have the biggest feet? Why or why not? Who grew the fastest? How do you know?

Growth Chart

Name	Height (cm)	Foot (cm)



"Feeling" the Life Cycle

As animals go through different stages of the lifecycle, they often undergo changes at each stage. We often just see these changes with our eyes, but sometimes we can also notice the changes by using our sense of touch.

Starting at Stage 1, reach your hand in each box (no peeking!) and feel the object inside the box. Describe what you feel in each box on the lines below:

Stage 1:

_____

Stage 2:

_____

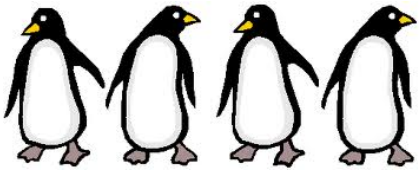
Stage 3:

_____

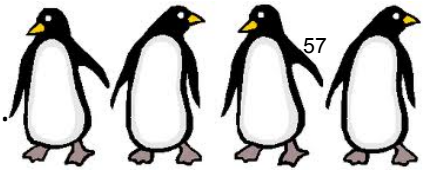
Stage 4:

_____

I predict this was the lifecycle of a _____.



If You Were a Baby Penguin..



1. Read about the emperor penguin using the iPad. (Use the National Geographic Website.)

Time to write a story!

Pretend that you are a baby penguin that moved with Fredericton:

- Would you be able to grow?
- What would you eat?
- Would it be too hot?

Write at least five sentences answering the questions.

Make sure to draw a picture of your penguin!

"Spin the Wheel"

Directions: Spin the animal wheel that is in the middle of the bulletin board. You will choose three items from the bucket that will help that animal grow best. Explain your choices to the other people at the center.

"Memory Game – Matching Animals"

1. Spread the cards out on the table face-down (so you cannot see the pictures).

2. Taking turns, turn over 2 cards at a time. If the baby animal matches the grown animal, keep the cards. If the cards do not match, turn the cards back over and it is the next person's turn.

3. Game continues until all the cards have been matched.

4. Look at your pairs of animals, and tell your group members what has changed and what has remained the same in the growth of each animal.